Research paper

Comprehensive self-control training benefits depressed college students: A six-month randomized controlled intervention trial

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ABSTRACT

Background: Depressive disorder was associated with dysfunctional self-regulation. The current study attempted to design and test a comprehensive self-control training (CSCT) program with an overall emphasis on behaviral activation in depressed Chinese college students.
Methods: Participants included 74 students who had diagnosed with major depression, they were randomly assigned to one of the two groups: intervention group ($n = 37$), and control group ($n = 37$). The intervention participants received an eight-week CSCT and four-month follow-up consolidation program, as compared to the control group who received only pre-post-and-follow-up measurements. All participants measured Beck Depression Inventory (BDI-II) and Self-control Scale (SCS) at three time points: baseline, post-training, and four-month follow-up.
Results: The dropout rates were 6 (8.1%) in the intervention group and 3 (4.1%) in the control group at the end of six-month intervention. The general linear model repeated measures analysis of variance revealed that comparing with the control group, the intervention group participants had more increase in their trait self-control score, at the meantime, their depressive symptoms had significantly improved. Univariate and logistic regression analyses revealed that participants with milder baseline depressive symptoms were more likely to benefit from CSCT interventions; depression improvement was also associated with the number of sessions attended.
Limitations: The main limitation was related to the small sample size which consisted of college students who were relatively young and well educated.
Conclusions: The current study demonstrates that CSCT program could temporarily enhance self-control capacity as well as improve depressive symptoms; participants who are mildly to moderately depressed, and who could adhere to the training protocol are more likely to benefit from the intervention.

1. Introduction

Some theorists hold that dysfunction of self-regulation is a risk factor for depression (Karoly, 1999; Klenk et al., 2011). In line with these theories, Strauman (2002) proposes a self-regulation model of depression, postulating that the initial episode of depression could be viewed as a functional disorder of the promotion system resulting from failure of self-regulation. Such self-regulatory dysfunction may result from a single experience or an accumulation of experiences. The core symptoms of depression might reflect dysregulation within the promotion system (e.g., mood, appetite, anhedonia, energy, concentration, worthlessness, hopelessness, low self-esteem) or dysregulation of

reciprocal inhibition between the promotion and prevention systems (e.g., sleep disturbance, guilt, agitation/anxiety) (Strauman, 2002). Study also found that chronic self-perceived failure in promotion goal pursuit was associated with vulnerability to depression, and self-system therapy (SST), a brief, structured psychotherapy aiming at enhancing promotion goal pursuit could improve depression (Strauman et al., 2006). SST conceptualizes depression as a failure of self-regulation, the structure and strategies of SST are developed to address depressive symptoms in individuals manifesting specific problems in self-regulation (Vieth et al., 2003).

Chronic or catastrophic regulatory failure (inability to make good things happen via progress toward their promotion goals, and/or

difficulty to keep bad things from happening) is often associated with dysphoric mood and anxious affect, could increase one's vulnerability to develop depression (Strauman et al., 2006). The consequences of self-regulatory failure also includes weakened self-control over impulsive behaviors, leading people more vulnerable to alcohol and drug abuse, more prone to irrational impulsive behavior, and more likely to yield to the temptations (Baumeister, 2014), and even more procrastination (Rebetez et al., 2016). Studies have shown that the bad feelings associated with self-regulation failure (guilty, self-criticism, and loss of control) could bring people to even more self-regulation failure, a phenomenon called "what-the-hell-effect", i.e., when people yield to smaller temptation, it will lead to greater loss of control (Cochran and Tesser, 1996). Daily regulatory failure, such as breaking diet plan, or not completing the study objectives, may undermine people's self-esteem and self-efficacy, making people more vulnerable to depression (Nowak et al., 2005). Studying depression from a self-regulatory perspective could facilitate the understanding of how depression develops and progresses.

The term self-regulation and self-control have similar connotation and are often used interchangeably by some researchers. Self-regulation is the process of purposefully directing one's actions, thoughts, and feelings toward a goal, i.e., an intended outcome, as compared to immediate or hedonic goals (Carver and Scheier, 2011). Self-regulation includes not only overriding or inhibiting prepotent responses but also directing behavior toward wanted responses, usually in the face of prepotent alternative responses or mere inertia (Berkman, 2016). Self-control refers to the process by which the individual adjusts his or her own thoughts, behaviors and emotions in a timely manner to align with their self-goals (Inzlicht et al., 2014). Self-control involves the ability to prevent or override unwanted thoughts, behaviors, and emotions and is essential to successful navigation of daily life (Muraven et al., 1999). Vandellen, Hoyle, and Miller (2012) tried to make a distinction between the concept of self-regulation and self-control. They view self-regulation as the general process of managing thoughts, behaviors, goals, and identity; whereas view self-control as a specific type of self-regulation that occurs only when people consciously and effortfully attempt to override prepotent, or dominant responses to situations. Unlike other forms of self-regulation, which are largely automatic (Bargh et al., 2001), self-control is a conscious process in which people are aware of what they are doing that requires an exertion of effort (Vandellen et al., 2012). Self-regulation is thus a broader concept, which requires a range of skills including self-control, planning, and other executive functions, but is not limited to those skills. Although much of the current study's theory was based on both self-regulation and self-control literatures, our focus was primarily pertinent to self-control rather than to self-regulation.

Studies have found that self-control relies on a limited resource that could be easily depleted, a phenomenon labeled ego-depletion. According to the strength model of self-control, self-control operates like a muscle that gets tired after repeated exertion (Baumeister, 2003; Baumeister and Tice, 2007; Baumeister and Vohs, 2016). Ego-depletion effect has been verified in many studies, using a great variety of tasks and measures (Hagger et al., 2010). Some studies found a moderating effect of trait self-control, such that people high in trait self-control showed less self-control failure under conditions of ego-depletion, compared to those low in trait self-control (Dewall et al., 2007; Muraven et al., 2005). Sufficient trait self-control are found to be associated with several positive long-term outcomes, such as good adjustment, less pathology, better grades and interpersonal success (Tangney et al., 2004).

On the other side, feeling bad could undermine people's valuable self-control capacity. When people are in a bad mood (anger, sadness, self-doubt, anxiety, and stressed), the reward-seeking brain areas will be activated, they will experience more intense cravings and especially susceptible to temptations such as eating, alcohol, cocaine, shopping, and whatever substance or activity that associates with the promise of

reward (Mcgonigal, 2013). Binge eaters who feel ashamed of their weight and lack of control around food tend to eat more food to fix their bad feelings (Kelly and Carter, 2013). Study found that depressed patients had inhibition deficits —a major domain of executive functioning deficit—measured by behavioral tasks, indicating depression was associated with worse self-regulatory capacity (Bredemeier et al., 2016). Psychotherapies aimed at relieving depression could also improve perceived failure in self-regulation (Strauman et al., 2001).

The strength model of self-control predicts that just as physical exercise could make muscles become stronger, self-control/regulation could also be improved by training (Baumeister and Tice, 2007). Evidences have shown that trait self-control capacity is amenable to intervention in childhood, continuing through late adolescence, and even early adulthood (Berkman et al., 2012; Muraven, 2010). For example, Muraven (2010) found that practicing self-control by cutting back on sweets or squeezing a handgrip brought significant improvement in self-control performance, they argued that the particular self-control task being practiced was unimportant, providing it required the individual to override or inhibit a response. Self-control/regulation training programs also have been developed to ameliorate particular psychological disorders, include using self-monitoring cards to reduce alcohol consumption (Miller and Taylor, 1980), training control over aggressive impulses to reduce aggressive behavior in female adolescents (Meepien et al., 2010). In general, previous self-control/regulation training programs are mainly focused on specific problem behaviors, such as addiction or aggressive behavior, in order to enhance self-control over these problem behaviors. However, an integrated conceptual model underlying these techniques tends to be underspecified and imprecise. For example, in Meepien et al. (2010) study, the authors did not describe how they trained their participants and what factors might contribute to the beneficial effect.

Now we raise the question that whether self-control/regulation training could be tailored for depressive patients? Previous studies have found that feeling bad were associated with lower self-control capacity (Berkman et al., 2012). Unlike single-problem-behavior such as addictive and aggressive behaviors, depressed patients tend to show a wide range of self-regulation deficiency manifested in both promotion system and inhibition system (Strauman, 2002), a single behavioral training program might have little effect on depressive symptoms. Self-control training programs for depressive patients need to take full account of the pathological spectrum of depression. We could reasonably speculate that characteristics in depression patients, such as loss of interest, inertia, might present special difficulty on long-term training programs. For example, study found that women with more severe eating disorder pathology and depressive mood had a higher likelihood of dropping out from a Web-based motivational enhancement program (Brachel et al., 2014). Thus an intervention program tailored for people with depressive disorder must find ways to reduce dropout rate and to improve adherence. A study published in The Lancet found that behavioral activation (BA) was on par with cognitive behavioral therapy (CBT) in reducing depressive symptoms in a large randomized controlled clinical sample with major depression (Richards et al., 2016). The authors argued that BA should be recommended as an intervention to address the adherence problem in the treatment of depressive disorders as it was less demanding and costly on the part of patients. This study suggests that to effectively improve depressive symptoms, activating behavior and promoting adherence is equally essential as treating automatic negative thoughts.

The aim of the current study was to develop a theory-based intervention program tailored for depressed patients to strengthen their self-control capacity and to improve their depressive symptoms. We would conduct a randomized controlled trial (RCT) to test whether a comprehensive self-control training (CSCT) program would be efficacious for depressed college students, and what factors might contribute to the efficacy. We would test two hypotheses: a) that whether trait self-control could be enhanced by CSCT and b) that whether depressive