



## Reducing alcohol consumption to minimize weight gain and facilitate smoking cessation among military beneficiaries



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### HIGHLIGHTS

- Tested smoking cessation intervention stressing less alcohol use to minimize weight gain.
- Intervention designed for military beneficiaries.
- Experimental group had higher cessation rate at 3 months but not at 6 or 12 months.
- Drinking reduction did not account for the higher cessation rate at 3 months.
- Evidence-based methods to sustain smoking cessation are needed.

### ARTICLE INFO

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### ABSTRACT

**Introduction:** Smoking cessation-related weight gain can have significant negative health and career consequences for military personnel. Alcohol reduction combined with smoking cessation may decrease weight gain and relapse.

**Method:** A randomized clinical trial of military beneficiaries compared a standard smoking cessation (i.e., brief informational) intervention ( $N = 159$ ), with a brief motivational smoking cessation intervention that emphasized reduced drinking to lessen caloric intake and minimize weight gain ( $N = 158$ ).

**Results:** Participants who received the motivational intervention were significantly more likely to quit smoking at the 3-month follow-up ( $p = 0.02$ ), but the differences were not maintained at 6 ( $p = 0.18$ ) or 12 months ( $p = 0.16$ ). Neither weight change nor alcohol reduction distinguished the 2 groups. Smoking cessation rates at 12 months (motivational group = 32.91%, informational group = 25.79%) were comparable to previous studies, but successful cessation was not mediated by reduced drinking.

**Conclusions:** Alcohol reduction combined with smoking cessation did not result in decreased weight gain or improved outcomes.

### 1. Introduction

Tobacco use is the largest preventable cause of mortality and morbidity in the United States (U.S. Department of Health and Human

Services, 2010), accounting for > 480,000 deaths each year (Centers for Disease Control and Prevention, 2015). Although the general public is aware that cigarette smoking causes many serious health consequences (U.S. Department of Health and Human Services, 2010), in

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2014 16.8% of all adults in the U.S. smoked cigarettes (Centers for Disease Control and Prevention, 2015).

The Institute of Medicine (2009) found that among military personnel cigarette smoking is related to multiple health problems; it affects military readiness, the capability to perform missions or functions, in many ways (e.g., physical and cognitive impairments, increased absenteeism from work, complicated recovery from injuries); and it is related to personnel dropping out of military training. In 2011, although the Air Force had a significantly lower smoking prevalence than the other service branches (17.2% smoked over the past 30 days versus 24.0% for all services combined; Department of Defense, 2013), smoking continued to be a major problem in terms of readiness.

One major impediment to quitting smoking in the military is weight gain (Institute of Medicine, 2009). Spring et al. (2009) in a meta-analysis found that adding behavioral weight control interventions did not increase long-term smoking cessation rates. However, concern with weight gain might be more important to a military population. In a study of active duty Air Force members who stopped smoking, the average weight gain was 5.5 lb for men and 9.8 lb for women (Peterson & Helton, 2000). Air Force personnel on active duty have a special concern in that excessive abdominal circumference could potentially lead to separation from the service (Department of the Air Force, 2013). Thus, smoking presents military personnel with a serious dilemma (i.e., smoking impairs health, but weight gain can end a career).

There is a relationship between smoking and alcohol consumption (Falk, Yi, & Hiller-Sturmhofel, 2006). A 2011 report found that 28.1% of Air Force personnel reported having had at least one binge-drinking day ( $\geq 5$  drinks for men,  $\geq 4$  drinks for women) during the past 30 days (Department of Defense, 2013). Among current smokers, the rate of heavy drinking ( $\geq 1$  binge day/week) ranged from 15.4% for infrequent smokers to 17.9% for heavy smokers. The average number of calories per typical alcoholic drink ranges from 100 to 200 (National Institute on Alcohol Abuse and Alcoholism, 2010). Because 3500 cal result in 1 lb of body weight (Ades, Savage, & Harvey-Berino, 2010), alcohol consumption can add to weight gain for many who stop smoking.

This study investigated a Smoking Cessation Plus (SCP) intervention designed to minimize weight gain by reducing alcohol consumption to assist in achieving smoking cessation, compared to a Standard Smoking Cessation (SSC) intervention in a randomized controlled trial (RCT). The SCP intervention had several components typical of cognitive-behavioral smoking interventions such as stimulus control, psychoeducation, understanding the functions served by smoking, and identifying alternative behaviors that could be used to avoid or cope with smoking cues. The SSC intervention was intended to serve as an approximation to a normal standard of care for smokers seen in primary care centers. The typical primary care response for individuals identified as smokers in most cases would involve only a suggestion to stop smoking. However, because individuals would have volunteered to participate in a smoking cessation study, we felt we had an ethical obligation to provide a minimal intervention directed at smoking cessation. Because nicotine replacement therapy and bupropion (Zyban) would be available to any patient requesting them, they were made available to all participants in the study.

Participants were recruited from military primary care settings. The Centers for Disease Control and Prevention (2010) estimated that 55.5% of all office visits to physicians were to primary care physicians, and nearly all active duty Air Force personnel visit their primary care provider annually. Air Force active duty personnel, retirees, and their adult family members who smoked cigarettes and who were regular consumers of alcoholic beverages were eligible to participate in the study.

It was hypothesized that participants in the SCP group would demonstrate a higher rate of smoking cessation than the SSC group, mediated by a reduction in alcohol consumption. It was also

hypothesized that the SCP group would have a lower relapse rate.

## 2. Methods

### 2.1. Study design

Blocked by gender, participants were randomly assigned to one of two intervention groups: (a) Smoking Cessation Plus (SCP), which included an emphasis on weight management through alcohol reduction; or (b) Standard Smoking Cessation (SSC). The literature suggests that females are more likely than males to be concerned about weight gain as a side effect of tobacco cessation, and women typically consume less alcohol than men (Wilsnack, Wilsnack, Kristjanson, Vogeltanz-Holm, & Gmel, 2009). The SCP intervention, conducted over 6 weeks, involved two 30-minute, face-to-face sessions with a behavioral health provider and two 20-minute phone contacts. Participants in the SSC intervention received a self-help pamphlet discussing effective behavioral change strategies for tobacco cessation, including use of NRT and Zyban, how to minimize weight gain, the value of reducing alcohol use, and how to prevent and/or deal with relapses. Participants in both groups also received nicotine replacement therapy (NRT) and bupropion SR (Zyban) if requested. The study was approved by the Institutional Review Boards of Nova Southeastern University and the Wilford Hall Medical Center.

### 2.2. Participants

Participants were recruited during 2006 to 2008 from military primary care centers in the San Antonio, Texas, area. Potential participants learned about the study through referrals from staff or from fliers posted at the centers. Eligibility criteria were: (a) regular smokers of cigarettes ( $\geq 5$ /day during past year), (b) have a carbon monoxide (CO) level of  $\geq 8$  ppm when screened, (c) 21–75 years of age, (d) interested in quitting and willing to set quit date within 6 weeks, (e) concerned about weight gain as a consequence, (f) on average consuming  $\geq 4$  drinks per week (1 standard drink = 0.6 oz. or 14 g ethanol), (g) not currently in other smoking cessation programs, and (h) expected to remain local for  $\geq 1$  year. Exclusion factors were (a) pregnant, trying to become pregnant, or breastfeeding; (b) health problems that would contraindicate the use of NRT or Zyban; (c) had used weight-loss medications during the previous 6 months; (d) currently or at least twice within the past 5 years treated for an alcohol use disorder; (e) diagnosed with recurrent or major depression in the past 6 months; (f) answered “yes” to suicidality question on the Physical Health Questionnaire-9 (PHQ-9; Spitzer, Kroenke, & Williams, 1999); or (g) currently in a basic or technical training program (smoking disallowed). Individuals with a history of major depression were excluded because these individuals have a reduced likelihood of stopping smoking (Fiore et al., 2008) and increased risk of a major depressive episode following cessation (Hall, Muñoz, Reus, & Sees, 1993).

Fig. 1 presents a CONSORT diagram of participant flow into the study, including the follow-up. A total of 317 participants, blocked by gender, were randomly assigned to one of two treatments (SCP:  $n = 158$ ; SSC:  $n = 159$ ).

### 2.3. Measures

A brief screening questionnaire identified potential participants for further assessment if they (a) were over the age of 21, (b) planned to stay in the local area for  $\geq$  one year, (c) smoked an average of  $\geq 5$  cigarettes per day for the past year, (d) would be concerned by a weight gain of 5 lb when stopping smoking, and (e) had consumed an average of  $\geq 4$  standard drinks per week. The further assessment was conducted at the beginning of the first counseling session. A baseline questionnaire gathered demographic and smoking history data including the Fagerström Test for Tobacco Dependence (Heatherton, Kozlowski,

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