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Research report

Predictors and moderators of response to internet-delivered Interpersonal Psychotherapy and Cognitive Behavior Therapy for depression

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ABSTRACT

Background: By identifying which predictors and moderators lead to beneficial outcomes, accurate selection of the best initial treatment will have significant benefits for depressed individuals.
Method: An automated, fully self-guided randomized controlled internet-delivered noninferiority trial was conducted comparing two new interventions (Interpersonal Psychotherapy [IPT; $n=620$] and Cognitive Behavioral Therapy [CBT; $n=610$]) to an active control intervention (MoodGYM; $n=613$) over a period of 4 weeks to spontaneous visitors of an internet-delivered therapy website (e-couch). A range of putative predictors and moderators (socio-demographic characteristics [age, gender, marital status, education level], clinical characteristics [depression/anxiety symptoms, disability, quality of life, medication use], skills [mastery and dysfunctional attitudes] and treatment preference) were assessed using internet-delivered self-report measures at baseline and immediately following treatment and at six months follow-up. Analyses were conducted using Mixed Model Repeated Measures (MMRM).
Results: Female gender, lower mastery and lower dysfunctional attitudes predicted better outcome at post-test and/or follow-up regardless of intervention. No overall differential effects for condition on depression as a function of outcome were found. However, based on time-specific estimates, a significant interaction effect of age was found. For younger people, internet-delivered IPT may be the preferred treatment choice, whereas older participants derive more benefits from internet-delivered CBT programs.
Limitations: Although the sample of participants was large, power to detect moderator effects was still lacking.
Conclusions: Different e-mental health programs may be more beneficial for specific age groups. The findings raise important possibilities for increasing depression treatment effectiveness and improving clinical practice guidelines for depression treatment of different age groups.
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1. Introduction

The effectiveness of Cognitive Behavioral Therapy (CBT) and Interpersonal Psychotherapy (IPT) have been well established (Cuijpers et al., 2011a, 2011b). Both have been found to be similarly effective in reducing depressive symptoms (Cuijpers et al., 2011a). However, less is known about who will benefit from therapy, and who will not. Even when two treatments are found to be equally effective in reducing depressive symptoms, individual characteristics may influence treatment outcome. Predictors (pre-treatment variables which predict depressive outcome in all treatment groups; Kraemer et al., 2002) and moderators (pre-treatment variables identifying which individuals are more likely to benefit from a particular treatment; Kazdin, 2007) are important to identify for several reasons. By identifying which characteristics of an individual predict the outcome of a specific treatment, a better match of treatment to the individual characteristics is achievable (Cuijpers et al., 2012; Simon and Perlis, 2010). Hence, this might contribute considerably to improvement of available

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treatments (Hamburg and Collins, 2010; Katsanis et al., 2008; Topol and Lauer, 2003). Knowledge about predictors and moderators of treatment outcome improves clinical decision about treatment (Andersson et al., 2008; MacKinnon, 2012), which has flow on effects to lower costs, reduce time in therapy, and enhance implementation and dissemination of depression treatment in the community. Furthermore, moderator analyses can detect whether a lack of intervention effect may be attributable to the intervention having opposite effects for different subgroups (Kraemer et al., 2006; MacKinnon, 2012).

1.1. Predictors of face-to-face depression interventions

Previous research has indicated that age (Fournier et al., 2009), pre-treatment level of dysfunctional attitudes (Blatt et al., 2010; Bulmash et al., 2009; Driessen and Hollon, 2010; Jacobs et al., 2009; Ravitz et al., 2011; Simons et al., 1984; Thase et al., 1991), and pre-treatment depression severity (Driessen and Hollon, 2010) may be predictors in response to traditional IPT and/or CBT. However, none of these studies has been designed to examine these predictors, and are based on post-hoc analyses.

1.2. Moderators of face-to-face depression interventions

The limited evidence on moderators suggests that being married moderated treatment outcome favorably in Cognitive Therapy (CT) compared to IPT whereas non-married people performed better in IPT compared to CT (Barber and Muenz, 1996). Barber and Muenz (1996) also found CBT superior to IPT for patients with avoidant personality traits and IPT superior to CBT for patients with obsessive personality traits. Furthermore, results from a clinical trial of IPT vs. CBT for depression suggested that subjects with more severe depression performed better with CBT (Luty et al., 2007) and those with avoidant and schizoid personality disorder symptoms predicted poorer response to IPT but not to CBT (Joyce et al., 2007).

1.3. Predictors of internet-interventions for depression

Immediately accessible and less costly, internet-delivered interventions may offer a valuable alternative to face-to-face therapy. Previous studies and meta-analyses have demonstrated unguided Internet-delivered self-help interventions to be effective for common mental disorders, with a pooled effect size of 0.28, but dropout rates are high (Cuijpers et al., 2011c). Internet-delivered CBT and IPT self-help interventions for depression are shown to be effective (Cuijpers et al., 2010; Donker et al., 2013) and guided self-help has shown to be as effective as face-to-face therapy (Cuijpers et al., 2010), but it may be that other processes are responsible for therapeutic change compared to face-to-face treatment. In the few internet-delivered CBT depression mechanism studies, the results have been inconclusive. For example, low pre-treatment illness severity and short-term improvement on clinical variables predicted better depression outcome (De Graaf et al., 2010), and Andersson et al., (2005) found that the number of previous depression episodes predicted poorer treatment response at six months follow-up. However, several studies have reported that higher pre-treatment depression scores predicted better internet-delivered CBT outcome (Button and Wiles, 2011; Spek et al., 2008; Warmerdam et al., in press), whereas in another study, pre-treatment depression score was not associated with internet-delivered CBT outcome (Proudfoot et al., 2003). Spek et al. (2008) showed that female gender predicted better outcome for Internet-delivered CBT for depression. Marital status (being divorced, widowed or separated) was also associated with greater internet-delivered CBT treatment response (Button and Wiles, 2011). Education level, age or depression history did not influence treatment outcome for internet-delivered CBT for depression (Button and Wiles, 2011).

1.4. Moderators of internet-interventions for depression

Moderator research of internet-delivered treatment for depression is sparse. One study found that those scoring higher on the altruism personality characteristic performed better in group CBT compared to internet-delivered CBT (Spek et al., 2008). Another study (Warmerdam (in press) Warmerdam et al., in press) found no moderators in their internet-delivered CBT study.

Given the paucity in mechanism research for internet-delivered interventions for depression, and IPT in particular, the aim of this study was to identify predictors and moderators for participant's treatment outcome of internet-delivered IPT and CBT. We hypothesized that baseline characteristics (e.g. gender, age, educational level, marital status, baseline depression level, skills, and previous depression) would moderate or predict treatment effects.

2. Methods

2.1. Participants and procedure

The current study is a secondary analysis of a previously outcome study (Donker et al., 2013), in which the details of the participants and procedure have already been described. In short, this automated, three-arm, fully self-guided internet-delivered noninferiority trial compared two new interventions (IPT-e-couch and CBT e-couch) to an active comparator intervention (MoodGYM) for depressed individuals. The trial was designed within a noninferiority framework. Noninferiority trials are used when there is clear evidence of efficacy for an existing standard treatment, such that it is ethically unacceptable to employ a placebo or inactive control group (Pocock, 2003) and when a new treatment is hypothesized to have comparable, but not necessarily superior, effectiveness to the established intervention (Mascha and Sessler, 2011). There was no specific promotion for the trial. Individuals were spontaneous visitors from around the world to an automated internet-delivered program (e-couch). The e-couch website is well known and promoted in communities around the world as a free and accessible source of personal self-help. Participants aged 18 years or older who gave informed consent and were not currently receiving treatment for depression by a mental health specialist were included in the study. Individuals with suicide intention or those who scored above 27 (95th percentile or higher) on the CES-D at baseline, were immediately provided with an information page containing advice about obtaining appropriate professional help, including emergency help. They could, however, continue to participate in the study. Study participants were randomly assigned to MoodGYM, CBT or IPT. We minimized exclusion criteria to increase generalizability of results. Excluded were health professionals treating people with depression/anxiety, researchers reviewing depression/anxiety sites, or students studying anxiety or depression as part of a college or university course. Individuals who were excluded from the study were directed to the public version of the e-couch program. Ethical approval for the study was provided by the Human Research Ethics Committee of the Australian National University (ANU).

2.2. Interventions

All programs were offered over 4 weeks. Users were required to complete the modules in order. Participants were able to revisit previous pages of the modules and scores of previous assessments,

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