



## Short Communication

## Environmental tobacco smoke exposure among smokers and non-smokers receiving outpatient substance abuse treatment

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## HIGHLIGHTS

- Cross-sectional survey of participants in outpatient substance abuse treatment
- ETS exposure and smoking policies in different environments were examined.
- We predicted what variables impact smoking policies in the home.
- We identified what work environments may impede smoking cessation.

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## ABSTRACT

**Introduction:** Environmental Tobacco Smoke (ETS) has been linked to numerous health problems. While research has demonstrated high prevalence of tobacco use among individuals receiving treatment for substance use disorders (SUDs), no studies have examined ETS among individuals receiving treatment for SUDs, paying specific attention to non-smokers who may be at risk for high exposure to ETS.

**Methods:** Participants (N = 261) enrolled in outpatient substance abuse treatment completed a survey, in which 14 items were used to quantify ETS exposure and smoking policies across several environments.

**Results:** Among smokers, 85% reported that their significant others also smoked as compared to 15% among non-smokers ( $\chi^2 = 6.624, p < .05$ ). A logistic regression examined the characteristics that predicted smoking in the home. The overall model was significant, ( $\chi^2 = 36.046, p < .0005$ ) with variables that independently predicted smoking in the home included having less than a high school diploma, being female, and living with a smoker. Income, age, and living with children were not found to be significant. Overall, 42% white collar workers 26% of service workers and 30% of blue collar workers reported no exposure to ETS. Sixty-seven percent of smokers strongly agreed or agreed that the hazards of secondhand smoke have been clearly demonstrated versus 58% of non-smokers.

**Conclusions:** Smokers and non-smokers enrolled in outpatient substance abuse treatment are frequently exposed to ETS at home, work, and in social settings. The dangers of ETS should be addressed among this population through education, smoke-free policies, and cessation resources, with help from their treatment facility.

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## 1. Introduction

The hazards of environmental tobacco smoke (ETS; i.e., smoke emanating from the cigarette and exhaled smoke) have been well documented (CDC, 2011; HHS, 2006; Kegler et al., 2012). While research has largely focused on ETS exposure in vulnerable and non-smoking

populations (Florescu et al., 2007; Pirkle, Bernert, & Caudill, 2006; Singh, Siahpush, & Dogan, 2010), no studies have examined ETS exposure and home and work smoking policies among individuals receiving treatment for substance use disorders (SUDs). ETS is important to examine among SUD treatment patients as these individuals may have characteristics that predict high levels of ETS exposure and elevated risks, which include low levels of education, living in disadvantaged neighborhoods (Galea, Nandi, & Vlahov, 2004) and employment in blue collar or service industry jobs (Walls, Batiste, Moore, & Loy, 2009). Smoking prevalence among SUD treatment patients is common (75–97%) and well above rates found in the general population of the

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U.S. (19.5%) (Centers for Disease Control and Prevention (CDC), 2011; Gudyish, Tajima, Chan, Delucchi, & Ziedonis, 2011; Kalman, 1998; Nahvi, Richter, Li, Modali, & Arnsten, 2006; Pajusco et al., 2012). Despite this, little attention has been given to the vulnerability to ETS exposure for these individuals both in their treatment environments and at work and home, as well as ETS conditions that may make smoking cessation more difficult. The present study addresses this gap in the literature by exploring ETS exposure among SUD treatment patients across several environments and comparing ETS exposure and characteristics between smokers and non-smokers.

## 2. Methods

### 2.1. Participants and procedures

After receiving Institutional Review Board approval, participants (N = 266) were recruited from eight urban, outpatient substance abuse treatment centers in Baltimore, MD through flyers, informational sessions held by study staff, and word of mouth. Eligible study participants were 18 years of age and older and enrolled in outpatient substance abuse treatment. The survey was administered via the internet using Survey Monkey encryption service or by paper and pencil. Participants received a small prize or \$5 for completing the survey. Information on recruitment and other study details can be found elsewhere (McClure, Acquavita, Harding, & Stitzer, 2013). Five participants failed to give adequate information regarding their ETS exposure, and were excluded from the analyses, resulting in a final sample of N = 261 for the current analysis. Participants were divided for purposes of analysis into current smokers (N = 201) and non-smokers (N = 60) based on self-report.

### 2.2. Measures

The survey consisted of 133 questions, 11 of which were devoted to ETS exposure and home and work smoking policies. Participants' smoking status was determined by asking the following question: "Do you currently smoke cigarettes? Answer: Yes, I currently smoke; No, I quit within the last 6 months; No, I quit more than 6 months ago; No, I have never smoked." Additional smoking characteristics were asked such as number of cigarettes per day and Fagerström Test for Nicotine Dependence (FTND) (Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991) was asked of participants. Information on desire to quit is reported elsewhere (McClure, Acquavita, Dunn, Stoller, & Stitzer, 2014).

Four of the 11 questions to quantify ETS exposure were locally developed. These questions were:

- 1) Who smokes in your home? Answer: Spouse/partner, mother, father, sister, brother, children, friend, other family member(s), other non-family, not applicable.
- 2) How is cigarette smoking handled in your home? Answer: No one is allowed to smoke in my home, only special guests are allowed to smoke in my home, people are allowed to smoke only in certain areas of my home, people are allowed to smoke anywhere in my home.
- 3) How many days during the past 7 days were you near someone while he/she was smoking a cigarette?
- 4) For your most recent job, does your place of work have an official policy that restricts smoking in any way? Answer: Yes, No, Don't know.

The remaining seven items to assess ETS exposure examined home, work, and social ETS exposure. These items were previously developed, utilized and found to be a valid measure of ETS exposure by Nondahl, Cruickshanks, and Schubert (2005).

Additionally, questions from the Smoking, Knowledge, Attitudes, and Services Questionnaire (S-KAS; Gudyish, Tajima, et al., 2011)

obtained via the current survey are reported elsewhere in aggregate (McClure et al., 2014), but four questions were examined individually due to the applicability to ETS exposure. Questions studied were:

- 1) Do clients and staff smoke together? Answer: Yes, No
- 2) In the program you are currently at, did any staff member ask if you smoke? Yes, No, Don't Remember
- 3) In the past month, how frequently did your clinician remind you not to smoke in the presence of infants or children? Answer: Never, Occasionally, Often, Very Often, Always, Don't Know, Not Applicable. (Smokers only)
- 4) What is your level of agreement or disagreement with the following statement: The hazards of second-hand smoke have been clearly demonstrated. Answer: Strongly disagree, Disagree, Unsure, Agree, Strongly Agree, Don't Know.

Demographic, SUD treatment characteristics, and ETS exposure characteristics of the study sample were compared between smokers (N = 201) and non-smokers (N = 60) with the use of Chi square tests for categorical variables and independent samples t-tests for continuous variables. Logistic regression of 250 participants with no missing data in the variables utilized was conducted to examine the characteristics that predicted smoking in the home (no smoking in the home/yes smoking in the home) among smokers and non-smokers. Variables used in this regression were gender (male/female), income (<\$15,000/≥\$15,000), education (<High School Diploma/≥ High School Diploma), age (continuous), living with children (yes/no), and living with a smoker (yes/no). All tests were conducted in SPSS version 20.

## 3. Results

Demographic information for the study sample is represented in Table 1 separated by smokers and non-smokers. The majority of participants (N = 261) were male (64%), African-American (69%), did not live with children (78%), were previous opioid users (55%), and current smokers (76%). The average age for both smokers and non-smokers was 44 years (SD = 11.46). Half of non-smokers reported they had never smoked at all, 22% reported they quit within the last six months and 28% reported that they had quit more than six months ago. The average amount of cigarettes smoked per day was approximately 12. The average FTND score calculated for participants who answered all six items was 4.6. Participants reported their employment pattern over the past three years, and provided information on their last most recent job (i.e., blue collar, white collar, service), which is shown in Table 1. For current employment patterns, 29% reported having a full time job, 25% reported being unemployed, 17% were retired or disabled, 17% reported working part time, 9% reported being unable to work due to being in a controlled environment, and 3% were students.

Potential ETS risk characteristics of the study sample are shown in Table 2. Smokers compared with non-smokers were less likely to have a high school diploma and were more likely to use opioids. No other demographic differences existed between smokers and non-smokers. Among current smokers, 85% reported that their significant other smoked, which was the case for 15% of non-smokers. Smokers were also more likely to report living with people who smoked (parents, etc.) as compared to non-smokers.

Ninety-seven percent of smokers reported ETS exposure within the past seven days and 81% experienced exposure in a social setting once a week or more. Eighty percent reported their average ETS exposure as 1 h or more. Six people were smoking, on average, during those times of social exposure (SD = 3.6). Among non-smokers, 83% reported ETS exposure within the past seven days, and 62% experienced exposure in a social setting once a week or more. Sixty-five percent reported their average ETS exposure as less than 1 h. Five people were smoking, on average, during these times of social exposure (SD = 3.3).

A non-smoking policy in the home was endorsed by 35% of smokers and an additional 35% reported that smoking was only allowed in

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