

Behavior change through automated e-mails: Mediation analysis of self-help strategy use for depressive symptoms

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Abstract

Objective: To evaluate whether automated e-mails promoting effective self-help strategies for depressive symptoms were effective in changing self-help behavior, and whether this improved depression outcomes.

Method: 568 adults with sub-threshold depression participated in a randomized controlled trial and provided complete data. A series of 12 e-mails promoting the use of evidence-based self-help strategies was compared with e-mails providing non-directive depression information. Depression symptoms were assessed with the Patient Health Questionnaire depression scale (PHQ-9) and use of self-help strategies was assessed at baseline and post-intervention. We hypothesized that those receiving the self-help e-mails would increase their use of evidence-based self-help and this would be associated with improvements in depression. Mediation analyses were conducted using a non-parametric bootstrapping procedure.

Results: Total use of the self-help strategies promoted in the e-mails significantly mediated the effect of the intervention on depressive symptoms ($B = -0.75$, $SE = 0.16$, 95% CI: -1.06 to -0.48). The direct effect of the intervention on depressive symptoms was much smaller and not significant when the mediation path was included. The majority of the individual strategies also had a significant indirect effect on depressive symptoms.

Conclusions: In adults with sub-threshold depression, automated e-mails based on behavior change principles can successfully increase use of self-help strategies, leading to a reduction in depressive symptoms.

Keywords: major depression, internet, self help techniques, behavior change, Primary Mental Health Prevention

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Many individuals believe that self-help techniques are effective for mental health problems (Jorm, et al., 2005). However, not all self-help techniques are helpful, and some may even be harmful (Morgan & Jorm, 2008). Promoting self-help strategies that have an evidence base for their effectiveness to members of the public with depression may help to reduce the population burden from depression (Jorm & Griffiths, 2006). There has been a call for preventive interventions for depression that go beyond face-to-face interventions that can be widely disseminated to have maximum impact at a population level (Muñoz, Cuijpers, Smit, Barrera, & Leykin, 2010).

Automated e-mails have been proposed as a method of delivering messages about effective self-help to individuals with mild depressive symptoms (Morgan, Jorm, & Mackinnon, 2011). E-mails have a wide reach and can be delivered cost-effectively, yet content can be tailored to the needs of individuals. Studies in adults not selected for having a mental disorder have shown that theory-informed health messages delivered as automated e-mail can change diet and physical activity behaviors (Plotnikoff, McCargar, Wilson, & Loucaides, 2005; Sternfeld, et al., 2009). However, it is not clear whether a similar approach could change behaviors in individuals with depressive symptoms, who may face greater barriers to behavior change due to the inherent nature of the disorder.

We recently evaluated the effectiveness of a series of automated e-mails (Mood Memos) promoting use of effective self-help strategies for depressive symptoms in a randomized controlled trial (RCT) (Morgan, Jorm, & Mackinnon, 2012). The e-mails encouraged recipients to engage in self-help strategies that had been endorsed by experts as likely to be helpful and feasible to implement for most people with sub-threshold depression (depressive symptoms that do not meet criteria for a diagnosis of depressive disorder).

Relative to a placebo control condition, the e-mails were effective in reducing depressive symptoms in adults with sub-threshold depression over a 6-week period. The study was not powered to detect prevention of transition to major depression, but the risk reduction was similar in magnitude to other depression prevention studies (Cuijpers, van Straten, Smit, Mihalopoulos, & Beekman, 2008).

The current paper aimed to evaluate whether the emails used in our trial changed reported self-help behavior, and whether this change in behavior was associated with depressive symptoms. This would clarify the intervention mechanism, and potentially strengthen the link between using emails as a way of changing coping strategies in order to improve depression. Identifying how or why a treatment works is important for several reasons, including the possibility of optimizing therapeutic change. Studies of treatment of depression with cognitive behavior therapy (CBT) have focused on the mediating effect of therapist variables, patient variables (e.g., negative cognitions) and the interaction between therapist and patient (e.g., therapeutic alliance) (Webb, Auerbach, & DeRubeis, 2012). Research into the role of CBT skill use is relatively rare (Hundt, Mignogna, Underhill, & Cully, 2012). There are also few studies on internet-based treatment for depression that have evaluated the mechanisms behind treatment effects (Mureşan, Montgomery, & David, 2012). An exception is a study by Warmerdam, van Straten, Jongsma, Twisk and Cuijpers (2010), which found that symptom reductions from online CBT were mediated by changes in dysfunctional attitudes, worrying, negative problem orientation and perceived control.

The primary hypothesis in this study was that overall use of the promoted self-help strategies would increase in the active group relative to the control group, and that this increase would mediate the effect of group assignment on depressive symptoms. We also wished to explore the effect of individual e-mails promoting particular strategies, but had no predictions as to which would be most effective.

Method

Participants

Participants were 568 adults with sub-threshold depression who completed the trial and for whom baseline and post-intervention data were available. Sub-threshold depression was defined as 2 to 4 symptoms of depression experienced more than half the days or nearly every day for two or more weeks, which had affected work, home, or social functioning. Participants were recruited online to the study website (www.moodmemos.com) from a variety of internet-based sources including Google advertising, and were screened for eligibility with the PHQ-9 (Kroenke, Spitzer, Williams, & Löwe, 2010). The study was promoted to those with mild depressive symptoms as a way of receiving expert information or coping advice about depression via email. There were few restrictions on participation other than age, country of residence, access to the internet, and current treatment (excepting maintenance antidepressant medication). Participants ranged in age from 18 to 78 ($M = 36.3$, $SD = 13.8$), 79% were female, 54% had a university education, 51% reported a history of depression, and 3.5% reported a history of bipolar disorder or psychotic disorder. Participants were residents of Australia (60.7%), the United Kingdom (21.7%), Canada (8.5%), the United States (5.8%), New Zealand (2.1%), and Ireland (1.6%).

Procedure

Participants were randomized to receive 12 active or control e-mails over 6 weeks by an automated system and had no interaction with a study therapist. The active e-mails promoted the use of the top 14 self-help strategies endorsed as effective and feasible by depression experts who were clinicians, researchers, or consumer advocates (see Table 1) (Morgan & Jorm, 2009). These strategies were identified using the Delphi consensus method (Jones & Hunter, 1995). Experts were presented with 282 strategies that had been proposed as helpful for depression in either the lay or scientific literature. Each strategy was rated for

its likely helpfulness for most people with sub-threshold depression over multiple rounds until consensus was reached. Endorsed strategies were largely lifestyle or psychosocial methods, with no supplements or herbal remedies endorsed. Strategies were also rated for how difficult they would be to carry out on average, taking into consideration effort, time and cost. The e-mails used a variety of techniques to encourage and persuade the recipient to engage in the self-help behaviors (Morgan, et al., 2011). Each e-mail included an explanation for a strategy, why it would work, tips on how it could be implemented, suggested solutions for implementation barriers, an appeal to commit to implementing the strategy with an example goal, and a reminder about previous strategies. The strategies were ordered in terms of their feasibility to be carried out as rated by the experts, with the most feasible strategy sent first. The control e-mails contained general information about depressive disorders (e.g., symptoms, prevalence, causes) and did not suggest any action. These e-mails were designed to control for non-specific effects related to receiving e-mails with depression-related content. As psychoeducation can improve depressive symptoms (Donker, Griffiths, Cuijpers, & Christensen, 2009), these emails were a stronger control than a waitlist or no-treatment condition.

Measures

Assessment of self-help strategy use and depressive symptoms occurred at baseline and at the end of the intervention (6 weeks post-baseline). All assessment was self-rated and undertaken on the Mood Memos website. Depression symptom severity at post-intervention was the primary outcome of the trial. This was assessed with the PHQ-9, which measures the frequency over the past two weeks of the nine Criterion A symptoms of DSM-IV Major Depressive Episode (Kroenke, et al., 2010). Scores range from 0 to 27 and cut-points of 5, 10, 15 and 20 represent mild, moderate, moderately severe and severe levels of depression. Self-help strategy usage was evaluated to test whether the Mood Memo e-mails led to any

change in self-help behavior. Participants rated how frequently they had used the 14 self-help strategies promoted in the Mood Memo e-mails for their depressive symptoms over the past month. Frequency of use was rated on a 5-category scale (*not at all, infrequently, moderately frequently, very frequently, don't know*).

Statistical Analyses

In the current study, it was hypothesized that use of the promoted self-help strategies would mediate the effect of the intervention on depression symptoms. Due to the large number of strategies to analyze as potential mediators, a principal components analysis was conducted on the frequency of use of the 14 self-help strategies promoted in the e-mails. This analysis was consistent with the strategies representing a single dimension. This total strategy use scale ranged from 0 to 42 and had good internal consistency (Cronbach's $\alpha = .78$, $N = 1,246$). Therefore, the primary analysis used this scale as a measure of overall uptake and use of the strategies promoted in the intervention. Secondary, exploratory analyses (described below), were conducted to evaluate the effectiveness of individual e-mails promoting particular strategies.

For the primary mediation analysis, group assignment was the independent variable (X), depression score at post-intervention was the dependent variable (Y), and total strategy use score at post-intervention was used as the mediator (M). The *total effect* of X on Y (denoted by c), can be expressed as the sum of the *direct effect* (denoted by c') and *indirect effect*, which is the product of the a and b paths (denoted by ab), such that $c = c' + ab$. Pre-intervention depression score and strategy use score were covariates (see Figure 1). The indirect effect of strategy use was estimated using the non-parametric bootstrapping procedure of Preacher and Hayes (2004). This procedure is an extension of the Sobel test (Sobel, 1982). The Sobel test and subsequent extension are regarded as superior to the causal steps method of Baron and Kenny (1986), because they formally test the significance of the

indirect path and often have greater statistical power. The bootstrapping procedure also yields more accurate estimates of the confidence intervals of the indirect effect than the Sobel test, and was carried out using the *MEDIATE* macro for SPSS (Preacher & Hayes, 2008). The indirect effect was bootstrapped with 2000 replications, yielding a point estimate of the population value of the indirect effect, its standard error, and 95% confidence interval (CI). The point estimate is interpreted as an unstandardized regression coefficient, which is the association between the mediator and post-intervention depression scores, after adjusting for the effects of group assignment and covariates. The indirect effect is statistically different from zero at $p < .05$ (two-tailed) if zero is not contained in the 95% confidence interval.

To explore the effect of individual self-help strategies as mediators, a series of univariate mediation analyses were then conducted. A separate mediation model was fitted to each strategy following the procedure described above, but the mediating variable was usage of the self-help strategy at post-intervention, rather than total strategy use.

A multiple mediation analysis was also conducted to explore the *unique* effects of usage of each self-help strategy, accounting for the use of other strategies. In this context, the specific indirect effect of each mediator is the effect on depression controlling for the other mediators in the model (Preacher & Hayes, 2008). As self-help strategies that overlap in content could attenuate specific indirect effects, correlations between use of each promoted self-help strategy at post-intervention were examined. These indicated that multicollinearity was not a substantial problem, with most correlations in the range of $r = .2$ to $r = .3$, and none greater than $r = .65$. The model included the pre-intervention usage of each strategy and pre-intervention depression score as covariates, and was based on 2000 bootstrapped samples. Due to the large number of predictors and covariates in the model, only strategies that had a significant indirect effect in the univariate mediation analyses were included in the multiple mediation analysis.

Results

Table 1 presents the means and standard deviations of depressive symptoms, frequency of use of all self-help strategies combined and frequency of use of each strategy individually at baseline and post-intervention. Mean scores on the PHQ-9 at baseline were in the mild to moderate severity range (Kroenke, et al., 2010). All self-help strategies had potential for improvement in mean usage.

The total strategy use score was examined first as a potential mediator, to test the overall effect of the use of the self-help strategies on depressive symptoms (see Table 2). The indirect effect of the total strategy use score was significant at $p < .05$. The direct effect (c' path) of the intervention on depression symptoms was much smaller and not significant when the mediation path was included, implying that self-help strategy usage completely mediated the effect of the intervention on depression symptoms. Depression scores would be expected to decrease by 0.75 points for those in the active group relative to the control group, indirectly through self-help strategy usage.

Next, the indirect effects of individual self-help strategies on depression symptoms were explored. Table 2 presents the estimates of the indirect effect and 95% CI for each promoted self-help strategy. Eight of the fourteen strategies significantly mediated the effect of the intervention on depression symptoms. Table 2 also shows the association between group assignment and use of each strategy post-intervention (controlling for use at baseline) in the ' a path' column, and the association between use of each strategy and depressive symptoms (controlling for group assignment) in the ' b path' column. Some strategies (e.g., a healthy, balanced diet) show a significant association with depressive symptoms (b path), but were not significantly associated with group assignment, indicating the e-mails were not effective at increasing strategy use. Conversely, some strategies (e.g., trying methods to improve sleep) show a significant association with group assignment, but no significant

association with depressive symptoms, indicating that the e-mails were effective at increasing strategy use but that this did not affect depression.

Mediators that were significant individually were then entered into a multiple mediation analysis. This explored the unique effects of each strategy, controlling for usage of the other strategies. Table 3 presents the estimates of the specific indirect effect and 95% CIs for each of these strategies. The only strategies that had a significant unique effect were *you made sure you got out of the house for at least a short time each day* and *you engaged in an activity that gave you a feeling of achievement*. These two strategies also had the largest indirect effects in the simple mediation analyses.

Discussion

The central precept of the Mood Memos study was that the active e-mails would lead to an increase in usage of the promoted strategies, relative to the control group, and that this increase would improve depressive symptoms. This hypothesis was supported for use of the strategies overall. The total use of the promoted self-help strategies completely mediated the effect of the intervention on depression symptoms. This finding provides strong support for the premise that the intervention worked as intended and that the intervention led to behavior change, which in turn, led to improved depressive symptoms. Exploratory analyses of which strategies were more successful mediators showed that the majority had some indirect effect, with the strongest effects from *you made sure you got out of the house for at least a short time each day* and *you engaged in an activity that gave you a feeling of achievement*. These results confirm previous studies that show health behavior change is possible through automated e-mails (Plotnikoff, et al., 2005; Sternfeld, et al., 2009).

The messages in the intervention were originally conceived to educate participants about which self-help strategies are effective, which would lead to their use. Though this may have been the case for some participants, some of the strategies were already well

known and used prior to the intervention. This could be related to the characteristics of the particular sample, such as the high level of education and proportion reporting a history of depression. However, despite participants already knowing which strategies should be used for depression, the Mood Memo e-mails were still effective in increasing their use. A content analysis of participants' written feedback post-intervention suggested that the e-mails might have been effective because they prompted or reminded participants to use the strategies. For example, one participant wrote, *"For me the arrival of the e-mails helped to trigger a 'health priority response' and motivated me to exercise or do small enjoyable things placing myself on top of the family"*, and another wrote, *"It was very helpful. I suppose I knew the things I should do, but somehow, having someone tell you to do those things sort of spurred me on"*. This is consistent with research showing that prompts and reminders to engage in health behaviors can improve weight loss and physical activity (Fry & Neff, 2009). Though each e-mail prompted the use of a different strategy, they all focused attention on taking action for the participant's depression symptoms. Thus, the e-mails may have provided a 'cue to action', which the Health Belief Model predicts is one component needed for behavior change to occur (Becker, 1974).

Not all of the e-mails were successful in changing self-help behavior or improving depressive symptoms. Ideally, it was hoped that the e-mails would promote strategies that were easy to implement, would increase in use, *and* be helpful for depressive symptoms. Lack of change in usage or effect on depression could be due to several factors. The content of the e-mails may have been ineffective in prompting behavior change, the strategies may have been intrinsically too hard to implement, the strategies may not have been helpful in reducing depression even when implemented, or some combination of these factors. The strategy that was the strongest mediator of group assignment on depressive symptoms, (*you made sure you got out of the house for at least a short time each day*) was promoted in the

first e-mail and was thought to be the most feasible to implement by experts. Therefore, its large increase in usage may have been a function of its inherent ease of implementation, or because it was the first e-mail delivered, so it received the most attention from participants, was read the most, and had the longest opportunity to be implemented. The second largest mediator was *you engaged in an activity that gave you a feeling of achievement*. While this was not one of the strategies that increased the most in usage, it appears that this strategy may have been particularly helpful for those individuals who did use it. Of note is that the four strategies that were the largest mediators of group assignment on depressive symptoms in the univariate mediation analyses were all related to behavioral activation, which is an effective treatment for depression (Mazzucchelli, Kane, & Rees, 2009). Behavioral activation is usually delivered as a component of CBT, including web-based CBT programs for depression (Richards & Richardson, 2012). However, the rise in adoption of smartphones has led to researchers developing behavioral activation treatments delivered by smartphones, which integrate more readily into users' everyday lives (Ly, Carlbring, & Andersson, 2012).

In order for the strongest conclusions to be drawn from mediation analyses, evidence of a causal path via the mediating variable is required. In many studies including the current trial, this would come from demonstrating that change in the mediator occurred prior to the change in the dependent variable. While self-help strategy use must have occurred prior to the time it was reported, the report itself and assessment of depressive symptoms took place on the same occasion. If mood state post intervention were to have influenced reporting of strategy use or if earlier changes in mood led to changes in strategy use, the mechanism observed could reflect the effect of depression on strategy use. However, our mediation analyses, as implemented using the **MEDIATE** macro, controlled for mood state at baseline. To seriously invalidate our conclusions, any mechanism involving recall bias would have needed to act differentially, with depression having a greater effect on recall of strategy use

in the control group compared to the active group. Refinement in collection of information about strategy use, such as with ecological momentary assessment (EMA), may help to address data collection issues related to retrospective recall, as EMA allows current mood state and activity to be assessed in real time at fixed or random points during the day (Wenze & Miller, 2010). EMA is particularly suitable for smartphone-delivered applications, and could afford greater tailoring of strategy messages in response to mood and activity patterns. However, EMA does have its own limitations, such as high user burden and issues around the privacy and confidentiality of data collected.

The mean difference in improvement of depressive symptoms between conditions was small, but should be considered against the low scores at baseline and limited opportunity for improvement, the small effect sizes typically encountered in prevention research (Horowitz & Garber, 2006), and the low intensity of the intervention, which was designed for broad dissemination and impact at the population level.

In conclusion, automated e-mails utilizing behavior change principles can successfully change behavior in the use of self-help strategies for depressive symptoms. Furthermore, the use of evidence-based self-help strategies can reduce depressive symptoms in adults with sub-threshold depression.

Acknowledgments

This research was supported by a National Health and Medical Research Council Postgraduate Scholarship (567056), a Sidney Myer Health Scholarship, and an NHMRC Australia Fellowship. Orygen Youth Health Research Centre receives funding from the Colonial Foundation. The funding sources had no role in the study design, collection, analysis or interpretation of data, in the writing of the report, and in the decision to submit the paper for publication. Thanks to the working group of Sarah Bouchier, Laura Hart, Claire

Kelly, Betty Kitchener, and Siobhan Ryan. Thanks to David Jahshan for programming assistance with PHP and MySQL. Thanks to the websites and organisations that assisted with recruiting participants to the study.

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Figure 1. Model of mediation pathway of group assignment on post-intervention depression scores with post-intervention total strategy use as the mediator, and pre-intervention total strategy use and pre-intervention depression as covariates.

Table 1.

Means and Standard Deviations of Depressive Symptoms, Total Strategy Use, and Use of Each Self-Help Strategy at Baseline and Post-Intervention

Measure	Baseline		Post	
	Active	Control	Active	Control
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
PHQ-9 score	10.39 (1.92)	10.37 (1.94)	7.45 (4.66)	8.30 (4.93)
Total strategy use	17.8 (6.64)	18.1 (6.41)	22.0 (7.06)	19.15 (6.89)
You made sure you got out of the house for at least a short time each day	1.97 (1.02)	2.01 (1.00)	2.48 (0.77)	2.09 (0.97)
You tried to remain involved in purposeful activities for at least a small part of every day	1.87 (0.96)	1.80 (0.97)	2.19 (0.83)	1.90 (0.93)
You rewarded yourself for reaching a small goal	0.74 (0.77)	0.91 (0.92)	1.31 (0.99)	1.02 (0.97)
You ate a healthy, balanced diet	1.91 (0.93)	1.87 (0.86)	2.04 (0.85)	2.03 (0.87)
You made sure you got enough sleep at night and had a bed time and rising time that varied little from day to day	1.37 (1.03)	1.48 (1.05)	1.80 (0.96)	1.64 (0.97)
You tried methods to improve your sleep, such as not napping during the day, avoiding caffeine and alcohol before bedtime, and making your	1.08 (1.05)	1.02 (1.05)	1.48 (1.10)	1.06 (1.06)

bedroom as restful as possible

You did something you enjoy 1.82 (0.74) 1.85 (0.76) 2.09 (0.75) 1.99 (0.76)

You engaged in an activity that gave 1.35 (0.87) 1.36 (0.84) 1.71 (0.81) 1.53 (0.87)

you a feeling of achievement

You talked over problems or 1.20 (1.00) 1.23 (1.05) 1.37 (1.05) 1.22 (1.08)

feelings with someone who is

supportive and caring

You engaged in exercise or physical 1.58 (0.95) 1.47 (0.93) 1.76 (0.99) 1.52 (0.97)

activity

You made a list of strategies that 0.55 (0.85) 0.56 (0.80) 0.88 (0.95) 0.68 (0.94)

have worked in the past for

depression and used them

You let family and friends know 1.01 (0.94) 1.03 (1.02) 1.11 (1.03) 1.05 (1.01)

how you are feeling so that they are

aware of what you are going through

You enlisted a trusted friend or 0.85 (1.00) 0.98 (0.99) 1.11 (1.01) 0.93 (0.97)

relative to help you get out and

about or do activities

You learnt relaxation methods 0.60 (0.87) 0.56 (0.84) 0.74 (0.92) 0.53 (0.81)

Table 2.

Bootstrapped point estimates (B) and confidence intervals (CIs) for the indirect effects of each self-help strategy as univariate mediators of intervention group on depression symptoms

Strategy	indirect (ab) path			a path			b path			c path			c' path		
	B	SE	95% CI	B	SE	p	B	SE	p	B	SE	p	B	SE	p
Total use of all strategies	-0.75*	0.16	-1.06 to -0.48	3.05	0.48	<.0001	-0.25	0.03	<.0001	-0.87	0.40	0.029	-0.12	0.39	0.760
You made sure you got out of the house for at least a short time each day	-0.59*	0.15	-0.89 to -0.33	0.40	0.07	<.0001	-1.48	0.24	<.0001	-0.88	0.40	0.028	-0.29	0.40	0.468
You tried to remain involved in purposeful activities for at least a small part of every day	-0.22*	0.09	-0.43 to -0.07	0.27	0.07	<.001	-0.84	0.25	0.001	-0.86	0.40	0.032	-0.64	0.40	0.113
You rewarded yourself for reaching a small goal	-0.28*	0.10	-0.50 to -0.10	0.38	0.08	<.0001	-0.75	0.22	0.001	-0.95	0.40	0.019	-0.66	0.41	0.105
You ate a healthy, balanced diet	0.01	0.11	-0.19 to 0.23	-0.01	0.06	0.885	-1.63	0.26	<.0001	-0.85	0.40	0.035	-0.86	0.39	0.026
You made sure you got enough sleep at night and had a bed time and rising time that varied little from day to day	-0.17*	0.08	-0.35 to -0.03	0.20	0.07	0.009	-0.88	0.22	<.001	-0.83	0.40	0.037	-0.66	0.40	0.096
You tried methods to improve your sleep, such as not napping during the day, avoiding caffeine and alcohol before bedtime, and making your bedroom as restful as possible	-0.07	0.09	-0.25 to 0.09	0.40	0.08	<.0001	-0.18	0.20	0.371	-0.72	0.40	0.072	-0.65	0.41	0.112
You did something you enjoy	-0.25	0.14	-0.52 to 0.01	0.11	0.06	0.061	-2.28	0.27	<.0001	-0.88	0.40	0.028	-0.63	0.38	0.097
You engaged in an activity that gave you a feeling of achievement	-0.30*	0.12	-0.53 to -0.09	0.19	0.07	0.005	-1.61	0.25	<.0001	-0.82	0.40	0.040	-0.52	0.39	0.179
You talked over problems or feelings with someone who is supportive and caring	-0.09*	0.06	-0.22 to -0.00	0.16	0.08	0.040	-0.57	0.21	0.008	-0.87	0.40	0.029	-0.78	0.40	0.050
You engaged in exercise or physical activity	-0.21*	0.09	-0.39 to -0.04	0.17	0.07	0.011	-1.19	0.24	<.0001	-0.88	0.40	0.028	-0.67	0.39	0.088

You made a list of strategies that have worked in the past for depression and used them	-0.10	0.07	-0.25 to 0.00	0.20	0.07	0.005	-0.51	0.23	0.027	-0.92	0.40	0.020	-0.82	0.40	0.040
You let family and friends know how you are feeling so that they are aware of what you are going through	-0.03	0.04	-0.10 to 0.04	0.07	0.07	0.376	-0.38	0.23	0.092	-0.88	0.40	0.027	-0.86	0.40	0.031
You enlisted a trusted friend or relative to help you get out and about or do activities	-0.12*	0.07	-0.28 to -0.02	0.24	0.07	0.001	-0.51	0.23	0.026	-0.84	0.40	0.037	-0.72	0.40	0.075
You learnt relaxation methods	-0.09	0.06	-0.22 to 0.02	0.19	0.06	0.002	-0.50	0.28	0.072	-0.88	0.40	0.029	-0.78	0.40	0.053

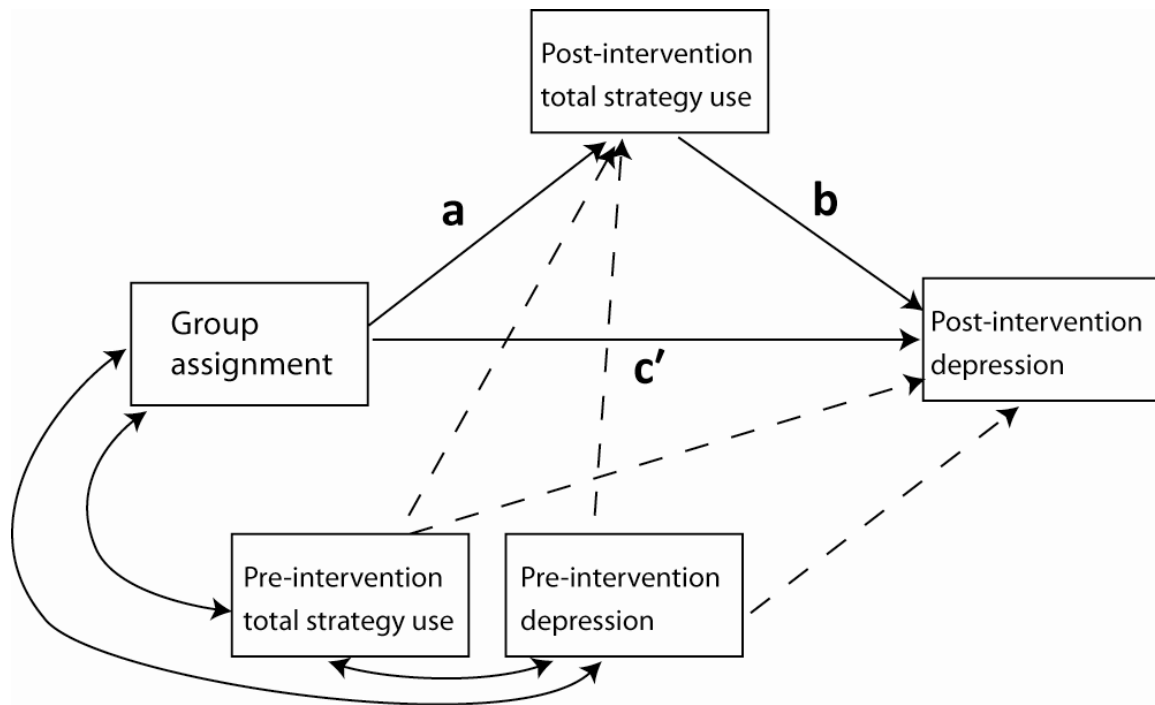
Note. * indicates significant at $p < .05$

Table 3.

*Bootstrapped point estimates (B) and confidence intervals (CIs) for the total and specific indirect effects of self-help strategy usage as multivariate mediators of intervention group on depression symptoms**

Strategy	B	SE	95% CI
You made sure you got out of the house for at least a short time each day	-0.36	0.13	-0.66 to -0.12
You tried to remain involved in purposeful activities for at least a small part of every day	-0.03	0.09	-0.22 to 0.16
You rewarded yourself for reaching a small goal	-0.04	0.09	-0.21 to 0.15
You made sure you got enough sleep at night and had a bed time and rising time that varied little from day to day	-0.06	0.05	-0.19 to 0.02
You engaged in an activity that gave you a feeling of achievement	-0.19	0.09	-0.39 to -0.04
You talked over problems or feelings with someone who is supportive and caring	-0.03	0.05	-0.14 to 0.06
You engaged in exercise or physical activity	-0.06	0.05	-0.17 to 0.01
You enlisted a trusted friend or relative to help you get out and about or do activities	0.01	0.06	-0.11 to 0.14

Note. *Total effect $B = -0.80$, $SE = 0.41$, $p = .055$





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Title:

Behavior change through automated e-mails: Mediation analysis of self-help strategy use for depressive symptoms

Date:

2013-02-01

Citation:

Morgan, A. J., Mackinnon, A. J. & Jorm, A. F. (2013). Behavior change through automated e-mails: Mediation analysis of self-help strategy use for depressive symptoms. BEHAVIOUR RESEARCH AND THERAPY, 51 (2), pp.57-62. <https://doi.org/10.1016/j.brat.2012.11.002>.

Publication Status:

Accepted manuscript

Persistent Link:

<http://hdl.handle.net/11343/41830>