# **Adding online storytelling-based acceptance and commitment therapy to antidepressant treatment for primary care patients: A randomized clinical trial**

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**Abstract**

Depression is most often treated in primary care, where the prevailing treatment is antidepressant medication. Primary care patients with depression are less likely to be exposed to psychosocial interventions, despite evidence suggesting many of these treatments are effective. An example is acceptance and commitment therapy (ACT), a behavioral treatment for depression with a growing evidence base. A self-guided ACT intervention with a peer narrative (i.e., storytelling) format was developed with the intention of creating a treatment option for primary care patients that was more accessible than traditional psychotherapy. Titled *LifeStories*, the online program features videos of real individuals sharing coping skills for depression based on lived experiences and key ACT principles. A total of 93 primary care patients taking antidepressants were randomized to either continued antidepressant treatment alone or antidepressant treatment plus *LifeStories* for 4 weeks. There were no differences over time on depression severity and psychological inflexibility. However, *LifeStories* led to greater improvements in quality of life and increased patients’ interest in additional treatment compared to antidepressant medication alone.

**Clinical trial pre-registration: ClinicalTrials.gov (NCT04757961)**

*Keywords*: depression, antidepressants, acceptance and commitment therapy, storytelling, digital mental health, quality of life

## Introduction

A vast number of people suffer from depression globally, with recent estimates of 280 million sufferers, or 5% of the worldwide adult population (World Health Organization, 2023). A large portion of this group will seek relief from their primary care provider (PCP). In the United States, nearly three-quarters of individuals with depression seek treatment from a PCP rather than a psychiatrist, therapist, or other specialized mental health practitioner (Mojtabai & Olfson, 2008). Similar trends have been observed elsewhere, including several European countries (Jaffe et al., 2019), Brazil (Huang et al., 2014), and Iran (Kheirabadi et al., 2020).

Most patients treated for depression in primary care will be given an antidepressant medication as the first, and often, only, course of action. In a review of over 240,000 primary care patients diagnosed with depression, over 80% were given an antidepressant as a first-line treatment (Waitzfelder et al., 2018). This practice contributes to 13% of all adults in the U.S. using antidepressants in a given month, including a staggering 17% of all women (Brody & Gu, 2020). Despite advocacy for primary care physicians to reserve first-line pharmacotherapy for severe cases of depression (Park & Zarate, 2019), the continued widespread use of antidepressants indicates that this recommendation has yet to be adopted broadly.

Importantly, substantial increases in the number of treatment options available over time (e.g., types of antidepressants) has not led to a decrease in the overall prevalence of depression as would be expected (Ormel et al., 2022). Reviews of antidepressant trials have suggested a high placebo response except in cases of severe and chronic depression (Fournier et al., 2010; Ormel et al., 2022). Further, a recent review failed to find antidepressants effective for improving patient quality of life over a two-year period (Almohammed et al., 2022). In addition, when patients do start antidepressants and then their depression remits, they are at increased risk of relapse if they discontinue medication compared to those who remitted using other treatments (Hollon et al., 2019). This is important because an average 75% of primary care patients discontinue the antidepressant prescribed to them within six months (Larson et al., 2022).

It is clear that patients seeking relief from depression in primary care need effective and sustainable treatment options beyond antidepressants alone. Combining antidepressants with psychosocial treatments (e.g., cognitive behavioral therapies) is one treatment strategy that has been found to be effective (Cuijpers et al., 2020) and is sometimes preferred for those who fail to achieve maximal response from medication alone. Acceptance and commitment therapy (ACT; Hayes et al., 2011) is a cognitive behavioral therapy that has seen a growing evidence base for treating depression, including when adapted to online self-help (Cavanaugh et al., 2014; Spijkerman et al., 2016; Brown et al., 2016; French et al., 2017). Therefore, ACT may be a viable psychosocial treatment to combine with antidepressants. ACT is theorized to treat depression by increasing psychological flexibility, or the quality of mindfully noticing mental experiences in a non-judgmental way while choosing to engage in meaningful life activities. Promoting psychological flexibility for depression involves processes such as changing one’s relationship to depressive thought patterns, recognizing the impermanence of depressive episodes, and increasing engagement in activities that have been restricted by depression (i.e., behavioral activation).

Integrating nonpharmacological interventions into primary care settings is difficult due to barriers including staffing, cost, and reluctancy of patients to initiate psychosocial depression treatment (Waitzfelder et al., 2018). As an alternative, low-intensity and self-guided psychosocial interventions could function as a “doorway” to increase patients’ willingness to pursue more specialized psychological support for depression. This strategy may help to address the relatively low rate of primary care patients starting psychotherapy compared to only using antidepressants (Waitzfelder et al., 2018). There is also reason to suggest that self-guided treatments for depression can produce meaningful improvements in symptoms on their own (Karyotaki et al., 2015). However, self-guided interventions for depression may struggle in maintaining engagement with clients over time, with one review indicating that as high as 74% of patients do not fully complete treatment (Richards & Richardson, 2012). Given this trend, there is a need to consider how to make self-guided interventions engaging to patients as well as determine whether high adherence to these treatments is necessary to produce meaningful outcomes.

Incorporating peer narrative components could promote patient interest in low-intensity, self-guided behavioral interventions. Storytelling is a means of transmitting information that is uniquely engaging and ubiquitous across global cultures (Brown, 2004). Interventions featuring personal and memorable narratives, even if brief, may also serve to promote patients’ willingness to pursue more intensive and specialized support for depression. Storytelling-based treatments have been shown viable for issues as diverse as substance abuse recovery (Mancini, 2019), diabetes management (Njeru et al., 2015), and chronic health conditions (Gucciardi et al., 2019). ACT therapeutic processes such as flexible perspective taking, establishing coherence between one’s actions and values, and fostering a sense of self that is distinct from one’s transitory emotional experience may be supported through engagement with narratives (Davis et al., 2021).

*LifeStories* is a storytelling-based ACT video intervention designed for patients receiving only antidepressant treatment in primary care. The intervention was created by recording interviews with real primary care patients who recovered from depression using ACT principles and wished to share their personal stories to help others. The *LifeStories* program has been empirically evaluated in pilot feasibility trials (Gaudiano et al., 2017; Gaudiano et al., 2020) to assess the feasibility of delivering this intervention to primary care patients. With 11 patients in the first trial and 21 in the second, these initial studies were not sufficiently powered to detect differences between an intervention and control group. However, participants in both pilot studies rated *LifeStories* as engaging and useful for learning coping skills, and that they felt invested in the personal stories they heard (Gaudiano et al., 2017; Gaudiano et al., 2020). While these initial studies indicate the overall viability of *LifeStories*, it is necessary to understand the efficacy of adding this adjunctive treatment of depression symptomatology and general functioning as compared to the typical standard of care in primary care settings (i.e., antidepressant treatment alone) in a larger-scale trial. Further, it is important to understand whether exposure to a brief narrative intervention helps direct patients to additional, sustainable treatment options in order to address the high rate of patients coming to PCPs for depression (Park & Zarate, 2019).

An additive trial of *LifeStories* was conducted for depressed primary care patients currently taking antidepressants. We aimed to test whether *LifeStories* could produce an effect above and beyond the effects from antidepressant treatment alone to understand the intervention’s potential utility in primary care given that many patients are not willing or able to receive traditional psychotherapy. Thus, the current study compared the efficacy of *LifeStories* as an adjunct to antidepressant treatment (Med TAU+LS) compared to continued antidepressant treatment alone (Med TAU). The primary outcome was depression symptom severity, which we hypothesized would decrease more for patients assigned to the Med TAU+LScondition. Secondary outcomes were quality of life, psychological flexibility, and interest in additional treatment options for depression, all of which we hypothesized would increase more for participants in Med TAU+LS.

## Methods

**Participants**

A sample of 93 primary care patients were recruited who met the following criteria: ³ 18 years of age, residing in the U.S., fluent in English, currently taking a typical antidepressant medication prescribed by a PCP (confirmed via patient interview by asking which medication they were taking and who gave them the prescription), no changes to medication regimen in past six weeks, scoring a 10 or above (indicating moderate depression) on the Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001), not presently seeing a mental health specialist (e.g., psychiatrist, psychologist), reliable internet access, and interested in testing an online self-help program for depression. Participants were recruited via online advertising (e.g., Facebook), and flyers posted in the community and in local primary care offices.

Recruitment took place from August to December 2021, which was during the COVID-19 pandemic in the U.S. Since we recruited across the entire U.S., pandemic related restrictions varied based on where a participant resided, with no significant nationwide restrictions in place at the time. A common trend during the pandemic was the increased use of telehealth in primary care (Ward et al., 2022), including during surges related to the Delta and Omicron variants in late 2021. This trend limited our ability to recruit patients in person from clinics. However, increased acceptability of telehealth may have also promoted interest in our completely online intervention from patients not wishing to receive in person services.

**Study Design**

 An adjunctive randomized trial of *LifeStories* was conducted with a clinical sample of primary care patients already taking at least one antidepressant medication. To test the effect of *LifeStories* as an adjunctive to antidepressants, we used a pretest-posttest control group design. Following a baseline assessment for all participants, half were randomly assigned to use *LifeStories* in addition to continuing their medication, and half were randomly assigned to use only their medication with no psychosocial interventions for four weeks. Our study design was preregistered through ClinicalTrials.gov (NCT04757961). Furthermore, ethical approval for the study was granted by the university’s Institutional Review Board (Utah State University IRB Protocol #11523).

**Procedure**

CONSORT and TIDierR checklists for the study are provided as supplemental materials to clarify patient retention and intervention components, respectively. Interested participants completed an initial phone screening with the first author to confirm eligibility criteria and to ensure participants’ willingness to engage in study procedures. Eligible participants provided informed consent and completed the baseline assessment. All assessments (i.e., baseline, midtreatment at 2 weeks, posttreatment at 4 weeks) were administered via Qualtrics, a secure online survey platform. After finishing the baseline survey, participants were randomized by computer in blocks of six with a 3:3 allocation ratio to either antidepressant medication treatment as usual (Med TAU) or antidepressant medication treatment plus *LifeStories* (Med TAU+LS), with the allocation sequence concealed to the researcher. Participants in both groups were compensated $10 each for completing the midtreatment and posttreatment assessments.

Participants in the Med TAU+LS group received access to weekly online modules of *LifeStories* for a period of four weeks, via links sent to their email. Those in the Med TAU group were asked to not use self-help websites or books for four weeks, after which they were provided access to the *LifeStories* modules on the same weekly schedule as those in the Med TAU+LS group (following completion of the posttreatment survey). All participants were asked to continue their antidepressant medication use as directed by their PCP. Reminders to complete assessments were given to all participants via phone calls and email. Those in the Med TAU+LS group additionally received weekly email reminders for accessing the *LifeStories* intervention.

**The *LifeStories* Intervention**

For the present study, the original videos comprising *LifeStories* were assembled into an integrated online program that added interactive exercises following each episode, as well as features such as lesson summaries, the ability to write and save “Story Notes” (reflections on the relevance of lessons learned to users’ own lives), and between-session behavioral commitments that are set by the user after a series of guided prompts. Each episode contains two main 15-minute videos with an optional “bonus” videos of additional personal stories and advice. Participants received access to one episode per week.

Episode 1 focuses on introductions of storytellers and how they found new ways of coping with depression. In Episode 2, storytellers describe how clarifying and acting on their personal values helped them cope with periods of depression. Episode 3 teaches the process of psychological acceptance and fostering a nonjudgmental stance towards difficult thoughts and feelings. Lastly, Episode 4 illustrates how mindfulness practice can be utilized to cope with feelings of depression and also provides recommendations for seeking mental health services from a therapist. Gaudiano et al. (2017) presents more detailed descriptions of the content of each *LifeStories* episode and screenshots are included in supplemental materials to this paper.

In the pilot feasibility trial of *LifeStories*, participants completed an average of three out of four sessions and still reported the program as useful in managing their depression (Gaudiano et al., 2020). Therefore, we considered completing at least three sessions to be our target treatment dosage.

**Measures**

**Patient Health Questionnaire–9** (PHQ-9; Kroenke et al., 2001). The PHQ is a 9-item measure of depression symptom severity which asks respondents to report their frequency of depressive symptoms over the past two weeks, rated on a 4-point scale from 0 “not at all” to 3 “nearly every day.” The PHQ-9 is widely used as an assessment of depression in primary care settings, where it has been found to be reliable and valid (Mitchell et al., 2016). The PHQ-9 has additionally been used as an outcome measure in studies of other web-based interventions for depression (Lüdtke et al., 2018). The PHQ-9 was used to measure depression symptom severity at all assessment points. Internal consistency was acceptable in our sample (α = .70).

**Short Form Health Survey** (SF-12; Ware et al., 1996). The SF-12 is a 12-item measure of quality of life and general functioning. A mental health subscale assesses an individual’s level of positive mental health/vitality, social functioning, and emotional impairment in role functioning. A physical health subscale assesses for overall health status, chronic pain, and physical health impairment in role functioning. The SF-12 has shown good reliability and validity (Huo et al., 2018), and was correlated with other measures of quality of life as well as clinical symptoms in a sample of depressed patients (Saragoussi et al., 2018). Both subscale scores were assessed at all three timepoints in this study. Internal consistency for the SF-12 was acceptable in our sample (α = .79).

**Acceptance and Action Questionnaire-II** (AAQ-II; Bond et al., 2011). The AAQ-II is a 7-item measure of psychological inflexibility and experiential avoidance, the central theorized treatment targets in ACT. Items are rated on a 7-point scale ranging from 1 “never true” to 7 “always true.” The AAQ-II has been found to have adequate reliability and validity and has also been tested in primary care samples (McCracken & Velleman, 2010). The AAQ-II was used as a process measure at all assessment points in the study. Our sample showed good internal consistency for the AAQ-II (α = .88).

**Adherence.** Adherence to the program was assessed directly through the online platform, which collected data on participants’ completion of each portion of the program. In addition, at posttreatment, participants in the Med TAU+LS group were asked to rate their adherence to the homework exercises from *LifeStories* on a 7-point scale from “Did all recommended assignments” to “Did no recommended assignments” posttreatment, using a scale adapted from previous self-help studies (Abramowitz, Moore, Braddock, & Harrington, 2009).

**Satisfaction.** Participants in the Med TAU+LS group were also asked at posttreatment to rate their level of satisfaction with the *LifeStories* intervention using the System Usability Scale (SUS; Brooke, 1996). The SUS is a 10-item measure of program usability and satisfaction with established reliability and validity (Lewis, 2009). Internal consistency for the SUS was good in our sample (α = .87).

**Treatment Preferences.** As we were testing a novel psychosocial intervention against the standard treatment approach for depression in primary care (i.e., antidepressants), a secondary aim of this study was to understand patient preferences for treatment and whether these changed after being exposed to *LifeStories*. Therefore, we gave participants an adapted version of the General Help Seeking Questionnaire (GHSQ; Wilson, Deane, Ciarocchi, & Rickwood, 2005), which is a validated measure of help-seeking intentions from a variety of formal (e.g., psychologist, PCP) and informal (e.g., friends, family) supports. The likelihood of seeking treatment from a particular source is rated on a 7-point scale from 1 “extremely likely” to 7 “extremely unlikely.” The GHSQ was previously adapted for use in self-help studies (Levin et al., 2018) by adding options for self-guided/online treatment resources. In this study, we used the same adapted scale while additionally specifying that these questions pertained to participants’ likelihood of using these resources to help with their depression. The GHSQ was administered at baseline and posttreatment with each item examined individually by help-seeking source (e.g., mental health professional, psychiatrist, mobile app).

**Treatment Utilization.** At baseline, participants were asked which antidepressant medication(s) they are currently taking, current dosage, and how long they have been taking this medication. Similar questions were assessed at posttreatment to track any potential discontinuation of medication during the treatment period. Additionally, participants were asked “are you planning to see a mental health specialist (i.e., contacted or made an appointment)?” at posttreatment to improve psychosocial treatment acceptability and utilization.

**Analytic Plan**

 According to an a priori power analysis, a sample size of 85 would allow for adequate statistical power (0.80) to detect a medium effect size (0.60), which was chosen based on the most recent meta-analysis of online ACT treatments for depression (Sierra et al., 2018). A final sample of 93 participants was recruited to account for a predicted missing data rate of 10% based on the observed retention in previous studies of *LifeStories* (Gaudiano et al., 2017; Gaudiano et al., 2020). All variables were analyzed for skewness and kurtosis at all three timepoints, and all approximated normality without requiring transformation. All analyses were conducted using R (R Core Team, 2015). Rates of missing data were compared between the Med TAU and Med TAU+LS conditions to determine any group differences. Descriptive statistics on participant demographics were examined for baseline differences. Rates of adherence to *LifeStories*, both self-reported and extracted from program usage data, were reviewed. Overall program satisfaction was compared to established benchmarks. The effect of the *LifeStories* intervention was tested on the clinical outcomes of depression symptom severity, quality of life, and psychological flexibility by fitting a series of mixed effects models for each outcome over 3 time points (baseline, midtreatment, posttreatment) with the full intent-to-treat sample using the lmer() function in R (Kuznetsova et al., 2017). Estimated marginal means were examined for the best-fitting model on each outcome variable. For all mixed effects models, maximum likelihood was used for parameter estimates, which allows for an intent-to-treat analysis using all available data even when individual observations are missing at some timepoints (Grund et al., 2019).

 The only post-hoc analysis conducted in this study was a subgroup analysis of participants who completed at least one full session of *LifeStories*, which was added after observing overall low rates of program completion.

## Results

**Preliminary Results**

Participant demographics are presented in Table 1. The sample recruited was largely female (84.9%), white (86.5%), and non-Hispanic (90.3%), with an average age 44.9 years (*SD* = 14.3). Regarding medication use, 65 participants (69.9%) reported currently taking only one antidepressant, while 30.1% reported taking two or three. Data on treatment history also suggested that a notable portion of the sample used antidepressants continuously for years at a time. Out of the full sample, 40.9% of participants reported taking an antidepressant for longer than five years at some point. The most commonly prescribed antidepressants in our sample were escitalopram (18.3%) and fluoxetine (14.0%), followed by sertraline and citalopram (both 12.9%). Regarding other treatment history, a sizable majority of participants (84.9%) reported previous outpatient psychotherapy, 20.4% said they had previously received inpatient treatment, and 69.9% endorsed previous use of any type of self-guided mental health resource. Overall, the study sample was characterized by long-term use of antidepressants as well as high rates of previous treatment utilization.

Regarding assessment completion, 75.3% of participants completed midtreatment and 88.2% completed posttreatment (see Figure 1 for participant flow diagram). Completion rate was significantly different at midtreatment, with 61.7% of the Med TAU+LS group completing the midtreatment assessment compared to 89.1% of the Med TAU group (c2 = 7.98, *p* = .005). At posttreatment, however, assessment completion rates did not differ significantly (c2 = 1.55, *p* = .21).

No participants requested to be removed from the study at any point and no adverse events were reported. Therefore, it was assumed that all missing assessment points were lost to follow-up (i.e., the participant was unable to be reached through phone call and email reminders) versus the participant electing to drop out of the study.

**Program Adherence and Satisfaction**

A total of 68% completed at least one session of *LifeStories*, 64% completed at least two sessions, 49% completed at least three sessions (our target dosage), and 34% completed all four sessions. Additionally, according to self-report, participants reported completing 82.6% of within-session activities and 64.8% of between-session homework activities. Regarding program satisfaction, participants in the Med TAU+LS group endorsed an average SUS score of 85.1 (*SD*=15.6). This is considered above average based on a review of 500 studies using the SUS to measure program satisfaction in which the average score was 68 (Sauro, 2011). Furthermore, our average of 85.1 is within the top 10% of SUS scores from the same large sample, suggesting overall high satisfaction and usability with *LifeStories*.

**Outcome Analyses**

Between condition treatment effects were examined for depression symptom severity, physical health-related quality of life, mental health-related-quality of life, and psychological flexibility (see Table 2 for descriptive statistics of each outcome variable by timepoint). On all four outcomes, significant main effects for time were found across study conditions (see Table 3 for estimated marginal means and model fit indices for each outcome). All outcomes moved in the expected directions with the exception of physical health-related quality of life, which worsened slightly over time in both conditions.

The two-way interaction of time by condition was significant only for mental health-related quality of life (*p* = .003), but not for depression symptom severity, psychological flexibility, or physical health-related quality of life (all *p*s > .05). Participants who received *LifeStories* improved in mental health-related quality of life an average of 3.24 points more than those in the Med TAU condition (see Figure 2). This interaction was also examined in post hoc tests. Participants in the Med TAU+LS group saw large within-group effect size changes from baseline to posttreatment (*d* = 0.80, 95% CI [0.34, 1.25]) representing an increase in quality of life over treatment. In contrast, those in the Med TAU group experienced a small treatment effect for quality of life from baseline to posttreatment (*d* = 0.15, 95% CI [-0.27, 0.57]). Looking at between-condition comparisons, effect sizes were negligible between groups at midtreatment (*d* = 0.08, 95% CI [-0.40, 0.56]) but were medium at posttreatment, favoring the Med TAU+LS group (*d* = -0.51, 95% CI [-0.99, 0.04]). In sum, these results imply that participants in the Med TAU+LS group saw better gains in mental health-related quality of life compared to the Med TAU group, with the largest discrepancy being at the four-week mark.

Considering that around 32% of participants in the Med TAU+LS group did not complete a single full session of *LifeStories*, a post-hoc exploratory analysis was conducted in which only participants in the Med TAU+LS group who completed at least one session were included in mixed effects models. As in the full sample, the best-fitting model for each outcome was the model including the full time by group interaction. Results largely mirrored those from the full dataset, with significant main effects for time for all outcomes except physical health-related quality of life, and a significant time by condition effect for mental health-related quality of life only.

**Influence of Intervention on Help-Seeking Preferences**

Estimated marginal means from mixed effects models of changes in treatment preferences are presented in Table 4, divided by category of help-seeking. The first category examined was professional services, which included therapists, psychiatrists, primary care doctors, and phone/crisis helplines. A significant time by condition interaction was found for all four types of professional support (all *p*s < .05), with preferences for each option increasing between baseline and posttreatment in the Med TAU+LS group more so than the Med TAU group (see Figure 3).

 The second group of sources for depression support comprised those delivered in a self-guided format, including self-help books, websites, and mobile apps. A significant time by condition interaction was found for the likelihood of using a self-help book for depression, with participants in the Med TAU+LS having their likelihood of seeking support from this modality increase more than the Med TAU group over the intervention period (*p* = .022). Additionally, those in the Med TAU+LS group increased their likelihood of searching online for depression support more than the Med TAU group (*p* = .021). Time by condition effects for the likelihood of seeking help from a self-help website or mobile app were not significant.

Lastly, we assessed potential sources of support for depression from one’s family, social circle, or paraprofessionals. The time by condition interaction was significant only for seeking help from a friend, with an increase among those in the Med TAU+LS group (*p* = .041). There was not a significant time by condition interaction for changes in the likelihood of seeking help from other informal or paraprofessional sources of help. Finally, participants did not differ over time according to group in their likelihood of refusing help for depression (i.e., “I would not seek help from anyone”).

**Changes in Treatment Utilization**

Overall, there were minimal reported changes in antidepressant use during the study period. Two participants, both in the Med TAU group, reported stopping their medication. Six participants overall reported a change in the dose of their antidepressant over the study period, and one participant switched to using another antidepressant. Regarding actual plans to see a mental health provider, nine participants endorsed making arrangements by posttreatment (11.7%). Rates were nearly equal between groups, with four participants in the Med TAU+LS group (11.1%) and five in the Med TAU group (12.2%) reporting plans.

## Discussion

 The aim of this randomized trial was to determine if a storytelling-based ACT program, *LifeStories*, is effective as an adjunctive treatment for primary care patients taking antidepressants. Specifically, we sought to understand whether *LifeStories* is an efficacious additional treatment for depression by assessing changes in depression severity, quality of life, and psychological inflexibility. We also aimed to clarify if *LifeStories* can function as a “doorway” to more intensive and specialized depression treatments, such as working with a therapist or using additional self-help, by examining changes in treatment preferences. This would be important in showing that *LifeStories* serves as a brief and engaging introduction to ACT that can then be expanded upon for the long-term management of depression for primary care patients. Given the low rate of primary care patients initiating psychosocial treatments for depression despite their demonstrated effectiveness (Waitzfelder et al., 2018), strategies are needed to promote greater adaptation of these interventions.

**Feasibility and Acceptability of *LifeStories* among Primary Care Patients taking Antidepressant Medication**

 *LifeStories* users rated the program favorably on usability. This is promising data, suggesting that a series of therapeutic narrative videos can be effectively adapted to an online format with accompanying self-guided exercises. This proof-of-concept is particularly relevant to the development of self-guided ACT interventions. Two important aspects of ACT are that it draws on shared human experiences of suffering and that it is delivered in an experiential manner (Walser, 2019). These key features are emphasized by combining real patient narratives with interactive exercises to teach behavioral coping skills.

 Adherence to the *LifeStories* intervention was largely similar to previous trials of self-guided cognitive behavioral interventions for depressed primary care patients (Gilbody et al., 2015). Notably, however, we saw effects of the intervention on quality of life and help seeking interest despite only half of participants receiving our target dosage of three sessions and just over a third completing all four. This suggests that an effective dosage of *LifeStories* could be even lower for some patients. Our findings fit with the notion that, due to their engaging and immersive natures, storytelling based interventions may require a smaller dosage to produce meaningful impacts for depressed individuals. This may be particularly advantageous in primary care settings where it is difficult to promote long term engagement with psychosocial interventions.

**Effects of *LifeStories* on Depression Symptom Severity and Quality of Life**

*LifeStories* did not have a significant effect on the primary outcome of depression symptom severity, though the program did appear to improve mental health-related quality of life relative to antidepressants alone. This result adds to a growing body of evidence that psychosocial treatments for depression can produce meaningful improvements in patient quality of life (Kolovos et al., 2016) when antidepressants alone cannot. A recent large analysis of healthcare records in the United States found no effect of antidepressants on mental health-related quality of life over a two-year period (Almohammed et al., 2022). Furthermore, the fact that we did not observe depression symptom severity improving alongside quality of life may support the hypothesis that antidepressants prevent improvement beyond a certain level by maintaining low level depression through an iatrogenic effect (Ormel et al., 2022). In our study, we did not find significant differences regarding physical health-related quality of life, indicating that more medically focused aspects of quality of life may be less impacted by brief narrative interventions.

***LifeStories* as a “Doorway” to other Psychosocial Treatments**

An important secondary aim of the study was to determine if *LifeStories* could increase willingness to pursue additional, more intensive psychosocial treatments. As the intervention was designed to be brief and accessible, our intention was not to provide a complete treatment for depression, or one meant to entirely replace antidepressant use. Rather, our goal was to bolster the standard treatment in primary care by teaching basic psychological flexibility skills for depression in addition to providing patients with a “doorway” to further support. We found that participants who used *LifeStories* reported a general increase in their likelihood of seeking help for depression from a variety of sources, particularly specialized mental health practitioners. Individuals using only antidepressants, in contrast, reported a similar or decreased likelihood of help-seeking from professional sources from the beginning to the end of the study period.

Interestingly, *LifeStories* also seemed to promote willingness to seek depression support from a PCP. As our entire sample was prescribed an antidepressant from their PCP, they were already engaged in depression treatment from this source to an extent. What this finding may have captured, then, is an increased motivation to pursue additional support for depression in primary care. This could include consulting a doctor about their medication if they are dissatisfied with it or inquiring about alternative treatment options for depression. Patients’ comfort in discussing concerns about mental health with a PCP is often low (Heinz et al., 2021). That *LifeStories* may have helped to address some of these barriers to treatment-seeking is a promising sign.

We did not observe any meaningful changes in other measures of treatment utilization beyond self-reported interest. A small number of participants in both groups reported making actual plans to see a specialized mental health provider at the four-week posttreatment assessment. There are many potential practical barriers to obtaining additional treatment despite one’s interest level and the 4 week time frame was limited for assessing this as an outcome. Future iterations of *LifeStories* or similar narrative interventions could incorporate more direct ways of promoting treatment utilization, such as a tool for participants to search for providers in their area.

**Effects of *LifeStories* on Psychological Inflexibility**

 There was no indication that individuals using *LifeStories* improved more on psychological flexibility than those using antidepressants alone, which brings into question the theoretical validity of our intervention. It is possible that other ACT-relevant processes are more relevant to our storytelling intervention than general psychological flexibility, such as personal values and committed action, which would fit with our observed effect of *LifeStories* on quality of life (i.e., the program helped patients engage more actively in daily activities while being less encumbered by their depression). Future narrative-based interventions for depression could further emphasize valued living and use assessments that capture this process (e.g., Valuing Questionnaire; Smout et al. 2014). It is also possible that as a novel narrative-based intervention, *LifeStories* could have engaged processes of change that are less relevant to standard psychosocial interventions. These could have included narrative transportation or a feeling of emotional connection with the video storytellers (Davis et al., 2021). It would be valuable to test empirically the specific routes through which narrative interventions might impact on psychological health.

## Limitations

A few limitations should be noted which potentially limit the applicability of these findings to primary care patients broadly. Primarily, our assessment period for this study was only one month. While this allowed us to make inferences about the short-term effectiveness of *LifeStories*, we were not able to gain insights into long-term outcomes. It would be valuable to assess longitudinal outcomes for *LifeStories*, particularly utilization of other psychological services over time. While we observed a significant difference in users of *LifeStories* becoming more interested in various professional treatment options, there is a risk of expectancy bias using only a measure of preferences and not actual steps towards seeking treatment. We also did not assess for comorbid anxiety in our sample, which is common among depressed primary care patients (Zhang et al., 2019). Knowing whether the ACT skills taught in *LifeStories* reduce symptoms of anxiety as well as depression in primary care patients would further increase generalizability.

Another limitation of our study is that our non-significant results for psychological inflexibility could have been due to psychometric issues with the AAQ-II. It has been argued that the AAQ-II, designed as a unidimensional measure of psychological inflexibility, more accurately measures general distress, raising questions about construct and discriminant validity (Wolgast, 2014; Tyndall et al., 2019). An alternative measure, the CompACT (Francis et al., 2016), measures three separate dimensions of psychological flexibility (openness to experience, behavioral awareness, and valued action) has been shown to better capture process-level improvements in depression treatment compared to the AAQ-II (Rogge et al., 2019). Accordingly, future studies of ACT for depression in primary care should consider using a multidimensional measure of psychological inflexibility such as the CompACT.

Our findings may have also been affected by factors related to the COVID-19 pandemic. We were unable to establish a presence and recruit patients in local primary care clinics due to ongoing restrictions in medical settings (e.g., clinics only allowing patients in waiting rooms). For this reason, we recruited our sample through broad public advertising which likely contributed to a high degree of variation in our sample in terms of treatment (e.g., how engaged someone is in primary care services). At the same time, it is possible that increased acceptability of telehealth during the pandemic also bolstered our recruitment efforts by making patients more open to using an online program or not wanting to see a provider in person due to social distancing concerns. Therefore, is difficult to determine whether the COVID-19 pandemic had a net positive or negative effect on our implementation of *LifeStories*, and it will be important to test whether *LifeStories* can be effectively implemented more directly in primary care clinics.

 Lastly, the sample in our study was primarily non-Hispanic, white, and female, and does not reflect the diversity of primary care patients seeking treatment for depression. Recruiting more diverse patients samples would help clarify whether *LifeStories* is helpful for a broad swath of individuals, especially those who encounter systemic barriers to receiving adequate psychological support in primary care (Sanchez, 2019). Storytelling-based interventions possess an inherently humanizing quality and highlight the value of individual differences, and therefore warrant testing with more diverse patient groups.

## Conclusion

 Our study showed that a storytelling-based ACT intervention improved mental health-related quality of life in a sample of primary care patients taking antidepressants while also promoting interest in additional specialized care for depression. These changes were significant compared to individuals who were only taking antidepressants, the standard treatment approach for depression in primary care. We did not observe significant group differences in our primary outcome of depression symptom severity or psychological inflexibility. Further research should explore if *LifeStories* or other storytelling-based interventions produce meaningful improvements in these outcomes long-term compared to antidepressants.

 Additionally, *LifeStories* could be tested within a stepped-care model of depression treatment as a less invasive option that is given prior to initiating antidepressant treatment (van Straten et al., 2014). *LifeStories* may also help patients who are discontinuing antidepressant treatment to help mitigate remission effects, which are common (Hollon et al., 2019). Finally, *LifeStories* could be tested as a motivation-enhancing tool for primary care patients who are hesitant to pursue more intensive care despite the likelihood of them benefitting from it.

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