



Brief articles

Randomized trial comparing mindfulness training for smokers to a matched control[☆]

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ABSTRACT

Smoking continues to take an enormous toll on society, and although most smokers would like to quit, most are unsuccessful using existing therapies. These findings call on researchers to develop and test therapies that provide higher rates of long-term smoking abstinence. We report results of a randomized controlled trial comparing a novel smoking cessation treatment using mindfulness training to a matched control based on the American Lung Association's Freedom From Smoking program. Data were collected on 175 low socioeconomic status smokers in 2011–2012 in a medium sized midwestern city. A significant difference was not found in the primary outcome; intent-to-treat biochemically confirmed 6-month smoking abstinence rates were mindfulness = 25.0%, control = 17.9% ($p = 0.35$). Differences favoring the mindfulness condition were found on measures of urges and changes in mindfulness, perceived stress, and experiential avoidance. While no significant differences were found in quit rates, the mindfulness intervention resulted in positive outcomes.

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1. Introduction

Mindfulness is a cognitive skill of paying attention to internal phenomena (e.g., thoughts, emotions) or external phenomena (e.g., walking, talking) in a way that is intentional rather than automatic, non-reactive rather than reactive, and accepting rather than critical (Kabat-Zinn, 1990, 1994; Segal, Williams, & Teasdale, 2002). Studies have shown that mindfulness training is associated with decreased smoking urges (Westbrook et al., 2011), decreased stress (Grossman, Niemann, Schmidt, & Walach, 2004), increased distress tolerance (Grossman et al., 2004; Shapiro, Oman, Thoresen, Plante, & Flinders, 2008), decreased anxiety (Creswell, Way, Eisenberger, & Lieberman, 2007; Hofmann, Sawyer, Witt, & Oh, 2010; Koszycki, Benger, Shlik, & Bradwejn, 2007), decreased depression (Teasdale, Segal, & Williams, 1995), and improved emotion regulation (Deckersbach et al., 2012; Farb, Anderson, & Segal, 2012; Hill & Updegraff, 2012; Hofmann et al., 2010; Kemeny et al., 2012; Mars & Abbey, 2010).

Mindfulness training as therapy for smokers has shown some promise. A pilot study of MBSR (with modifications for smokers) yielded smoking abstinence at 6 weeks post-cessation of 56% (Davis, Fleming, Bonus, & Baker, 2007). A follow up study showed that mindfulness training, compared to telephonic quit line, yielded significantly higher biochemically confirmed abstinence rates at 4–

weeks and 24-weeks post-quit in treatment initiators (Davis et al., 2014). A study showed “urge surfing” (a mindfulness technique) led to fewer cigarettes smoked per day (Bowen & Marlatt, 2009), and another study found that ACT (including mindfulness training) led to increased rates of smoking abstinence 1-year post-quit (Gifford et al., 2011).

While the initial reports have been promising, more stringently controlled study designs are needed to better isolate the effect of mindfulness in smokers (Baardseth et al., 2013; Chiesa & Serretti, 2009; Maccoun et al., 2012; Wampold, 2001; Wampold et al., 1997). A recent study by Brewer et al. (2011) compared mindfulness training for smoking cessation to the American Lung Association's Freedom from Smoking (FFS; American Lung Association, 2013). FFS is one of the most widely used intensive (2 months) smoking cessation intervention available in the US (Thieleke, McMahon, Meyer, & Yun, 2005). It provides cognitive behavioral modification, skills training and group support, and has demonstrated 1-year post-quit biochemically confirmed abstinence rates of 16% (Thieleke et al., 2005). The Brewer, Mallik, et al. (2011) trial showed that mindfulness training compared to FFS produced non-significantly higher abstinence post-treatment and significantly higher abstinence rates 13-weeks post-quit. The study provided the FFS intervention in a way that was faithful to its clinical implementation, but made few alterations in FFS to time/intensity match the mindfulness intervention.

In this paper we describe an intervention providing mindfulness training for smokers (MTS) compared to FFS. Ours study differs from Brewer, Mallik, et al. (2011) in that substantial “enhancements” were made to FFS (referred to here as FFS-E) in order to more closely match

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the two interventions, and better isolate and test the effect of mindfulness training. Additionally, recruitment in the present study was carried out with a low socioeconomic status (SES) population. We were unable to find published studies on mindfulness training for low SES smokers or the effect of SES on outcomes in mindfulness training. Low SES smokers were targeted because smoking occurs disproportionately among low-SES individuals (David, Esson, Peruce, & Fitzpatrick, 2010; Hiscock, Bauld, Amos, Fidler, & Munafo, 2012; Kunst, Giskes, & Mackenbach, 2004), and it seemed important to understand whether training in mindfulness – a conceptually abstract cognitive skill – would be well received within a low SES population. It was our supposition that mindfulness training could be provided using concrete language and accessible examples such that it would be well-received and effective in this population. Furthermore, it was felt that if mindfulness training could be provided in a way that was effective in this challenging population, we would have a promising model for use in the wider population of smokers. The purpose of this study was to compare MTS to FFS-E on measures of class attendance, attrition, practice compliance, smoking abstinence, urge intensity, mindfulness acquisition, and psychological outcomes.

2. Materials and methods

2.1. Study recruitment

Participants living in low SES areas of a mid-sized midwestern city were targeted for recruitment via advertisements placed on television, newspaper, and flyers. Phone screening inclusion/exclusion criteria required that participants be at least 18 years of age, smoke five or more cigarettes per day, use no other tobacco products, claim high motivation to quit, and not consume more than four alcoholic drinks on more than 4 days per week.

2.2. Procedures

Callers who passed phone screening were invited to an orientation visit at a study center where they were evaluated for suicidality via the Patient Health Questionnaire (PHQ-9; Kroenke, Spitzer, & Williams, 2001). At the orientation meeting, potential participants received an overview of two high intensity interventions (MTS/FFS-E) and a lower intensity quit line (QL) intervention that used the Wisconsin Tobacco Quit Line (WTQL) as its behavioral therapy. At the orientation, the WTQL was described as “the most widely used and studied smoking cessation intervention in the state,” FFS-E as an “enhanced version of a well-studied, widely used intervention”, and MTS as a “novel and unproven intervention.” Potential participants were told that all interventions provided equal payment and cessation medications, and were asked to choose whether they wished to be placed in a low intensity (QL) or high intensity (MTS/FFS-E) intervention. This design was employed so MTS/FFS-E participants were not motivated principally by free patches or payment but in part by a desire to attend a high-intensity intervention. Consented individuals completed the baseline assessment visit (Fig. 1).

2.3. QL intervention

If participants chose QL, they were asked to place a phone call to the WTQL (run by Alere-Wellbeing) while still at the study center. This initial call lasted approximately 45 minutes and consisted of speaking to intake personnel and a quit coach who provided motivational interviewing and assistance in developing a quit plan. QL participants were provided with 2 weeks of nicotine patches, self-help materials, an interactive Website, and were offered unlimited free follow-up calls to the WTQL.

2.4. Randomization

Participants who chose the higher intensity intervention (MTS or FFS-E) were scheduled to attend their first class where they were randomized to MTS or FFS-E and immediately began treatment. The use of randomization followed immediately by therapy was employed to reduce dropout. At the first class, MTS participants were given the MTS Manual, meditation CD and access to the MTS Website. FFS-E participants were given a FFS-E Manual, relaxation CD and access to the FFS Online Premium Program.

2.5. Mindfulness training

The MTS course for smokers lasted 7 weeks, and was comprised of seven 2½-hour classes and a 6½-hour Quit Day Retreat (total = 24 hours) (Table 1). During each class, instructors would play approximately 20 minutes of the MTS Instructional Video, which provided instruction in mindful meditation, walking, smoking, eating, and mindful management of smoking triggers, urges, addictive thoughts and emotions. After playing the DVD, instructors would lead exercises and provide more nuanced and individualized instruction. The final hour of class was a “meditation group,” consisting of guided meditation and group-support practice called “mindful talking and listening.” On the Quit Day Retreat, smokers attempted smoking cessation and initiated a 2-week course of nicotine patches. After the intervention, participants were invited to continue to attend the meditation group at any time. Throughout the MTS intervention participants were asked to practice 15–30 minutes of meditation per day at home with a guided meditation CD.

2.6. Matching of MTS and FFS-E

MTS and FFS-E were matched in time and intensity, pharmacotherapy (2 week of nicotine patches) and in almost every other way feasible (Table 1). The goal of this matching was to maintain the core practices and materials of FFS (American Lung Association, 2013), but to provide “enhancements” to FFS that would allow it to match MTS so as to isolate the core differences between therapies: MTS would provide training in mindfulness and meditation, whereas FFS would provide training in a variety of cognitive skills and relaxation. Matching of FFS-E to MTS included the following “enhancements”: 1) to match MTS, total time in FFS-E was increased to 24 hours (FFS typically provides eight 90–120 minute sessions (12–16 hours) (American Lung Association, 2014) (Prochaska, DiClemente, Velicer, & Rossi, 1993; Stead & Lancaster, 2005); 2) like MTS, FFS-E classes provided an additional 30 minutes per class for group sharing and support, (Rosenbaum & O'Shea, 1992); 3) to match meditation practice in MTS, FFS-E emphasized relaxation, by including a 15–30 minute relaxation practices in each class, 15–30 minute assigned daily guided relaxation with a CD, logged practice time, and weekly discussion on effects of this practice (FFS provides the same relaxation CD, but the practice is not emphasized in this way) (Manzoni, Pagnini, Castelnuovo, & Molinari, 2008); 4) like MTS, FFS-E was provided with an optional long-term weekly support group (Zhu et al., 1996); 5) materials were matched with 90 page manuals and CDs of similar appearance provided to each group; 6) instructor qualifications and training between the two groups were matched. All instructors for the two interventions had a master's degree in psychology (except for one MTS instructor who had a PhD in sociology), and no instructor had specialized training or certification in addiction therapy (FFS instructors are typically laypeople). MTS instructors were provided with a 2-day MTS teacher-training course, whereas, FFS-E instructors were provided with a similarly structured 2-day FFS-E teacher-training course (Stein & Lambert, 1995).

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