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## Mood Management Intervention for College Smokers with Elevated Depressive Symptoms: A Pilot Study

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### Abstract

**Objective**—This pilot study examined smoking reduction and cessation among college smokers with elevated depressive symptomatology participating in a group-based behavioral counseling, mood management, and motivational enhancement combined intervention (CBT).

**Participants & Methods**—Fifty-eight smokers (smoked 6 days in the past 30) were randomized to six sessions of CBT ( $n=29$ ) or a nutrition-focused attention-matched control group (CG,  $n=29$ ).

**Results**—Relative to CG participants, significantly more CBT participants reduced smoking intensity by 50% ( $\chi^2(1, N=58)=4.86, p=.028$ ) at end of treatment. Although CBT participants maintained smoking reductions at 3- and 6-month follow-up, group differences were no longer significant. No group differences in cessation emerged. Finally, participants in both groups evidenced increased motivation to reduce smoking at end of treatment ( $F(1, 44)=11.717, p=.001, \eta_p^2=.207$ ).

**Conclusions**—Findings demonstrate the utility of this intervention for smoking reduction and maintenance of reductions over time among a population of college students with elevated depressive symptomatology.

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Cigarette smoking causes significant morbidity and mortality and represents a major public health concern.<sup>1</sup> Approximately 30-44% of college students report smoking in the past 30 days,<sup>2-4</sup> yet few cessation interventions have been evaluated for this population.<sup>5, 6</sup> Prior studies of smoking interventions designed for college students show mixed results,<sup>7-11</sup> however promising work suggests that smoking interventions may indeed impact use.<sup>5</sup>

In addition to smoking, many college students report significant depressive symptoms,<sup>12</sup> an experience with the potential to increase smoking behavior and impede cessation.<sup>13, 14</sup> Research with adolescents and adults documents cross-sectional and longitudinal associations between depressive symptoms and lifetime prevalence of Major Depressive Disorder (MDD) and cigarette smoking.<sup>13, 15, 16</sup> Recent work suggests that the positive relationship between depressive symptoms and smoking extends to college students.<sup>17</sup> College students may initiate, maintain, or relapse back to smoking to cope with stress and negative affect.<sup>18</sup>

Recent research among adults suggests that cognitive-behavioral mood management (CBT) interventions for smoking cessation may be effective for smokers with current elevations in depressive symptoms.<sup>19</sup> Smokers with a past history of alcohol dependence were assigned to either CBT or standard behavioral counseling (BC). Smokers in the CBT group, who had elevated depressive symptoms, were more likely to achieve abstinence than did participants

with lower depressive symptoms. Conversely, smokers in the BC, who had lower depressive symptoms, were more likely to achieve abstinence than smokers with higher depressive symptoms.<sup>19</sup> Other CBT cessation research has employed participants with a history of MDD and studies suggest that CBT may also be superior to BC for individuals with a history of multiple depressive episodes.<sup>20, 21</sup> Therefore, additional mood management support appears effective for smoking cessation among those with mood disturbance. Despite this, no research has reported on the effectiveness of mood management interventions for college student smokers experiencing elevated levels of depressive symptoms. To fill this gap and extend the existing research, we designed and implemented a group-based CBT intervention targeting smoking reduction and cessation among college student smokers (smoking  $\geq 6$  days in the past 30) with elevated depressive symptomatology. We adapted the CBT intervention from existing smoking cessation protocols<sup>22, 23</sup> and combined mood management (e.g., identifying and challenging negative thoughts that lead to low mood and smoking and relaxation exercises), behavioral counseling (e.g., self-monitoring and self-management of triggers for smoking) and motivational enhancement (e.g., exploring ambivalence and eliciting change talk).

The goal of this project was to design and test an intervention with high relevance for the college smoking population and with the potential for implementation in college health service settings. To facilitate these goals, we reduced the length of the treatment to ensure that groups would start and end within a single academic semester. In addition, we targeted occasional and daily smokers with varying interest and motivation in quitting because we wanted to derive a sample representative of college student smokers and because recent research suggests that occasional smoking prevalence is increasing.<sup>24</sup> The intervention included a motivational enhancement component because participants included those with low levels of motivation to quit. Thus, the intervention included a strong motivational enhancement component. Finally, we targeted smoking reduction as well as cessation because of recent positive findings regarding reduction interventions for smokers not motivated to quit<sup>25</sup> and the apparent finding that these reductions might facilitate future cessation efforts.<sup>25, 26</sup>

We compared CBT to an active attention-matched control group (CG) focusing on increased consumption of fruits and vegetables. Relative to a control group that receives treatment-as-usual, the active control provided a more rigorous test of our intervention and offered CG participants an opportunity to improve health. Our primary hypothesis was that, relative to CG participants, a greater proportion of CBT participants would report 50% or greater reduction in number of cigarettes smoked at end of treatment (EOT), 3-month (3 mo FU) and 6-month (6 mo FU) follow-up. Similarly, we hypothesized that a significantly greater proportion of CBT participants would report 30-day point-prevalence abstinence at EOT, 3 mo FU, and 6 mo FU. Given the intervention's inclusion of motivational enhancement, secondary hypotheses were that relative to CG participants, CBT participants would report greater increases in confidence and motivation to reduce smoking from baseline to EOT, 3 mo and 6 mo FU. Lastly, we expected this pilot investigation to be feasible, as demonstrated by high treatment attendance and satisfaction among CBT participants.

## Methods

### Participants

As presented in the sampling diagram (Figure 1), 1,380 participants aged 18 years or older completed screening measures for course credit during three academic semesters (2007-2008). Screened participants ( $n=1380$ ) were mostly female (61.6%), Freshmen (71.2%), and had a mean age of 19.68 ( $SD=3.47$ ). Study personnel telephoned interested participants who met the following screening criteria: smoking  $\geq 6$  days in the past 30

(screened by the Centers for Disease Control and Prevention<sup>27</sup> question: “During the past 30 days, on how many days did you smoke cigarettes?”), elevated depressive symptomatology (Center for Epidemiological Studies-Depression Scale (CES-D) sum = 16<sup>28</sup>), and a degree of motivation to quit smoking (Contemplation Ladder rating = 3, indicating some awareness of problems associated with smoking<sup>29</sup>). Participants were excluded if they reported recent (past 30 days) participation in a structured smoking cessation program ( $n=0$ ), current suicidal intent or plans ( $n=0$ ) or current Major Depressive Episode ( $n=4$ , indexed using a diagnostic algorithm from the Patient Health Questionnaire-9,<sup>30</sup> a measure of DSM-IV TR symptoms of MDE). No significant differences emerged on screening measures for those who agreed to participate and those who refused or could not be reached.

As shown in Figure 1, 58 undergraduate smokers with elevated depressive symptomatology were randomized to participate in the treatment (CBT) and control (CG) groups. The 58 eligible participants were randomized to groups on an individual basis using a random number table, blocking on smoking level and motivation to quit. We blocked according to CDC-defined<sup>31</sup> smoking level (occasional smoking = 1-9 days in the past 30 vs. frequent smoking = 10-20 days in the past 30) and motivation to quit (Contemplation Ladder score = 5 vs. 6) so that groups were matched on these characteristics at baseline. Project personnel were not blind to group assignment. Major assessment intervals occurred at screening, baseline (session 1: week 0), EOT (session 6: week 8), 3 mo FU (12 weeks from baseline), and 6 mo FU (24 weeks from baseline). The first five group sessions occurred weekly and the last group session took place 30 days after session 5 in order to assess 30-day smoking outcomes at EOT. Incentives for participation were partial course credit, small non-monetary incentives such as campus coupons and pizza at sessions, and a total of \$60 for completing study measures. In addition, for each attended group session, participants entered their names in a drawing to win an iPod at the final group session. The University of Montana Institutional Review Board (IRB) approved all study procedures and participants provided written informed consent at screening and baseline.

## Interventions

**Treatment condition**—The treatment condition was an adaptation of a 12-week group-based combined behavioral counseling and cognitive-behavioral mood management intervention found previously to significantly enhance smoking treatment outcomes among abstinent alcoholics with a history of major depression.<sup>22</sup> The original treatment outperformed standard behavioral counseling for daily smokers with elevated depressive symptoms.<sup>19</sup> We modified the 12-week intervention by reducing the number of sessions to 6 to accommodate college students’ preferences and the semester schedule. In addition, we incorporated material from a clinical handbook on tobacco dependence treatment outlining an 8-week intensive mood management intervention.<sup>23</sup>

Intervention participants were taught that smoking is a learned behavior, a physical addiction, and that smoking is related to mood.<sup>22</sup> The CBT component utilized a behavioral chain to outline associations among triggers (i.e., any event, person, or feeling that precedes smoking), thoughts, feelings, and behavior. Group leaders demonstrated how emotional and behavioral reactions vary with cognition and facilitated discussion of ways to combat negative thinking (e.g., examine the evidence, substitution).<sup>22</sup> Participants used thought logs to identify and challenge thought distortions. We began each session with relaxation training (i.e., abdominal breathing, imagery, or progressive muscle relaxation) to expand participants’ repertoires for mood and stress management, and we had participants list pleasant activities which we encouraged them to increase each week.<sup>23</sup> The behavioral counseling component included self-monitoring of smoking and triggers to facilitate a greater understanding of smoking patterns and triggers.<sup>22, 23</sup> Group leaders used the ‘three

A's' (e.g., avoid trigger situations, alter situations, and use an alternate or substitute) and participant discussion to problem solve ways to manage trigger situations.<sup>23</sup> At the 4<sup>th</sup> group session all participants were invited to make a quit or change plan, and participants received information about pharmacotherapy for smoking cessation. In addition, group leaders discussed how relapse is not an all-or-none event and problem solved high-risk situations.<sup>22, 23</sup>

Finally, the smoking intervention incorporated motivational approaches<sup>32</sup> such as expressing understanding, rolling with resistance, developing discrepancy (e.g., values clarification and pros and cons), and increasing self-efficacy. Treatment groups were conducted by two advanced graduate students in clinical psychology, including the first author.

**Control condition**—The active control condition was a 6-session group designed specifically for this study to increase the consumption of fruit and vegetables and to equate clinical contact time between study conditions. This nutrition group included weekly self-monitoring of fruit and vegetable consumption, nutrition education, and motivational approaches aimed at increasing consumption. Neither smoking nor smoking cessation was discussed in the nutrition groups. Control groups were conducted by two advanced graduate students in psychology or public health.

All group leaders received training in motivational interviewing. Group leaders met at least once before groups began to review curricula. Weekly supervision included a review of plans for upcoming sessions. Two blind, independent raters assessed therapist adherence to the treatment manuals by reading group case notes and indicating which topics were covered each session. Examining topics across all sessions, inter-rater agreement was high for CBT ( $\kappa=.88$ ), behavioral counseling ( $\kappa=.94$ ), and fruit and vegetable education ( $\kappa=.94$ ), and moderate for motivational enhancement ( $\kappa=.53$ ).

## Measures

**Demographics**—Socio-demographic information was assessed via self-report.

**Smoking**—Timeline follow-back (TLFB) procedures assessed number of cigarettes smoked in the past 30 days.<sup>33</sup> Trained study personnel guided participants in use of a calendar and memory aids like key dates to provide retrospective estimates of the number of cigarettes smoked each day. To reduce intentional inaccuracy of reported cessation we obtained saliva samples at EOT, informing participants that samples would be tested for nicotine.<sup>34</sup> We tested samples from all participants reporting 7-day abstinence at EOT ( $n=7$ ) and found confirmatory results for six of the seven samples (one sample was unreadable). Primary smoking outcomes included significant reduction in number of cigarettes smoked in 30 days from baseline to EOT and FU (defined as 50% or greater reduction<sup>25</sup>) and 30-day point prevalence abstinence. For missing TLFB data ( $n=5$  one item missing,  $n=2$  two items missing), we inserted data based on smoking patterns from weekday and weekend use reported in the current month. No participants reported use of medications to help them quit smoking at any time during this study.

**Motivation and confidence**—Four separate questions were modified from Miller and Rollnick<sup>32</sup> to assess motivation and confidence to quit and reduce smoking with scales ranging from 0 to 10 (0=not at all motivated/confident and 10=Very motivated/confident).

**Depressive symptoms**—The 21-item Beck Depression Inventory-II (BDI-II)<sup>35</sup> assessed depressive symptoms. BDI-II scores range from 0 to 63, with higher scores reflecting worse

depressive symptomatology. The BDI-II demonstrates good internal consistency reliability ( $\alpha=.93$ ) and construct validity.<sup>33</sup>

**Treatment satisfaction**—A slightly modified version of the 8-item Client Satisfaction Questionnaire (CSQ-8)<sup>36</sup> assessed CBT participants' treatment satisfaction at EOT. The CSQ-8 assessed issues relevant to satisfaction, including participants' views of the helpfulness of their intervention for smoking cessation, and the likelihood of recommending the intervention to friends/family.

## Data Analyses

We conducted analyses using two-tailed tests with  $p<.05$  level of significance. Descriptive statistics summarized sample characteristics at screening and baseline. Group differences were assessed using independent t-tests for continuous variables and the Chi-square test for categorical variables.

Our primary outcomes were 1) smoking reduction and 2) 30-day point prevalence abstinence at EOT, 3 mo and 6 mo FU. Analyses for these outcomes employed intent-to-treat methodology and included all 58 randomized participants. There were no significant differences between groups on demographic or baseline variables.

For the remaining secondary analyses, participants who completed at least 1 treatment session and for whom we had outcome data were included (EOT:  $n=46$ ; 3 mo FU:  $n=35$ ; 6 mo FU:  $n=34$ ). No significant differences existed between these participants and those who did not complete group sessions and EOT/3 mo/6 mo on screening variables (all  $ps>.05$ ). Multivariate analysis of variance (MANOVA) compared changes in motivation and confidence. These analyses compared CBT and CG participants from baseline to EOT, 3 mo and 6 mo FU and assessed for time effects and for a treatment by time interaction. Following standard procedures we performed follow-up testing of significant effects on MANOVA by examining the dependent variables separately using univariate analysis of variance (ANOVA). Descriptive statistics summarized CBT treatment satisfaction.

## Results

Intervention study participants who completed baseline questionnaires ( $n=53$ ) had a mean age of 21 ( $SD=4.6$ ). The sample was 51% female and 68% were Freshmen. The racial make-up of the sample was mostly White (85%) with a smaller number of Hispanic/Latino (3.8%), American Indian or Alaska Native (3.8%), Asian/Pacific Islander (5.8%), and "other" (1.9%). Few participants were currently in psychotherapy (8%), but a larger percentage (60%) had attended psychotherapy in the past. Participants smoked an average of 25 days ( $SD=6.6$ ) in the past 30, were "minimally" depressed on the BDI-II ( $M=12.8$ ,  $SD=7.6$ ), and on average rated their motivation to quit smoking as "6" on a ten point scale ( $SD=2.7$ ). No significant differences (all  $ps>.05$ ) were observed between groups.

## Smoking Outcomes

Primary outcome analyses ( $n=58$ ) revealed that the proportion of CBT participants that reduced their smoking by 50% was significantly greater than that of CG ( $\chi^2(1, N=58)=4.86$ ,  $p=.028$ ) at EOT. At 3 mo and 6 mo FU, no group differences in smoking reduction emerged ( $ps>.05$ ) (Figure 2).

Thirty-day point prevalence abstinence did not differ significantly between CBT (6.9%; 2 of 29) and CG (3.4%; 1 of 29) at EOT, 3 mo FU (10.3%; 3 of 29 in both groups), or 6 mo FU (CBT: 13.8%; 4 of 29 and CG: 10.3%; 3 of 29) ( $ps>.05$ ).

## Motivation and Confidence Outcomes

Secondary analyses employed MANOVA to examine the effects on motivation and confidence to reduce smoking. The MANOVA for the treatment by time interaction at EOT did not reach the established cutoff of significance ( $p < .05$ ) ( $\Lambda = .894$ ,  $F(2, 43) = 2.545$ ,  $p = .090$ ,  $\eta_p^2 = .106$ ) (Table 1). In addition, no significant treatment by time interaction emerged at 3 mo or 6 mo FU (3 mo FU:  $\Lambda = .956$ ,  $F(2, 32) = .732$ ,  $p = .489$ ,  $\eta_p^2 = .044$ ; 6 mo FU:  $\Lambda = .983$ ,  $F(2, 31) = .274$ ,  $p = .762$ ,  $\eta_p^2 = .017$ ). A significant time effect emerged at EOT ( $\Lambda = .790$ ,  $F(2, 44) = 5.854$ ,  $p = .005$ ,  $\eta_p^2 = .210$ ), but not at 3 mo ( $\Lambda = .866$ ,  $F(2, 33) = 2.549$ ,  $p = .093$ ,  $\eta_p^2 = .134$ ) or 6 mo FU ( $\Lambda = .898$ ,  $F(2, 32) = 1.819$ ,  $p = .178$ ,  $\eta_p^2 = .102$ ). Univariate tests revealed that the main effect of time at EOT was significant for motivation to reduce ( $F(1, 44) = 11.717$ ,  $p = .001$ ,  $\eta_p^2 = .207$ ) but not confidence to reduce ( $p > .05$ ).

## Treatment Attendance and Satisfaction

For treatment attendance, 75.9% ( $n = 44$ ) of the 58 randomized participants completed at least 4 group sessions and numbers were similar across groups (CBT;  $n = 21$ , CG;  $n = 23$ ). In addition, we retained 79.3% ( $n = 46$ , 23 in each condition) of the 58 randomized participants from the first treatment session to EOT. With regard to treatment satisfaction among the CBT participants, 60.8% ( $n = 14$ ) found the group helpful for quitting smoking and 91.3% ( $n = 21$ ) reported it was helpful for reducing smoking. Furthermore, all CBT participants said they would recommend the group to a friend for quitting or reducing smoking and 78.2% ( $n = 18$ ) said they would come back to the group if they wanted to change their smoking in the future. Of note, 60.9% ( $n = 14$ ) reported that they would prefer the group format to individual sessions.

## Comment

College student smokers are an understudied population, yet their smoking rates are high and positively correlated with depressive symptoms, which may impede cessation efforts. There is some promising evidence for mood management interventions among smokers with elevated depressive symptoms, yet no interventions of this kind have been developed and tested for depressed college smokers. Thus, this study tested a novel multi-component psychotherapeutic smoking reduction/cessation intervention designed for college student smokers with elevated depressive symptoms.

Primary outcomes for our pilot study focused on smoking reduction and cessation. We found a significantly greater proportion of CBT participants reduced smoking by at least 50% compared to CG participants at EOT. Smoking reduction is important given that many college students, including some in the present sample, are not interested in quitting immediately. Further, spontaneous reduction is rare, and those who do reduce appear able to maintain reductions.<sup>25</sup> In addition, smoke exposure decreases for those who reduce,<sup>25</sup> and reduction predicts likelihood of future cessation.<sup>26</sup> Unfortunately, few smokers quit in our study at EOT and follow-up. It is possible that the effects of reduction on future cessation occur over a longer period of time than was assessed in our study. It is also possible that the smoking reduction among CBT participants builds self-efficacy over time and results in increased quit attempts, which in turn increases the likelihood of cessation.

Although group differences in smoking reduction and cessation were not significant at 3 or 6 mo FU, reductions were largely maintained by the CBT group. Whereas reductions in the CBT group remained fairly consistent, smoking reductions increased for CG participants over time. Patten et al.<sup>22</sup> found similar results such that abstinence rates in the CBT group were significantly higher than standard behavioral counseling at end of treatment and 12-month follow-up, but not at 3-month follow-up. The lack of group differences in reduction

at follow-up should be attended to in future studies. For example, it would be helpful to attain longer follow-up outcomes (e.g., at 12 and 24 months) to evaluate the effectiveness of CBT over time. In designing future variations of group-based treatments for smoking similar to the one described here, it may prove beneficial to include “booster sessions” after the intervention is completed to help those who reduced maintain reductions and to provide additional help toward quitting. The lack of persisting group differences in the present study may also suggest the need for more specific discussion of relapse prevention in the intervention. This discussion could specifically focus on maintaining reduction and developing strategies designed to minimize the likelihood of return to prior smoking levels.

For our secondary outcomes, motivation and confidence to reduce did not differ significantly for CBT and CG participants at any of the time points. At the same time, however, the treatment by time interaction effect at EOT approached significance ( $p=.090$ ) and if we would've chosen a less conservative p-value ( $p<.10$ ), which is common in pilot studies, it would have been a significant effect. In a study with a larger sample size, this trend toward significance may become significant at the  $p<.05$  level. The medium to large effect size of the interaction term ( $\eta_p^2=.106$ , where .02, .06, and .14 represent small, medium, and large effect sizes<sup>37</sup>) is noteworthy and indicates that approximately 11% of variation in changes in motivation and confidence to reduce smoking is attributed to the group difference. This is a meaningful contribution in social sciences research and should be further investigated in future studies. Univariate analyses show that this trend toward significance is largely driven by group differences in confidence to reduce smoking. Specifically, there was a trend for CBT participants' confidence to reduce smoking increasing from baseline to EOT and decreasing for CG participants. Confidence to change smoking behavior is similar to ‘quitting self-efficacy’ which is related to initiation of quit attempts,<sup>38</sup> intention to continue smoking,<sup>39</sup> and stage of change.<sup>40</sup> Furthermore, self-efficacy may predict relapse after cessation.<sup>41</sup> Therefore, it is important to bolster smokers' confidence to change their behavior. Increasing confidence may be especially vital for smokers with low mood given that current depression demonstrates an association with lower smoking cessation self-efficacy.<sup>42</sup>

The increased reductions in smoking witnessed in the CG participants at 3 and 6 mo FU and the main effect for time for motivation to reduce at EOT indicated that there might be some benefit to participating in a health-focused group. Indeed, another study among college students failed to find group differences in cessation between MI interventions focused on smoking versus healthy eating in infrequent smokers.<sup>11</sup> However, it is important to point out that significant reduction ( 50%) at EOT occurred with the extra attention paid to smoking behavior provided by the CBT group.

Given that this is a new treatment in an understudied population, our findings for high treatment satisfaction are noteworthy. Although our sample was not seeking treatment, we had relatively good treatment attendance, an experience that predicted cessation among college students in another study.<sup>11</sup> Over half (61%) of CBT participants found the group helpful for quitting smoking and almost all (91%) found it helpful for reducing smoking. The promise of this pilot intervention for future use was rated highly; all participants said they would recommend the group to a friend and nearly 80% reported they would return to the group in the future if they wanted to change their smoking. Thus, the present intervention was useful for reducing smoking and was well-received by our non-treatment seeking sample of college smokers.

## Limitations

Although our study was the first to evaluate a multi-component treatment among college smokers with elevated depressive symptoms, there are a few limitations to note. This was a



pilot study with a relatively small sample size intended to evaluate the intervention's promise before conducting a larger scale study. Despite our small sample we observed a significant result for smoking reduction at EOT. Related to sample demographics, our study was conducted at a single site, and the majority of participants were White and early on in their college careers. After White, the second largest racial/ethnic grouping was Asian/Pacific Islander. This group included too few participants to permit analysis of the intervention's effectiveness across diverse groups. Essentially, it is unclear whether the present results would be observed among more ethnically diverse samples, and therefore, generalization of the present results should be done with caution. In order to maximize the external validity of similar follow-up work, future investigations should examine more diverse groups of participants. In addition, future studies could investigate which components (behavioral, mood management, or motivational) of the intervention are important for smoking reduction and increases in confidence. Most of the present participants evidenced depressive symptoms of mild severity. Replication of the present study in a sample of clinically depressed participants would strengthen our findings' external validity and allow more definitive conclusions about syndromal depression. Nonetheless, we agree with others<sup>43</sup> who argue that mild depressive symptomatology exists on a continuum with major depressive disorder and, thus, inform research on major depressive episodes. Finally, it is not possible to biochemically confirm smoking cessation over a 30-day period. It should be noted that our results were based on self-report and that we used saliva samples to help increase the accuracy of reporting and to confirm 7-day quit attempts.

## Conclusions

Despite these limitations, our study shows promising evidence for the utility of this multi-component treatment for smoking reduction among an understudied population of college smokers with elevated depressive symptoms. Our observation of behavior change in these smokers is significant, particularly given that they were not treatment seeking and relatively non-motivated to quit immediately. The considerable smoking reductions found in our CBT group also have high clinical significance because reducing smoking may lower morbidity and lead to future smoking cessation.

## Acknowledgments

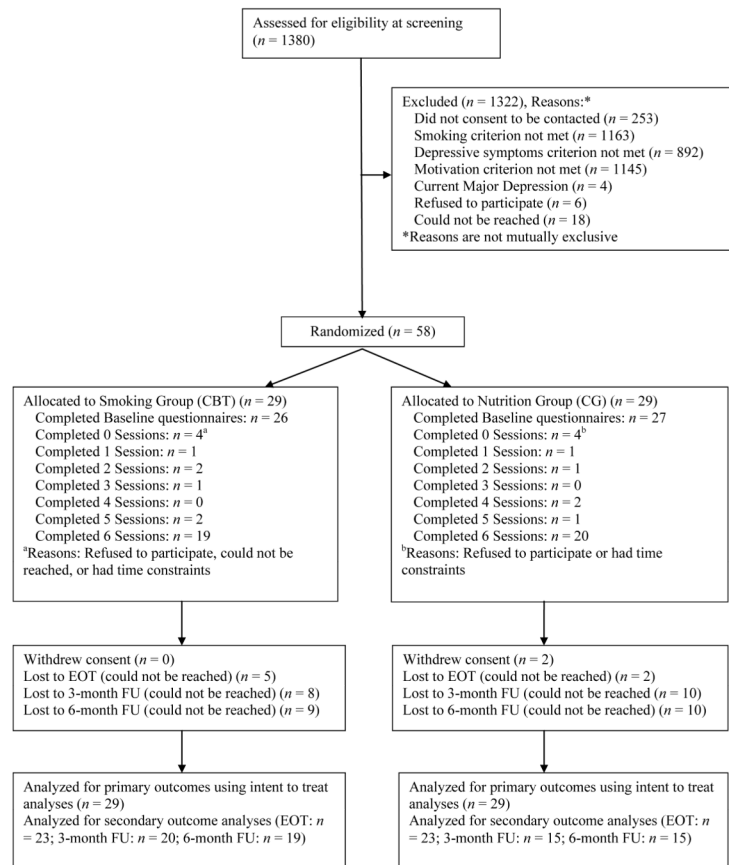
This work was supported by NIDA (F31DA023738, PI: Schleicher) and The University of Montana. The content is solely the responsibility of the authors and does not necessarily represent the official views of NIDA or NIH.

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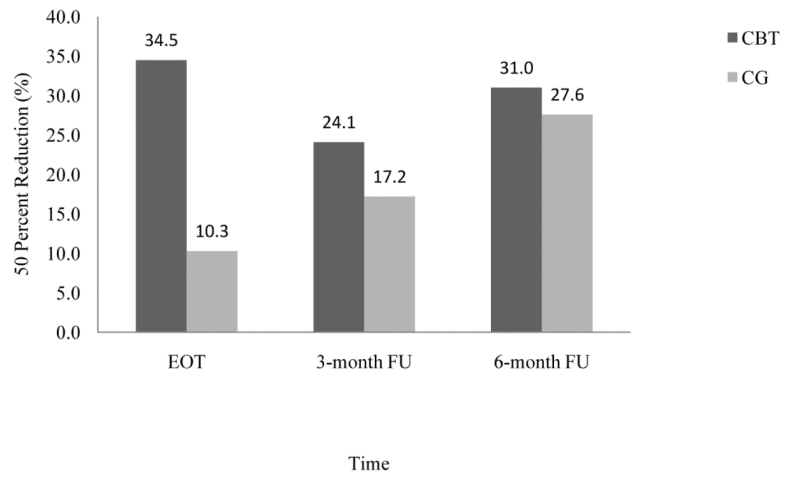
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**Figure 1.** Participant CONSORT flowchart. CBT = Combined Behavioral Counseling, Mood Management, and Motivational Enhancement Intervention; CG = Control Group.



**Figure 2.** Proportion of participants reducing smoking by 50% by treatment group and time. CBT = Combined Behavioral Counseling, Mood Management, and Motivational Enhancement Intervention; CG = Control Group.

**Table 1**  
**Means and Standard Deviations for Secondary Outcome Measures by Treatment Group**

Secondary Outcome Measures	Total <sup>a</sup> ( <i>n</i> = 46, EOT) ( <i>n</i> = 35, 3-month) ( <i>n</i> = 34, 6-month)	Intervention Group	
		CBT ( <i>n</i> = 23, EOT) ( <i>n</i> = 20, 3-month) ( <i>n</i> = 19, 6-month)	CG ( <i>n</i> = 23, EOT) ( <i>n</i> = 15, 3-month) ( <i>n</i> = 15, 6-month)
Motivation to Reduce			
Baseline	6.65 (2.89)	7.13 (2.80)	6.17 (2.96)
EOT	8.15 (2.78) <sup>b</sup>	8.70 (2.31)	7.61 (3.15)
3-month	8.20 (2.68)	8.60 (2.56)	7.67 (2.82)
6-month	8.06 (3.20)	8.32 (3.25)	7.73 (3.22)
Confidence to Reduce			
Baseline	7.87 (2.45)	7.78 (2.43)	7.96 (2.51)
EOT	8.33 (2.85)	9.09 (2.02)	7.57 (3.36)
3-month	8.46 (1.92)	8.60 (1.64)	8.27 (2.28)
6-month	8.79 (2.01)	8.16 (2.43)	9.60 (0.82)

Note.

<sup>a</sup>Total sample excludes from EOT analyses 12 participants who did not complete any treatment sessions (*n*=3), did not provide EOT data (*n*=4), or did not complete sessions and did not provide EOT data (*n*=5); excludes from 3-month FU analyses 23 participants who did not complete any treatment sessions (*n*=3), did not provide 3-month FU data (*n*=15), or did not complete sessions and did not provide 3-month FU data (*n*=5); and excludes from 6-month FU analyses 24 participants who did not complete any treatment sessions (*n*=3), did not provide 6-month FU data (*n*=16), or did not complete sessions and did not provide 6-month FU (*n*=5).

<sup>b</sup>Significant main effect for time.