



Effects of Disasters on Smoking and Relapse: An Exploratory Study of Hurricane Katrina Victims

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ABSTRACT

Background: Psychosocial stress maintains cigarette use and precipitates relapse, but little is known about how natural disasters in particular affect smoking. **Purpose:** To determine the feasibility of recruiting victims soon after a natural disaster for a survey study, and to assess the types and determinants of changes in smoking behavior resulting from exposure to the disaster. **Methods:** A convenience sample of 35 Hurricane Katrina refugees who had smoked more than 100 cigarettes in their lifetime were surveyed one month after the storm to evaluate changes in smoking behavior. **Results:** Among a small sample of former smokers, more than half relapsed after Katrina, citing stress, urge, and sadness. Among current smokers, 52% increased their smoking after Katrina by more than half a pack per day on average. Most individuals who increased their smoking or relapsed expressed interest in receiving cessation assistance within the next month. **Discussion:** Stress-related increases in smoking and relapse may be common after a natural disaster. **Translation to Health Education Practice:** Health education professionals have an important role to play in responding to changes in tobacco use in the aftermath of disasters. Educational interventions to discourage tobacco use as a coping strategy may be especially warranted given the high level of interest expressed in smoking cessation.

BACKGROUND

Millions of people in the U.S. are affected each year by natural disasters, such as earthquakes, floods, hurricanes, tornados, and wildfires. Distress from these events is linked to psychological disorders such as depression and post-traumatic stress disorder (PTSD).¹⁻³ Population-based studies after “human-made” disasters in Oklahoma City in 1995 and Manhattan post-September 11 found increased use of alcohol and marijuana, particularly among those most directly affected by the attacks.^{4,5}

Cigarette smoking is a common form of substance use that is strongly related to stress and negative affect⁶ and would be expected to increase following disasters. Smokers often report engaging in the habit to reduce tension, especially in stressful situations.^{7,8}

Perceived stress predicts failure to quit smoking^{9,10} as well as relapse.^{11,12}

Little data is available on the impact of disasters on smoking and relapse. After the 1995 terrorist bombing in Oklahoma City, Smith et al. (1999) found that 29% of the city’s smokers reported increasing the amount they smoked, compared to 15% of residents in a comparison city. Likewise, increases in smoking were observed after September 11 among Manhattan residents living near Ground Zero. Five to eight weeks after the attack, 10% reported smoking more cigarettes per day, and this increase remained stable for 6-9 months.^{13,14} Only one study has examined how exposure to natural disasters affects smoking. Increased smoking among a cohort of young adults in Australia was associated with greater exposure to a series of bushfires.¹⁵

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PURPOSE

Given the paucity of data on this issue, we conducted an exploratory survey study to determine whether there was evidence of changes in smoking behavior among adults affected by a recent natural disaster in the U.S. (Hurricane Katrina). We were especially interested in the feasibility of surveying this population and the nature of changes in smoking behavior resulting from exposure to the disaster (e.g., increased rate of smoking among current smokers; relapse among former smokers).

METHODS

For this exploratory study, non-probability-based sampling was used to obtain a sample of Hurricane Katrina evacuees in the Memphis metro area during late summer 2005. To develop the survey instrument, the investigative team collectively decided on relevant variables to be collected, based on the extant literature pertaining to determinants of smoking and relapse,^{16,17} including stressor exposure.⁴⁻¹⁵ To measure these variables, we selected single- or multi-item instruments that were widely used in the research literature and, whenever possible, had demonstrated reliability and validity. Included were items from the Behavioral Risk Factor Surveillance System (BRFSS)¹⁸ to assess sociodemographic characteristics, current and past smoking status, frequency of smoking, factors contributing to relapse,¹⁹ and readiness to quit.²⁰ Item wording was slightly adapted to provide reference to Hurricane Katrina (e.g., “*Since Katrina hit, have you smoked a cigarette, even a puff?*”). The survey was pilot-tested for understanding and readability and was deemed to be exempt by the University of Memphis Institutional Review Board.

Three of the investigators—master’s- and doctoral-level researchers with experience in standardized survey administration—collected all data. The principal investigator conducted a two-hour training session with the three interviewers to review the survey content and practice administration procedures. One month after Katrina, the 19-item survey was administered over a 7-day period

at local shelters and the Tennessee Emergency Management Agency (TEMA) relief agencies.¹

After receiving approval from the local shelters and relief agencies, the interviewers were directed by facility personnel to specific recruitment locations. Surveying was conducted at each facility at different times on multiple days in order to sample as broad a range of evacuees as possible. All evacuees who were present were approached by the surveyors, who discretely asked individuals if they had smoked at least 100 cigarettes in their lifetime. If they responded affirmatively and were willing to answer a few questions in an anonymous survey, the surveys were then either interview-administered or self-administered, depending on the participant’s preference. The data was analyzed using SPSS Version 14.0. (Note: The survey is available upon request from Dr. Ward.)

RESULTS

Approximately 75 evacuees were approached. None refused to disclose whether they had ever smoked cigarettes, 40 individuals were never smokers, and 35 responded affirmatively to having smoked at least 100 cigarettes in their lifetime; of these 35, all agreed to complete the survey. Of the 35 participants, 34 were from Louisiana and one was from Mississippi; 57% were women; 63% were African American; and ages ranged from 29 to 65 years. Seven of the respondents were former smokers who had quit an average of 13 months prior to the survey (range of 2 months to 2 years). Of these former smokers, four relapsed after Katrina. The most frequently cited reasons for relapse were stress, urge/craving, and sadness/depression. Among the 28 individuals who were smokers at the time of survey administration, 27 provided details regarding the total number of cigarettes both before and after Katrina. There was a significant increase in the number of cigarettes smoked per day ($p < .026$), with 52% ($n=14$) reporting that they had increased their smoking since Katrina. On average, these individuals increased their smoking by over half a pack (12.6 cigarettes) per

day. Eighty-one percent of those surveyed expressed interest in receiving cessation assistance within the next month.

DISCUSSION

We observed substantial changes in smoking behavior in the month following Hurricane Katrina among a convenience sample of adults who were displaced to a new city. More than half of those who smoked at the time of the hurricane reported increasing the number of cigarettes they smoked each day, by an average of more than half a pack. In addition, more than half of former smokers relapsed during the month after the hurricane, which they attributed primarily to the distress created by this disaster.

Our finding that 52% of smokers increased the amount smoked during the month after the hurricane is a much higher increase than that observed in the aftermath of two “human-made” disasters; 29% of smokers in Oklahoma City had increased their smoking rate 4-5 months after the bombing,⁴ and 10% of lower Manhattan residents had increased their smoking 5-8 weeks after September 11,^{13,14} with this increase being maintained 6-9 months after the disaster.^{13,14} Of course, the differences in sampling strategies used in the current and previous studies (non-probability vs. probability-based, respectively) preclude making direct comparisons of the results, and we cannot rule out error due to small sample size or selection bias. However, to the extent that subjects in our convenience sample are similar to the population of individuals displaced by Hurricane Katrina, increases in amount smoked and high rate of relapse may reflect the considerable distress experienced by victims of this disaster.

This exploratory study was conducted in order to examine the feasibility of conducting a large-scale population-based survey study to quantify the effect and time course of exposure to natural disasters on smoking and relapse, and to examine mediators such as depression and PTSD. This study provided formative data that was very useful in this regard. First, we discovered that hurricane victims (at least those who were displaced to a



new city by the disaster) were very willing to participate in a brief survey study. All of the hurricane victims approached were willing to participate, and most, if not all, seemed pleased to share their experiences, especially since it was for research purposes aimed at helping other disaster victims. This finding suggests the feasibility of recruiting victims of hurricanes and other natural disasters to conduct health-related surveys. Second, this formative project was instrumental in highlighting some of the specific smoking-related behaviors that may be affected by exposure to a natural disaster, including amount smoked (for current smokers) and relapse (for former smokers). Thus, both current and former smokers should be targeted in future research. Third, this study provided clues to several contributing factors for relapse that should be investigated in larger, population-based studies, including negative affect, perceived stress, and abstinence symptoms (urge/craving). Last, this formative project revealed that interest in quitting was very high among both relapsed smokers and those who had increased their smoking. Future studies should investigate intervention strategies to prevent increases in tobacco use and relapse.

TRANSLATION TO HEALTH EDUCATION PRACTICE

This exploratory data suggests that changes in smoking behavior, including both relapse among former smokers and increases in daily smoking rate by current smokers, may be common coping responses following exposure to disasters. More encouraging, however, was the finding that a majority of smokers in our sample expressed interest in making a cessation attempt within the next month. These results need to be confirmed in large, representative samples of disaster victims. If confirmed, health educators have a clear role to play in efforts to reduce tobacco use among disaster victims. For example, brief psycho-educational interventions could be developed and incorporated into relief services provided by such organizations as the Red Cross. Such interventions might target relapse prevention and early

recovery from a slip by providing normative information about the role of stress in smoking, coping skills training, behavioral cessation strategies, and pharmacotherapy when indicated. Much remains to be learned to successfully prepare health education professionals to respond to smoking and use of other substances in the aftermath of disasters.

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REFERENCES

- Green BL. Evaluating the effects of disasters. *Psychol Assess.* 1991;3:538-546.
- Norris FH. Epidemiology of trauma: frequency and impact of different potentially traumatic events on different demographic groups. *J Consult Clin Psychol.* 1992;60:409-418.
- Smith EM, North CS, McCool RE, et al. Acute postdisaster psychiatric disorders: identification of persons at risk. *Am J Psychiatr.* 1990;147:202-206.
- Smith DW, Christiansen EH, Vincent R, et al. Population effects of the bombing of Oklahoma City. *Journal of the Oklahoma State Medical Association.* 1999;92:193-197.
- Vlahov D, Galea S, Resnick H, et al. Increased use of cigarettes, alcohol, and marijuana among Manhattan, New York, residents after the September 11th terrorist attacks. *Am J Epidemiol.* 2002;155:988-996.
- Kassel JD, Stroud LR, Paronis CA. Smoking, stress, and negative affect: correlation, causation, and context across stages of smoking. *Psychol Bull.* 2003;129:270-304.
- Ikard FF, Green DE, Horn D. A scale to differentiate between types of smoking as related to the management of affect. *Int J Addict.* 1969;4:649-659.
- Pomerleau O, Adkins D, Pertschuk M. Predictors of outcome and recidivism in smoking cessation treatment. *Addict Behav.* 1978;3:65-70.
- Carey MP, Kalra DL, Carey KB, et al. Stress and unaided smoking cessation: a prospective investigation. *J Consult Clin Psychol.* 1993;61:831-838.
- McCormick MC, Brooks-Gunn J, Shorter T, et al. Factors associated with smoking in low-income pregnant women: relationship to birth weight, stressful life events, social support, health behaviors and mental distress. *J Clin Epidemiol.* 1990;43:441-448.
- Cohen S, Lichtenstein E. Perceived stress, quitting smoking, and smoking relapse. *Health Psychol.* 1990;9:466-478.
- Swan GE, Denk CE, Parker SD, et al. Risk factors for late relapse in male and female ex-smokers. *Addict Behav.* 1988;13:253-266.
- Vlahov D, Galea S, Ahern J, et al. Consumption of cigarettes, alcohol and marijuana among New York residents six months after the September 11th terrorist attacks. *Am J Drug Alcohol Abuse.* 2004a;30:385-407.
- Vlahov D, Galea S, Ahern J, et al. Sustained increased consumption of cigarettes, alcohol, and marijuana among Manhattan residents after September 11th, 2001. *Am J Publ Health.* 2004b;94:253-254.
- Parslow RA, Jorm AF. Tobacco use after experiencing a major natural disaster: analysis of a longitudinal study of 2063 young adults. *Addiction.* 2006;101:1044-1050.
- Ward KD, Klesges RC, Halpern MT. Predictors of smoking cessation and state-of-the-art smoking interventions. *Journal of Social Issues.* 1997;53:129-145.
- Ward KD, Klesges RC, Zbikowski SM, et al. Gender differences in the outcome of an unaided smoking cessation attempt. *Addictive Behaviors.* 1997;22:521-533.
- Centers for Disease Control and Prevention. *Behavioral Risk Factor Surveillance System Survey Questionnaire.* Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 2006.
- Bliss RE, Garvey AJ, Ward KD. Resisting temptations to smoke: results using within-subject analyses. *Psychology of Addictive Behaviors.* 1999;13:143-151.
- DiClemente CC, Prochaska JO, Fairhurst S, Velicer WF, Rossi J, Velasquez M. The process of smoking cessation: an analysis of precontemplation, contemplation and contemplation/action. *J Consult Clin Psychol.* 1991;59:295-304.