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Favorite cigarette of the day in a random sample of women smokers

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Abstract

From a Random Digit Dialing survey of American women, we assessed current smokers ($n = 371$). Respondents were 33.6 ± 7.6 years old, 49.6% married, and 87.6% White, with an FTND score of 3.9 ± 2.6 . When asked “which cigarette of the day would be the most difficult for you to give up?” 30 women gave uncodable responses and 341 women provided answers subsequently coded into 5 categories: FIRST; 43.7%, MEAL; 29.3%, LAST; 13.8%, ROUTINE; 7.3%, and ENHANCE; 5.9%. Response groups differed significantly on age ($p < .01$), smoking rate ($p < .001$), time to first cigarette ($p < .001$), and self-rated health ($p < .05$). In Post Hoc analyses, FIRST were older, smoked more cigarettes/day, and smoked sooner after waking than at least one other group. LAST smoked the fewest cigarettes/day, and ENHANCE rated their health significantly better than did all other groups. The FTND is coded as 1 for “first” and 0 for any other response. Examining more closely the richness contained in that “other” category is a novel approach that may prove useful as a phenotyping tool.

Keywords

Women; Nicotine; Smoking; Cigarette; Random digit dialing survey

1. Introduction

Smoking has an enormous impact on the public health of our nation. Although the smoking rate has decreased over the past 40 years, from its peak in the 1960s when 40% of the U.S. population smoked, to today's rate of 21% (National Health Interview Surveys [NHIS], selected years – United States, 1965-2004), there is evidence to suggest that the decline has asymptoted (NHIS, 1997-2005). More targeted approaches may therefore be needed to assist individuals in quitting.

In the hopes that better phenotyping will eventually lead to better individualized smoking cessation programs, instruments have been developed to characterize smokers along various dimensions. The Fagerstrom Test of Nicotine Dependence (FTND; Heatherton, Kozlowski, Frecker & Fagerstrom, 1991), as its name suggests, is a frequently used, highly regarded measure of nicotine dependence. One of the items on this questionnaire, “Which cigarette of the day would you most hate to give up?” contributes importantly to the assessment of nicotine dependence by distinguishing preference for the first cigarette of the day (coded “1”) from all

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other answers (coded “0”). Dichotomizing the full range of responses to this open-ended question, however, results in the loss of a wealth of information that may be of potential use in the phenotyping of smokers. For example, weight-control smokers might be conjectured to favor the postprandial cigarette for its appetite-suppressing effects; similarly, depressed smokers might be most reluctant to relinquish cigarettes that enhance mood or activities.

In order to explore this possibility, we took advantage of a database generated by random-digit dialing in which responses were recorded verbatim to derive a classification system that could accommodate most responses. We then conducted analyses to determine what variables might predict group membership based on most preferred cigarette.

2. Methods

2.1. Participants

Using a scientifically selected probability sample representative of the household population of 18 to 45 year old women in the United States, a random digit dialing survey was completed by the University of Michigan's Survey Research Center. Women from age 18 to 45 were asked to participate if they were not currently pregnant and had not given birth within the previous six weeks. Only current smokers (defined as having smoked at least 4 days per week for at least a year and not currently using a nicotine patch, nicotine gum, nasal spray, or inhaler) were included in the present study, resulting in a sample size of 371 for this study. (For more details on the original study, see Pomerleau, Zucker, & Stewart, 2001.)

2.2. Procedure

Advance letters describing the purpose and the sponsor of the study were sent to households that had been randomly selected for contact. Trained interviewers then called these households to identify eligible and interested participants. Verbal informed consent was provided by all participants.

The Fagerstrom Test of Nicotine Dependence (FTND; Heatherton et al., 1991) was administered to all current smokers. In addition to the open-ended query of which cigarette would be hardest to relinquish, this instrument assesses cigarettes/day and time to the first cigarette of the day, variables regarded as critical indices of nicotine dependence (Heatherton, Kozlowski, Frecker, Rickert, & Robinson, 1989). The Center for Epidemiological Studies-Depression scale (CES-D; Radloff, 1977) was administered to assess depression. The Dieting and Bingeing Severity Scale (DBSS; Krahn, Kurth, Demitrack, & Drewnowski, 1992; Kurth, Krahn, Nairn, & Drewnowski, 1995) and the Weight-Control Smoking Scale (WCSS; Pomerleau, Ehrlich, Tate, Marks, Flessland, & Pomerleau, 1993) were used as measures of disordered eating and smoking-related weight concerns. Readiness to quit smoking (Stages; Prochaska & DiClemente, 1983) was also assessed. Self-rated health was measured on a scale of 1 (excellent) to 4 (poor).

Responses on the open-ended FTND item “Which cigarette of the day would you most hate to give up?” were coded as follows: FIRST (first cigarette of the day); LAST (last cigarette of the day); ROUTINE (cigarette smoked during daily routine [e.g. driving to work]); MEAL (cigarette with a meal); ENHANCE (cigarette smoked to enhance mood, substance, or event [e.g. relaxing, drinking coffee or alcohol, after sex]); and OTHER (nonspecific or uncodable responses [e.g. all, none]).

3. Results

Of the 9072 numbers called, 945 women were interviewed, of whom 371 were current smokers. Participants had a mean ($\pm$ standard deviation) age of 33.6 ± 7.6 years. Nearly half (49.6%) of

the respondents were married, and 87.6% were White. The mean score on the Fagerstrom Test of Nicotine Dependence (FTND) was 3.9 ± 2.6 .

The 8% of individuals coded as “OTHER” were excluded from the database, leaving a sample of 341 current smokers. Figure 1 shows the distribution of participants in the remaining 5 response categories.

The five groups were compared using Pearson Chi-Square for categorical measures, and ANOVAs, at which time a difference emerged for age ($p = .003$), such that smokers in the FIRST group were significantly older than those in groups ROUTINE and MEAL (Sheffe post hoc test; $p = .036$ and $p = .046$ respectively). All subsequent analyses used GLM/Univariate for continuous measures, with age as a covariate and simple contrasts to determine which groups differed from others.

Group differences were detected for number of cigarettes smoked per day ($p < .001$), the amount of time after waking before smoking the first cigarette ($p < .001$), and self-rated health ($p = .018$). Post Hoc analyses showed that respondents in the FIRST group were older, smoked more cigarettes per day, and smoked sooner after waking, compared with at least one of the other groups. Respondents in the LAST group smoked fewer cigarettes/day than all other groups, and respondents in the ENHANCE group rated their health as better than those in all other groups. Between-group differences are shown in Figure 2.

No significant between-groups differences were detected for race, household income, education, marital status, BMI, daily caffeine or alcohol consumption, depression (CES-D), disordered eating (DCAT), smoking-related weight-concerns (WCSS), age of smoking initiation, number of quit attempts, or readiness to quit smoking (Stages).

4. Discussion

We found that individuals who identify the “first cigarette of the day” as the cigarette they would most hate to relinquish also smoked more cigarettes per day and smoked sooner after waking, supporting use of this question as an index of nicotine dependence. By contrast, those who responded “last cigarette of the day” smoked significantly fewer cigarettes per day and waited a mean of nearly 3 hours before smoking their first daily cigarette. In general, respondents classified as LAST and ROUTINE showed less evidence of dependence. Respondents categorized as MEAL and ENHANCE tended to show intermediate values. Interestingly, ENHANCE rated their health higher than did any of the other groups.

Our hypotheses regarding alternative phenotypes based on depression and weight-related variables were not supported, since group differences on these instruments were not observed. Group differences on self-rated health, however, support the possibility that further exploration will expose group differences in domains other than nicotine dependence.

We believe our study was unusual in collecting detailed answers to the open-ended question on the FTND regarding which cigarette would be hardest to relinquish, and the only one, to our knowledge, that has attempted to find orderly patterns in these responses. We encourage other investigators to follow our lead in the hopes that examining more closely the richness contained in the varied responses to this item may prove a novel approach that may yet, prove useful as a phenotyping tool.

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Figure 1.
Distribution of responses for most difficult cigarette to give up (n = 341).

Figure 2.
Differences between groups (n = 341).