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A Pilot Study of a Readiness Group to Increase Initiation of Smoking Cessation Services among Women in Residential Addiction Treatment

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ABSTRACT

This study implemented a smoking cessation readiness group (RG) in two women-focused residential substance abuse treatment programs, with the aim of engaging women in smoking cessation services. The primary outcome was defined as attending at least one cessation group after the RG ended. The RG combined features of the Expert Systems (ES) approach with a practice quit attempt. ES is an interactive system which tailors intervention to the smokers' stage of change, while the practice quit attempt rehearses the process of quitting smoking. As a secondary aim we tested whether incentives, used to promote participation and engagement in the RG, would increase initiation of smoking cessation services. Participants (N = 75) were women smokers enrolled in two residential programs, and intention to quit smoking was not required for participation. Twelve participant cohorts were randomly assigned to receive the RG with or without incentives. Following the RG intervention, 38.7% of participants (n = 29) attended at least one smoking cessation session. Both the number of RG sessions attended and a successful practice quit attempt predicted the later use of cessation services, while incentives did not. From pre- to post-RG, participants reported decreased cigarettes per day (CPD: 11.8 vs. 7.6, $p < .0001$) and decreased nicotine dependence as measured by the Heaviness Smoking Index (HSI: 2.3 vs. 1.8, $p < .001$). The 3-session group-format RG intervention was associated with initiation of smoking cessation services and with changes in smoking behavior.

1. Introduction

Smoking prevalence in the U.S. has declined from 40% in 1964 to 17.8% currently (Jamal et al., 2014; U.S. Department of Health Education and Welfare, 1964). However, persons with either a mental disorder or substance abuse disorder are twice as likely to smoke as those without (Lasser et al., 2000). Smokers with other drug addictions smoke more heavily (Hughes, 2002; Sobell, 2002) and are less successful in their attempts to quit smoking (Drobes, 2002; Joseph, Nichol, & Anderson, 1993). They experience greater tobacco-related mortality than the general population (Bandiera, Anteneh, Le, Delucchi, & Guydish, 2015) and are more likely to die from tobacco-related causes than from other drug-related causes (Hurt et al., 1996). While smoking prevalence is higher among persons with substance use disorders (Grant, Hasin, Chou, Stinson, & Dawson, 2004; Lasser et al., 2000), it is highest among those in substance abuse treatment. National Survey on Drug Use and Health data show that smoking prevalence among persons who received past year drug treatment, for 2006–2011, ranged from 72.6% to 74.5% (Guydish, Yu, Le, Pagano, & Delucchi, 2015).

Quitting smoking does not jeopardize recovery from other drug use (Kalman, Kim, DiGirolamo, Smelson, & Ziedonis, 2010; Martin et al., 1997; Stuyt, 1997). Smoking cessation during the first year after admission to addiction treatment was associated with improved drug use outcomes in one study (Tsoh, Chi, Mertens, & Weisner, 2011), and a meta-analysis found that patients receiving tobacco intervention during addiction treatment had a 25% higher likelihood of abstinence from other drugs (Prochaska, Delucchi, & Hall, 2004). However, smoking cessation intervention achieves modest quit rates in this population. In general population smokers, Fiore et al. (2008) estimated that 7-day point prevalence abstinence rates at 6 months were 14.6% for counseling interventions, 21.7% for medication interventions, and 27.6% for interventions using both approaches. In comparison, a meta-analysis of studies of smokers who received addiction treatment reported 12% post-treatment smoking abstinence (Prochaska et al., 2004). Another review reported 6-month tobacco abstinence rates from 2% to 18% in drug treatment samples (Baca & Yahne, 2009).

Smoking is not addressed in most substance abuse treatment programs (Friedmann, Jiang, & Richter, 2008; Fuller et al., 2007; Knudsen

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& Studts, 2011; Richter, Choi, McCool, Harris, & Ahluwalia, 2004). Barriers to smoking cessation in these settings include resource limitations, lack of reimbursement, and elevated rates of staff smoking (Guydish, Passalacqua, Tajima, & Manser, 2007). When asked directly, many clients express interest in quitting (Orleans & Hutchinson, 1993; Saxon, McGuffin, & Walker, 1997). However some staff feel that patients are not interested in quitting (Hahn, Warnick, & Plemmons, 1999), and some patients believe that quitting smoking may make it harder to stop other drug use (Asher et al., 2003). About half of smokers enrolled in addiction treatment have tried to quit within the past year (Martinez, Guydish, Le, Tajima, & Passalacqua, 2015). These findings suggest that, in addition to organizational and policy-level interventions, patient-level motivation may be needed to improve the uptake of cessation interventions.

Some motivational approaches used in smoking cessation are Expert System (ES: Prochaska, Velicer, Fava, Rossi, & Tsoh, 2001), motivational incentives (also called contingency management), and the practice quit attempt (Carpenter, Alberg, Gray, & Saladin, 2010). ES is an interactive system, based on the Transtheoretical Model, which tailors intervention to the smokers' stage of change. ES delivers a computer-generated personalized feedback report with suggestions for actions based on the individual's stage of change and provides decisional balance (pros and cons) with respect to smoking (Prochaska et al., 2001). ES has been effective in treating smokers at different stages of readiness to quit (Prochaska et al., 2001; Velicer, Prochaska, & Redding, 2006; Velicer, Redding, Sun, & Prochaska, 2007), and in various settings (Hall et al., 2006; Prochaska et al., 2008). Motivational incentives are external rewards contingent on goal-related behaviors. One study in residential addiction treatment provided incentives up to $10 for consecutive negative daily carbon monoxide (CO) tests (Robles et al., 2005). Smoking abstinence increased, but voucher costs averaged $526 per participant. In another study prize draws escalated with consecutive negative COs, yielding more smoking reduction, but not more cessation, compared to controls (Alessi, Petry, & Urso, 2008). Last, Carpenter and colleagues pioneered the practice quit attempt as a way to rehearse for a quit attempt without the pressure of quitting smoking for good (Carpenter et al., 2010). In a randomized trial, the practice quit attempt in conjunction with NRT achieved higher rates of making a quit attempt (49% vs. 40%) compared to a practice quit attempt without NRT (Carpenter et al., 2011).

The pilot study reported here began in consultation with the leadership of HealthRight 360 (HR360), a 501(c) 3 non-profit agency providing behavioral health services to indigent Californians. HR360 program directors wanted to address smoking, but observed that patients were often not ready or not interested to quit. We developed a three-session smoking cessation readiness group (RG) using ES strategies combined with a practice quit attempt. The aim was to engage smokers in smoking cessation, and the primary outcome was initiation of smoking cessation services. Second, in a pilot randomized trial we assessed whether the addition of incentives for participation in the RG would improve initiation of smoking cessation services.

2. Methods

2.1. Setting

HR360 prioritized two women-focused residential programs for study participation. The Female Offender Treatment and Education Program (FOTEP) serves women who are paroling from state prisons, have substance abuse and trauma issues, and may be interested in reunifying with their children. The program has the capacity to serve 63 adult women and 15 children, ages 0–12. The focus is on issues specific to female offenders, including trauma, communication, parenting, family reunification, development of pro-social behavior, exploration of issues which drive substance abuse and criminal behavior, and educational and vocational preparation. Women may remain in the FOTEP program up to 15 months, and the median length of stay is about 3 months (87 days). The Women's Residential Behavioral Health Treatment program is a 64-bed gender-responsive and trauma-informed program, with services designed to address substance use, trauma, mental illness, health and wellness, medication support, spirituality, family reunification, employability, homelessness, and sober living skills. Women may remain in this program up to 6 months, and the median length of stay is about 2 months (53 days). A third site houses a computer laboratory and group meeting space where most of the data collection, ES sessions, and readiness and cessation groups were held.

2.2. Participants

Eligible participants were women in each of the residential programs who had been in treatment for at least 2 weeks, self-identified as current smokers, reported smoking on a daily basis, were not currently pregnant, and were willing to participate in the readiness intervention.

2.3. Study Design

Participants were enrolled in a total of 12 RG cohorts according to the time of enrollment. Cohorts were randomly pre-assigned, using a random number generator, to either the incentive ($n = 6$ cohorts) or control ($n = 6$ cohorts) condition. Research staff, the RG leader, and clients were blinded to condition until baseline data collection was completed. The day before the RG was to begin, the RG leader was informed of the incentive condition. Participants learned of the group condition at the first RG session. Cohorts ranged in size from 2 to 11, with a median of 7 per cohort. Smoking behavior was measured in a pre–post design, before and after the RG intervention.

2.4. The Smoking Cessation Readiness Group (RG)

The pilot RG intervention is guided by the Transtheoretical Model, which conceptualizes individual stages of change to both understand and modify behavior (Velicer, Prochaska, Fava, Laforge, & Rossi, 1999). However the RG also incorporates a practice quit attempt, similar to the cognitive-behavioral concept of a behavioral experiment, in which the participant rehearses a particular behavior (Carpenter et al., 2010). In the incentive condition, the RG intervention incorporates behavioral theory and operant conditioning (Stitzer, Petry, & Peirce, 2010). The RG is a multi-intervention package consisting of personalized normative feedback, didactic presentation, skills training personalized to stage of change, a facilitated personalized quit attempt supported by access to NRT and, in one condition, incentives.

Each RG participant completed a computerized ES assessment, at baseline, and received a computer-generated personalized feedback report. The RG was designed to support participants in working through the ES Personalized Activities Center (PAC) activities and resources. In many residential treatment programs, patient access to computers and phones is restricted for clinical reasons. In the study programs, computer access required staff permission as well as coordination of the patient's clinical schedule and computer availability. Because of these practical considerations, the ES intervention was modified. The ES assessments at baseline and 30 days were completed by patients online. All other ES-related activities were conducted either in the RG or as homework between sessions, using paper printouts of PAC activities. Session one introduced handouts from PAC activities specific to each stage of change (e.g. "Take small steps," "Change your image", and "Overcome the cons" for the contemplation stage), and later sessions introduced PAC handouts that were relevant to all stages of change. Worksheets were provided for participants to write brief notes about their PAC handout related activities, next steps, and questions. The second purpose of the readiness group was to support participants in a quit attempt with NRT. Therefore, in addition to materials from ES, participants received handouts with NRT information and instructions. An intervention manual is available at http://addiction.ucsf.edu/.

Session one began with discussion of participant ES personalized feedback reports, including their stage of change for smoking cessation, and ES-recommended goals and strategies for change. NRT use was discussed