

A comparison of smoking cessation clinic participants with smokers in the general population

Paul G McGovern, Harry A Lando, Joachim Roski, Phyllis L Pirie, J Michael Sprafka

Abstract

Objective – To assess the representativeness of a smoking cessation clinic population when compared to a population-based sample of smokers from the same community.

Subjects – Smoking cessation clinic participants were 1267 smokers aged 25–84 years who attended a 13-session eight-week programme held at various locations throughout the Twin Cities metropolitan area in Minnesota, USA. The population-based sample of smokers consisted of 848 current smokers aged 25–84 years who completed the Minnesota Heart Survey home interview.

Results – When compared to the background smoking population, women were more likely than men to attend smoking cessation clinics ($p < 0.0001$). Sex-specific analyses revealed that clinic enrollees of both sexes were more likely to be better-educated, older, white, married, and heavier smokers ($p < 0.0001$ in all instances). After adjustment for all other independent variables, these relationships persisted ($p < 0.05$) although attenuated in many cases. Multivariate adjustment also revealed that male and female clinic attendees were more likely to be lighter in weight ($p < 0.05$).

Conclusions – Future work is needed in the design and delivery of formal smoking cessation programmes to target more aggressively underserved minority populations that often have very high prevalences of smoking.

(*Tobacco Control* 1994; 3: 329–333)

Introduction

Characteristics of self-quitters and smokers attending formal face-to-face cessation programmes have been previously compared.¹ These data, as well as data from formal treatment programmes, indicated that enrollees in smoking cessation programmes were heavier smokers, better educated, older, and more likely to be female. However, there is only one study comparing smokers seeking a smoking cessation programme to the wider population of smokers from which they come. This study,² which compared smokers en-

rolling in self-help programmes to the population of smokers from which they were drawn, found that the programme participants were more likely to be female, older, better educated, and heavier smokers with poorer levels of health status (eg, self-perceived health and energy) and less healthy lifestyles (eg, exercise). No similar comparison exists for attendees of intensive group-based smoking cessation clinics. Concern has been expressed that racial minorities, blue-collar workers, and those who are less educated are underrepresented in these types of programmes.^{3–5} This is especially unfortunate, because these groups tend to have high prevalences of smoking.

The present study assessed the representativeness of a very large smoking cessation clinic population against a random sample of smokers drawn from the general population. In both cases respondents were recruited from the seven-county metropolitan area of the Twin Cities of Minneapolis and St Paul, Minnesota, which had a total population of approximately 2.25 million in the 1990 census. It was hypothesised that the clinic participants would be older, would smoke more heavily, would be more highly educated, and would have less minority representation than would smokers identified as part of a general population survey.

Methods

CLINIC PARTICIPANTS

The clinic participants were 1291 smokers who were at least 18 years of age and who responded to advertisements of free group intervention for smoking cessation between September 1990 and April 1991. The advertisements were placed in the two daily newspapers serving the Twin Cities, the Minneapolis *Star Tribune* and the St Paul *Pioneer Press*, and the clinics were offered in 39 locations widely dispersed throughout the seven-county metropolitan area. Treatment consisted of a 13-session eight-week programme offered in groups of approximately 10 to 15 smokers.⁶ Smokers were required to submit a \$50 deposit (refundable upon return of 12-month follow-up questionnaire) to participate in the clinic. Return of the deposit was not contingent upon smoking status. Clinic participants completed a detailed self-administered baseline demographics and smoking history questionnaire at an initial

Division of
Epidemiology, School
of Public Health,
University of
Minnesota,
Minneapolis,
Minnesota, USA
PG McGovern
HA Lando
J Roski
PL Pirie
JM Sprafka

Correspondence to Paul G McGovern, Division of Epidemiology, University of Minnesota, 1300 South Second Street, Suite 300, Minneapolis, Minnesota 55454-1015, USA

Table 1 Characteristics of clinic enrollees and survey respondents by sex

	Men		Women	
	Clinic enrollees (n = 515)	Survey respondents (n = 400)	Clinic enrollees (n = 752)	Survey respondents (n = 448)
Education				
Less than high school (%)	0.8	11.0*	1.6	10.0*
High school graduate (%)	15.2	38.3	19.6	40.6
Vocational or technical school (%)	15.3	12.5	18.1	11.8
Some college (%)	31.5	19.8	25.8	22.1
College graduate (%)	37.3	18.5	35.0	15.4
White (%)	98.4	88.2*	98.9	91.3*
Married (%)	75.4	54.8*	55.4	44.1*
Age (years)				
25-34 (%)	18.5	38.3*	17.6	36.8*
35-44 (%)	37.9	30.3	30.7	28.8
45-54 (%)	26.4	18.0	31.5	18.3
55-64 (%)	14.4	8.5	14.5	9.2
65-84 (%)	2.9	5.0	5.7	6.9
Daily cigarette consumption†	29.5 (12.9)	20.5* (11.1)	25.4 (11.1)	16.0* (9.6)
Body mass index (kg/m ²)‡	26.13 (3.8)	26.36 NS (4.1)	24.3 (4.7)	25.6* (5.5)

* $p < 0.0001$; NS = not statistically significant, $p > 0.05$.

† Standard deviation in parentheses.

‡ Measured at clinic visit in case of survey respondents in 311 men (78%) and 344 women (77%).

orientation session including items on age, sex, race, height, weight, and educational attainment. To ensure comparability with the survey data, smokers under 25 and over 84 years of age ($n=17$) and smokers who did not report their age ($n=7$) were not included in data analysis.

POPULATION-BASED SURVEY OF SMOKERS

This sample consisted of all smokers participating in a population-based survey of Twin Cities residents aged 25–84 years which occurred between September 1990 and August 1991 as part of a cardiovascular disease risk factor survey for the Minnesota Heart Survey (MHS). The methods of MHS have been described previously.⁷ Briefly, the seven-county Twin Cities metropolitan area was divided into 704 clusters of approximately 1000 households each. Forty clusters were selected randomly and households in these clusters were selected for enumeration. After enumeration, one individual aged 25–74 years per household was randomly selected for interview.

Eligible individuals underwent a 30-minute home interview to determine sociodemographic characteristics, medical history, health attitudes and beliefs, current smoking status, and use of medications. Participants were invited to later report to local survey centres where a detailed smoking history was collected in addition to measurements of height, weight, blood pressure, and cholesterol. Considering the total MHS sample ($n=3260$), 83.5% completed the home interview. Of those interviewed, 848 were current smokers, and 645 of these smokers (76%) were also seen in the survey centres.

DATA ANALYSIS

Height and weight of clinic participants were ascertained via self-report as compared to clinic measurement in the population-based

survey. To improve comparability of derived measures of body mass index (BMI), the self-reported measurements were transformed based on population-based, sex-specific linear regression predictions of measured height and weight from self-reported measurements.⁸ The net effect of this transformation was to increase mean levels of BMI by 0.28 and 0.71 kg/m² in the clinic participant men and women, respectively.

We estimated the association between participation in smoking cessation clinics and the various predictors using odds ratios (ORs) and their associated 95% confidence intervals (CIs) using unconditional logistic regression methods. These associations were estimated both crudely and after adjustment for all other variables with the exception of BMI (which was only measured at the survey centre in the population-based sample). Analyses were done separately in men and women. Since the number of smokers who attended the smoking cessation clinics was well below 1% of the adult smoking population in the Twin Cities metropolitan area, the OR estimates can be considered as estimates of the relative likelihood of participation in smoking cessation clinics among smokers.

The independent variables – age, daily cigarette consumption, and BMI – were measured on a continuous scale. Preliminary logistic regression analysis (using linear and quadratic terms) revealed that only age had a curvilinear association with participation in the smoking cessation programme. Thus, age was modelled using six categories, representing five 10-year intervals and one 20-year interval (due to small numbers) from 65–84 years of age.

Results

Of the total 1267 smoking cessation participants aged 25–84 years, 59.4% were women; this compares with a female representation in the population-based survey of 52.8%. Thus, women were more likely to attend smoking

Table 2 Sex-specific relative odds in smoking population attending smoking cessation clinic

	Men		Women	
	Unadjusted OR & 95% CI	Adjusted† OR & 95% CI	Unadjusted OR & 95% CI	Adjusted† OR & 95% CI
Education				
Less than high school	1.0	1.0		
High school graduate	5.6 (1.9–16.2)	7.3 (2.2–24.0)	3.0 (1.5–5.9)	2.5 (1.1–5.8)
Vocational or technical school	17.4 (5.9–51.3)	24.6 (7.2–84.0)	9.6 (4.7–19.6)	11.9 (4.9–29.1)
Some college	22.6 (7.8–65.20)	31.3 (9.4–104.6)	7.3 (3.7–14.5)	9.8 (4.1–23.2)
College graduate	28.5 (9.9–82.2)	41.2 (12.3–137.6)	14.3 (7.2–28.5)	20.5 (8.5–49.0)
White (vs ethnic minority)	8.4 (3.9–18.1)	4.9 (2.0–12.2)	8.9 (4.1–19.2)	3.2 (1.2–8.6)
Married (vs unmarried)	2.3 (1.7–3.0)	2.0 (1.4–2.8)	1.6 (1.2–2.0)	1.9 (1.4–2.5)
Age (years)				
25–34	1.0	1.0	1.0	1.0
35–44	2.6 (1.8–3.7)	1.4 (0.9–2.1)	2.2 (1.6–3.1)	1.3 (0.9–1.9)
45–54	3.0 (2.1–4.5)	1.5 (0.9–2.3)	3.6 (2.6–5.1)	2.6 (1.7–3.9)
55–64	3.5 (2.2–5.7)	2.2 (1.2–3.9)	3.3 (2.2–5.1)	2.9 (1.7–4.9)
65–84	1.2 (0.6–2.5)	1.7 (0.7–4.1)	1.7 (1.0–2.9)	2.1 (1.1–4.1)
Daily cigarette consumption				
10.3 cigarettes per day‡	2.0 (1.8–2.4)	2.0 (1.8–2.4)	2.8 (2.4–3.3)	2.9 (2.4–3.5)
Body mass index 4.9 (kg/m²)‡	0.9 (0.8–1.1)	0.8 (0.6–1.0)	0.8 (0.7–0.9)	0.7 (0.6–0.9)

† Adjusted for all other terms in the table except body mass index.

‡ An increase of 1 standard deviation (pooled within-sex) in the survey respondents.

OR = odds ratio, CI = confidence interval.

cessation clinics than men (OR = 1.3; 95% CI = 1.1–1.6; $p < 0.0001$). In sex-specific analyses, there were large-scale unadjusted differences between clinic participants and the population-based survey of smokers on all of the measures examined ($p < 0.0001$; see table 1) with the single exception of BMI in men. Clinic enrollees of both sexes were better educated, smoked more, were older and more likely to be white and married than were survey centre participants. Ethnic differences were especially large with an estimated relative likelihood of a white smoker attending a smoking clinic compared to a minority smoker (African American, Hispanic, Asian-American, Native American, or other) of 8.4 in men and 8.9 in women (table 2). Of the 86 minority individuals in the survey sample, 51 were African Americans and 13 were Native Americans; whereas, of the 16 minority individuals who were clinic enrollees, 6 and 7 were African American and Native American, respectively. The sex-specific, unadjusted ORs and associated 95% CIs for all the independent variables are reported in table 2.

To adjust for correlations among the independent variables, multiple logistic regression techniques were employed. Each variable was adjusted for all other variables studied (except BMI). Data from 15 men (1.6%) and 36 women (3.3%) were not included in these analyses because of missing values on one or more of the independent variables. Sex-specific, adjusted odds ratios of participation in the smoking cessation clinics for each of the independent variables are shown in table 2. All independent variables remained highly significant ($p \leq 0.0007$) with the exception of age group ($p = 0.10$) and BMI ($p = 0.04$) in men, and race ($p = 0.02$) in women. When compared to the crude associations, the effects of education level, daily cigarette consumption, and BMI were stronger after adjustment whereas the opposite applied to race and age effects.

A simultaneous logistic regression model including sex estimated that, after adjustment, women smokers were twice as likely to attend

smoking cessation clinics than their male counterparts (OR = 2.0; 95% CI = 1.6–2.5). The only effect modification of an independent variable by sex occurred in the case of daily cigarette consumption with each additional cigarette smoked per day increasing the likelihood of attending a smoking cessation clinic more for women than men ($p = 0.003$).

Discussion

This is the first direct comparison of smoking cessation clinic attendees with the general smoking population from which they were drawn. It confirms many of our expectations. When compared to the general adult smoking population, clinic attendees were more likely to be heavy smokers, female, older, white, and better educated. They were also more likely to be married and to have a lower BMI. A somewhat similar study comparing enrollees in self-help programmes with their background smoking population in a health maintenance organisation located in the Pacific northwest² had similar findings except for race and marital status; BMI was not studied. The failure to find an association with race was probably due, in part, to low statistical power. The study also reported that participants were more likely to have made a quit attempt in the past two years and to have had a conviction that quitting would improve how they feel. A recent report⁹ compared 3758 respondents to mass-media advertisements for a self-help smoking cessation programme in the San Francisco area with a very large population-based sample. In agreement with our findings, the volunteers were more likely to be female, older, better educated, and heavier, more dependent smokers. In contrast, however, they were less likely to be married, and ethnic differences between the volunteer and population-based samples appeared to be small. We are not aware of a direct comparison between enrollees in minimal-contact, self-help programmes and intensive, clinic-based programmes.

A striking finding from our data was the severe underrepresentation of minority smo-

kers in the smoking cessation clinics. Although less minority representation was predicted in clinics relative to the survey population, the magnitude of the difference was unexpected. The minority proportion of the 1990 population of the Twin Cities metropolitan area was 8.4%, of whom 47% were African American, 34% Asian American, and 12% Native American. However, of the population-based sample of home-interviewed smokers, African Americans and Native Americans constituted 59% and 15%, respectively, of the minority members. This conforms with national data¹⁰ that African Americans and urban Native Americans tend to have high smoking prevalences. Furthermore, they are quitting at a significantly lower rate than are smokers in the US as a whole.^{5,11-14} Achieving better representation of minority and lower socioeconomic status (SES) populations in smoking cessation programmes should be a major priority. The effective availability of such programmes to minority and lower SES populations has been extremely limited. Recent reports have revealed high levels of recent quit attempts and interest in quitting in African American⁴⁻⁵ and Native American¹¹ respondents.

Educational differences in propensity to attend intensive smoking cessation clinics, although anticipated, were impressive in magnitude. For instance, in adjusted analyses, college graduate smokers were approximately 40 and 20 times more likely (for men and women, respectively) to attend smoking cessation clinics than were smokers with less than a high school education.

The observation in these data that married smokers were about twice as likely to attend intensive smoking cessation clinics is somewhat surprising. Although married couples often come together to smoking cessation programmes, this alone cannot explain an association of this magnitude. Perhaps there is increasing concern among married smokers about the deleterious effects of passive smoking on family members.¹⁵

Another surprising finding was that lower BMI was associated with a greater likelihood of attending smoking cessation clinics. This association was slightly stronger in women but was statistically significant in both sexes after adjustment for the other independent variables. Weight gain after smoking cessation is well documented¹⁶ and is a major concern of smokers contemplating quitting.^{17,18} Furthermore, it may be a contributing factor to recidivism. Thus, it is very possible that smokers with a lower BMI are more likely to attend smoking cessation programmes because they are less concerned about possible weight gain after quitting. However, in direct contradiction, Glasgow *et al.*¹⁹ found that worksite participants in a smoking cessation programme were heavier than nonparticipants. This issue deserves further study.

Clearly, clinic enrollees are a highly self-selected population. They represent the relatively small fraction of smokers who seek assistance in quitting as opposed to quitting on their own.¹ Based on unpublished 1990-92

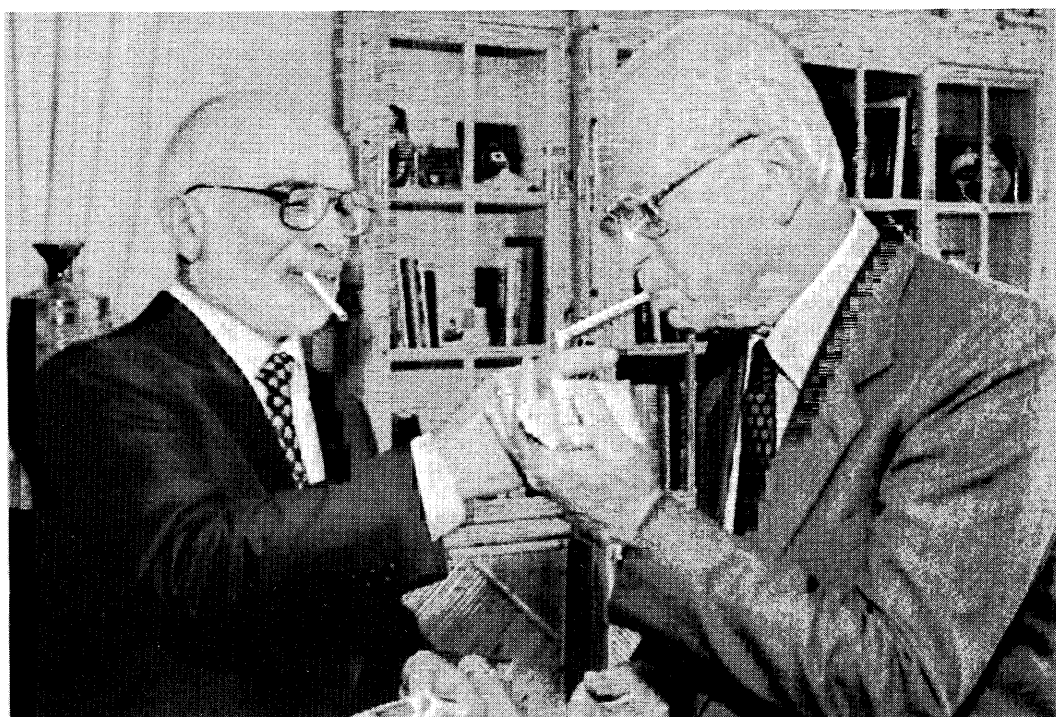
MHS risk factor survey results and 1990 US census data, we estimate that there were approximately 370 000 smokers aged 25-84 years in the Twin Cities metropolitan area in 1990. This suggests that the extensive newspaper publicity for the smoking cessation programme attracted 0.34% of all smokers, ie, approximately 1 in every 300. Despite this low enrollment, intensive clinic programmes represent an important option for more heavily dependent smokers who may not respond to self-help or minimal intervention approaches.²⁰

Recruitment to the clinics was restricted to advertising in the two major Twin Cities daily newspapers although the programme was offered throughout the Twin Cities area, including inner city neighbourhoods. Lower educated and lower SES groups (including disproportionate numbers of ethnic minorities) are less exposed to the print media.^{21,22} Furthermore, daily newspapers court generally higher SES readers who attract advertisers.²³ The advertisements clearly indicated that the clinics were part of a university research project, and this also may have been viewed negatively by some. Future promotional efforts should more aggressively target specialised weekly newspapers and other media that serve ethnic minorities and lower SES smokers. However, this in itself is unlikely to be sufficient. While clinic facilitators should include minority representation, and clinic content should reflect issues important to the target population, additionally, perhaps, clinics should be specifically targeted at minority communities, eg, through African American churches.

The research clinics were supported by Grant R01 HL44992 from the National Heart, Lung, and Blood Institute. The Minnesota Heart Survey was supported by Grant R01 HL23727 from the National Heart, Lung, and Blood Institute.

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Peace and puffs in the Middle East. Israeli Prime Minister Yitzhak Rabin (right) and King Hussein of Jordan share a smoke after signing a peace treaty this past October.