



Smoking Social Norms Among Young Adults in New York City

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Abstract

More than half of young adult (YA) (ages 18–26) smokers are non-daily smokers. While standard cessation methods are generally successful with adults and daily smokers, there is evidence that they are not as successful among non-daily smokers or young adults. Additionally, YA smokers are also in a transition period to regular smoking, making research on understanding how interpersonal and environmental factors affect this group of smokers critical. Randomized time location sampling was used to create a sample of New York City YA bar patrons between June and November 2013, who completed a self-administered survey (1,916 surveys). Questions were asked about perceived smoking social norms, stigma, behaviors, and demographics. Overall, almost half of the YA reported being current smokers (44.1%); one-third were non-daily smokers (36.7%) and less than ten percent were daily smokers (7.4%). Non-daily smokers compared with daily smokers had greater odds of believing New Yorkers disapproved of smoking [adjusted odds ratio (OR_{adj}) 1.76, 95 % CI 1.10–2.79], keeping tobacco a secret from certain people (OR_{adj} 1.84, 1.14–2.96) and feeling guilty when smoking (OR_{adj}: 2.54; 1.45–4.45). Non-daily smokers had 41% lower odds of reporting how people who are important to you disapproved of smoking than daily smokers (OR_{adj}: 0.59; 0.38–0.94). Further studies of interpersonal/environmental factors among YA smokers may support modifications to cessation programs that result in more successful YA quit attempts.

Keywords Smoking · Young adults · Social norms · New York City

Introduction

Smoking, a leading cause of preventable death, is responsible for more than 480,000 US deaths annually [1]. Smokers have increased risk of serious health problems and early death [1]. Most smoking initiation begins during youth (< age 18) and progresses to regular use during young adulthood (YA) (ages 18–26) [2–4]. YAs undergo dramatic changes in living arrangements, social interactions, and work/school settings; these burdens increase their vulnerability to smoking [5]. In 2014, current cigarette smoking was higher among those aged 18 to 25 (28.4%) compared

with adolescents aged 12 to 17 (4.9%) and those aged 26 or older (21.5%) [6].

Among YA smokers, non-daily and daily smoking are important considerations [7]. One-third of US smokers are non-daily, including 54.9% of YA smokers [8]. Compared to daily, non-daily smokers are younger, female, more educated, have higher incomes and are more likely to be Black and Hispanic [9–11]. Non-daily smoking may lead to established smoking habits among YA. Delnevo found 5% of YA progressed from non-daily to daily smoking in the last year, and 8% initiated non-daily smoking [12].

Perhaps, due to their high rates of non-daily smoking, determining effective YA cessation interventions is challenging. YA may be less receptive to standard interventions, including medication and/or counseling [13, 14]. This may be due to intervention participants being daily smokers and smoking > 10 cigarettes per/day, while evidence for efficacy among YA is less robust [13]. Psychosocial intervention methods addressing social norms or stigma may complement clinical cessation efforts in a more relevant and accessible way for YA smokers [13].

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“Social norms” refers to subjective norms, defined by Cialdini as: (1) descriptive norms—the popularity of a certain act; and (2) injunctive norms—social approval of the act [15]. These norms are constructed from: observable behavior, direct/indirect communication and attitudes/stigma [16, 17]. Social norms theory examines environmental and interpersonal influences necessary to change behavior, possibly more effective than focusing on individual behavior change [18]. Interpersonal and environmental factors including peer smoking, smoke-free policies at work, non-smoking residences and college attendance have impacted YA smoking behaviors [19–21]. Additionally, tobacco control social norms research is limited to mostly adolescents [22–25].

Many health-related behaviors are established in early adulthood. Teenage experimentation progresses to regular smoking during early adulthood [2, 3], and is predicted by underlying social and psychological factors including parent smoking, smoking attitudes and norms, family environment, and attachment to family and friends [26, 27]. Yet social and psychological factor research affecting YA smokers is limited [28]. More social norm studies will help identify social environments and attitudes that encourage unhealthy behaviors and aspects that promote healthier alternatives, to target programs and policies. Changing social attitudes and environments can support prevalence reductions of unhealthy behaviors including tobacco use [29].

Stigma may also influence YA smokers. Stigma is, “a mark of disgrace associated with a particular circumstance” [30]. Smoke-free policies have supported decreasing smoking rates, but they may have increased perceived smoking stigma; smokers may feel marginalized when required to smoke outside [31]. Stigma can deter smoking, but also incite guilt and result in smokers hiding their habit from medical professionals, family members and friends [31].

Our study describes and examines predictors of YA smoking behaviors, social norms and attitudes regarding smoking stigma. We hypothesized YA non-daily smokers were more likely to be associated with traditional social norm attitude/stigma on smoking than YA daily smokers because non-daily smokers are less likely to consider themselves smokers, to witness smoking and/or be exposed to smoking compared with daily smokers.

Methods

Sample Design and Data Collection

Cross-sectional data were collected (1916 surveys) from a sample of New York City (NYC) YA bar patrons ages 18–26 from June–November 2013 using randomized time location sampling. Time location sampling recruits random samples of difficult to reach or hidden populations [32]. Sampling

involved developing a list of venues commonly visited by YA; specific recruitment dates and times were randomly selected from this list [33–36]. Interviews were conducted with patrons and owners of popular bars and nightclubs to compile the list. Several studies have used similar methods [32, 33, 37]. Venues and times were randomly selected, stratified by location to ensure representation. Managers provided authorization to collect data and entry fees were paid.

Study personnel visited 63 venues during 109 randomly selected data collection periods, counted the number of people present, and approached all individuals appearing to be ages 18–29. Participants whose self-reported age was 18–29 were invited to complete self-administered surveys (79% response rate). Study personnel explained the study and collected verbal consent from each participant. Consenting participants responded to questionnaires in the bar; taking about 15 min. All participants were given an information sheet with website link, business card, and \$5 incentive. Self-reported age was verified by cross-checking self-reported birth date. Analysis was restricted to respondents ages 18–26. Participants were excluded if they were unwilling or unable to consent. Non-NYC residents were excluded from analyses. The study was reviewed and approved by the institutional review board (IRB) at the University of California San Francisco and the NYC Department of Health and Mental Hygiene IRB determined this analysis is exempt.

Perceived Social Norms and Stigma

We selected survey questions from existing literature [38, 39]. For descriptive smoking norms, participants estimated the percentage of people their age who smoked cigarettes using 10-point percentage increments from 0 to 100. Four items were included to examine injunctive smoking social norms. The perceived attitude social norms were: (1) How do most New Yorkers feel about cigarette smoking? (SN1) and (2) How do people who are important to you, like family and friends, feel about cigarette smoking? (SN2) These questions used a 5-point scale ranging from 1 (strongly disapprove) to 5 (strongly approve). Responses were collapsed into disapprove vs. approve/neither.

The personal smoking stigma questions were: (3) I keep my tobacco smoking a secret from certain people (ST1), and (4) I feel guilty when I smoke (ST2). These were answered on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree), and recoded into agree vs. disagree/neutral.

Smoking Behaviors and Smoke Exposure

Smoking behavior was assessed by “During the past 30 days, on how many days did you smoke at least one cigarette?” Smoking on all 30 days were coded as daily smokers. Smoking between 1 and 29 days was coded as non-daily smoking.

Smoking 0 days was categorized as non-smoking. Self-identified smokers were determined by, “Do you consider yourself to be a smoker?” Exposure to secondhand smoke was assessed by, “In the last 7 days, have you been exposed to someone else’s tobacco smoke in any of the following places: workplace; street; public park/ beach; own home; bar/club; and/or patio?” The survey asked, “Which statement best describes the rules about cigarette smoking inside your home?” This was answered on a 5-point scale ranging from 1 (smoking is not allowed anywhere inside my home) to 5 (there are no rules about smoking inside my home). Responses were recoded into not allowed vs. allowed. Exposure to secondhand smoke at home was determined by, “Do you live with someone who smokes cigarettes?”

Alcohol Use Behaviors

The literature showed alcohol consumption was associated with feeling guilt/stigma when smoking cigarettes [37, 40]. Binge drinking was defined as, “During the past 30 days did you drink at least 5 alcoholic shots or drinks within a few hours?” and was included in our ST2 model, “I feel guilty when I smoke”.

Demographics

Demographic included: gender (male/female), age (18–24 years, 25–26 years), race/ethnicity (non-Hispanic White, non-Hispanic Black, non-Hispanic Asian/Pacific Islander, Hispanic), nativity (US born-yes/no), employment (yes/no), NYC borough of residence (Manhattan, Brooklyn, Queens, Bronx, Staten Island), years lived in NYC (< 1 year, 1–5 years, 6–10 years, > 10 years), and educational attainment (< high school, high school, some college, college student, college graduate). We created a dichotomous education variable (currently in college/college grad and less than college).

Statistical Analysis

All analyses were conducted in 2016 using SAS Version 9.4. Bivariate analyses examined demographics among each smoking social norm/stigma category using a Pearson Chi square test to assess significance. Confidence Intervals (95% CI) were used when comparing differences in social norm/stigmas and overall demographics. Bivariate analyses included only participants who answered “disapprove” for SN1 and SN2 and “agree” for ST1 and ST2. Multivariable models were performed for four outcomes: Model 1, SN1, disapprove vs. approve/ neither; Model 2, SN2, disapprove vs. approve/ neither; Model 3, ST1, agree vs. disagree/ neutral; and Model 4, ST2, agree vs. disagree/ neutral. Adjusted odds ratios (ORs) and 95% CI were reported. Participants who did not live in NYC were excluded from all analyses.

Results

Almost half of YAs reported being current smokers (44.1%). Participants were typically female, 25–26 years old, non-Hispanic white or Hispanic, US born, employed, Manhattan resident, NYC resident more than 10 years, and currently in college/college grad (Table 1). While non-smokers were similar to the overall sample, non-daily and daily smokers demonstrated differences. More non-daily smokers (38.3%) reported living in NYC 1–5 years compared with non- or daily-smokers. Daily-smokers (52.4%) were more likely to be male, compared with non-smokers and more than one-third lived in Queens (39.5%) compared with non-daily smokers (18.0%) (Table 1). Overall, one-third of respondents reported being non-daily smokers (36.7%) and few were daily smokers (7.4%). Most participants were exposed to secondhand smoke (78.1%), prohibited smoking inside their home (54.7%) and did not live with a smoker (68.6%) (Table 3).

Perceived General Social Disapproval of Smoking

Participants who perceived that New Yorkers disapproved of smoking (SN1) were similar demographically to participants overall, with some smoking-related behavioral differences. Those who reported New Yorkers disapproved of smoking were more likely to have lived in NYC 1–5 years (SN1: 39.9%, 95% CI 36.1–43.7) (Table 2) compared to overall (30.7%, 95% CI 28.5–32.8). This group was less exposed to secondhand smoke (35.6%, 95% CI 33.0–38.2) compared to overall (78.1%, 95% CI 76.2–80.0) but did allow smoking inside the home (59.0%, 95% CI 55.8–62.3) more frequently than overall (45.3%, 95% CI 43.0–47.7) (Table 3).

Non-daily smokers were more likely to report that New Yorkers disapprove of cigarette smoking (SN1: OR = 1.76, 95% CI 1.10–2.79) compared with daily smokers (Table 4). Non-Hispanic blacks were also more likely to report that New Yorkers disapproved of smoking (OR = 1.69, 95% CI 1.03–2.76) compared to whites. New Yorkers’ disapproval was more likely to be reported by those with more education (OR = 2.25, 95% CI 1.47–3.45) and those who considered themselves smokers (OR = 1.74, 95% CI 1.18–2.57).

Perceived Disapproval Among Family and Friends

The demographics and smoking-related behaviors between those who reported friends and family disapproved of smoking (SN2) and the overall sample were similar.

Non-daily smokers had 41% (OR 0.59, 95% CI 0.38–0.94) lower odds of reporting that people who are important to them disapprove of cigarette smoking

Table 1 Responses to smoking status by demographics, young adults, NYC

| | Total (N=1,762) | | | Non-Smoker (n=930) | | | Non-daily smoker (n=611) | | | Daily Smoker (n=124) | | | | | |
|-----------------------|-----------------|------|--------------|--------------------|------|--------------|--------------------------|-----|------|----------------------|--------------------|-----|------|--------------|--------------------|
| | N | % | (95% CI) | n | % | (95% CI) | Chi-Square P-Value | n | % | (95% CI) | Chi-Square P-Value | n | % | (95% CI) | Chi-Square P-Value |
| Gender | | | | | | | | | | | | | | | |
| Female | 999 | 56.9 | (54.6, 59.2) | 571 | 61.5 | (58.4, 64.7) | 0.227 | 315 | 51.8 | (47.8, 55.8) | 0.955 | 59 | 47.6 | (38.8, 56.4) | 0.020* |
| Male | 757 | 43.1 | (40.8, 45.4) | 357 | 38.5 | (35.3, 41.6) | | 293 | 48.2 | (44.2, 52.2) | | 65 | 52.4 | (43.6, 61.2) | |
| Age | | | | | | | | | | | | | | | |
| 18–24 | 797 | 45.3 | (43.0, 47.6) | 434 | 46.7 | (43.5, 49.9) | 0.073 | 275 | 45.2 | (41.3, 49.2) | 0.026* | 44 | 35.5 | (27.1, 43.9) | 0.666 |
| 25–26 | 962 | 54.7 | (52.5, 57.0) | 496 | 53.3 | (50.1, 56.5) | | 333 | 54.8 | (50.8, 58.7) | | 80 | 64.5 | (56.1, 72.9) | |
| Race/ethnicity | | | | | | | | | | | | | | | |
| Non-Hispanic White | 599 | 35.0 | (32.7, 37.3) | 298 | 33.0 | (29.9, 36.1) | 0.002* | 209 | 35.3 | (31.5, 39.2) | 0.109 | 66 | 54.1 | (45.2, 63.0) | 0.009* |
| Hispanic | 554 | 32.4 | (30.2, 34.6) | 294 | 32.6 | (29.5, 35.6) | | 201 | 34.0 | (30.1, 37.8) | | 30 | 24.6 | (16.9, 32.2) | |
| Non-Hispanic Black | 294 | 17.2 | (15.4, 19.0) | 173 | 19.2 | (16.6, 21.7) | | 91 | 15.4 | (12.5, 18.3) | | 12 | 9.8 | (4.5, 15.1) | |
| Asian/PI | 264 | 15.4 | (13.7, 17.1) | 138 | 15.3 | (12.9, 17.6) | | 91 | 15.4 | (12.5, 18.3) | | 14 | 11.5 | (5.8, 17.1) | |
| US born | | | | | | | | | | | | | | | |
| Yes | 1589 | 91.0 | (89.7, 92.4) | 831 | 90.2 | (88.3, 92.1) | 0.003* | 570 | 93.9 | (92.0, 95.8) | 0.005* | 105 | 86.8 | (80.7, 92.8) | 0.365 |
| No | 157 | 9.0 | (7.6, 10.3) | 90 | 9.8 | (7.9, 11.7) | | 37 | 6.1 | (4.2, 8.0) | | 16 | 13.2 | (7.2, 19.3) | |
| Employed | | | | | | | | | | | | | | | |
| Yes | 1422 | 82.0 | (80.2, 83.8) | 750 | 81.6 | (79.1, 84.1) | 0.852 | 490 | 81.4 | (78.3, 84.5) | 0.937 | 100 | 83.3 | (76.7, 90.0) | 0.815 |
| No | 312 | 18.0 | (16.2, 19.8) | 169 | 18.4 | (15.9, 20.9) | | 112 | 18.6 | (15.5, 21.7) | | 20 | 16.7 | (10.0, 23.3) | |
| Borough | | | | | | | | | | | | | | | |
| Manhattan | 743 | 42.2 | (39.9, 44.5) | 383 | 41.2 | (38.0, 44.3) | <0.001* | 315 | 51.6 | (47.6, 55.5) | <0.001* | 23 | 18.5 | (11.7, 25.4) | <0.001* |
| Brooklyn | 219 | 12.4 | (10.9, 14.0) | 113 | 12.2 | (10.0, 14.3) | | 71 | 11.6 | (9.1, 14.2) | | 24 | 19.4 | (12.4, 26.3) | |
| Queens | 435 | 24.7 | (22.7, 26.7) | 253 | 27.2 | (24.3, 30.1) | | 110 | 18.0 | (15.0, 21.1) | | 49 | 39.5 | (30.9, 48.1) | |
| Bronx | 183 | 10.4 | (9.0, 11.8) | 89 | 9.6 | (7.7, 11.5) | | 72 | 11.8 | (9.2, 14.3) | | 8 | 6.5 | (2.1, 10.8) | |
| Staten Island | 183 | 10.3 | (8.9, 11.8) | 92 | 9.9 | (8.0, 11.8) | | 43 | 7.0 | (5.0, 9.1) | | 20 | 16.1 | (9.6, 22.6) | |
| Years in NYC | | | | | | | | | | | | | | | |
| Less than 1 year | 157 | 8.9 | (7.6, 10.2) | 80 | 8.6 | (6.8, 10.4) | <0.001* | 53 | 8.7 | (6.4, 10.9) | <0.001* | 17 | 13.7 | (7.6, 19.8) | 0.185 |
| 1–5 years | 540 | 30.7 | (28.5, 32.8) | 262 | 28.2 | (25.3, 31.1) | | 234 | 38.3 | (34.4, 42.2) | | 23 | 18.5 | (11.7, 25.4) | |
| 6–10 years | 313 | 17.8 | (16.0, 19.6) | 178 | 19.2 | (16.6, 21.7) | | 105 | 17.2 | (14.2, 20.2) | | 13 | 10.5 | (5.1, 15.9) | |
| More than 10 years | 751 | 42.6 | (40.3, 45.0) | 409 | 44.0 | (40.8, 47.2) | | 219 | 35.8 | (32.0, 39.6) | | 71 | 57.3 | (48.5, 66.0) | |

Table 1 (continued)

| | Total (N=1,762) | | | Non-Smoker (n = 930) | | | Non-daily smoker (n = 611) | | | Daily Smoker (n = 124) | | |
|-----------------------------------|-----------------|-------------------|--------------------|----------------------|-------------------|--------------------|----------------------------|-------------------|--------------------|------------------------|-------------------|--------------------|
| | N | % (95% CI) | Chi-Square P-Value | n | % (95% CI) | Chi-Square P-Value | n | % (95% CI) | Chi-Square P-Value | n | % (95% CI) | Chi-Square P-Value |
| Education | | | | | | | | | | | | |
| Currently in College/College Grad | 1432 | 81.6 (79.8, 83.5) | <0.001* | 785 | 84.9 (82.6, 87.2) | 0.002* | 493 | 81.1 (78.0, 84.2) | 0.058 | 84 | 67.7 (59.5, 76.0) | 0.004* |
| Less than college ¹ | 322 | 18.4 (16.5, 20.2) | | 140 | 15.1 (12.8, 17.4) | | 115 | 18.9 (15.8, 22.0) | | 40 | 32.3 (24.0, 40.5) | |

P values was generated by Pearson Chi-Square

Missing values were not included in the table

*Statistically significant (P value < 0.05)

¹Less than college were those who answered left college and/or graduated high school/GED

(SN2) than daily smokers. Hispanic (OR = 0.55, 95% CI 0.37–0.81) participants and those who lived with a smoker (OR = 0.38, 95% CI 0.24–0.48) were less likely to report friend/family disapproval of smoking than whites and non-smokers. YA currently in college/college graduates reported family/friends disapproval of smoking more frequently compared to those with less than a college education (OR = 1.96, 95% CI 1.31–2.93).

Smoking Stigma

Demographics varied between participants who felt either smoking stigma and overall. Those who felt smoking stigma (ST1 and ST2) were more likely to have lived in NYC 1–5 years (ST1: 44.1%, 95% CI 38.5–49.7; ST2: 44.6%, 95% CI 38.6–50.7), compared with overall (30.7%, 95% CI 28.5–32.8) (Table 2). Compared with overall, participants who felt smoking stigma were predominately non-daily smokers (ST1: 80.6%, 95% CI:76.0–85.1; ST2: 79.4%, 95% CI 74.4–84.4 vs. overall: 36.7%, 95% CI 34.4–39.0), (Table 3), were less likely to be exposed to secondhand smoke (ST1: 63.4%, 95% CI 60.0–66.8; ST2: 69.0%, 95% CI 65.7–72.2 vs. overall: 78.1%, 95% CI 76.2–80.0), while being more likely to allow smoking inside their home (ST1: 62.2%, 95% CI 57.2–67.2; ST2: 69.8%, 95% CI 65.1–74.6 vs. overall: 45.3%, 95% CI 43.0–47.7).

Non-daily smokers had higher odds (OR = 1.84, 95% CI 1.14–2.96) of agreeing they keep tobacco smoking a secret from certain people than daily smokers (ST1) (Table 4). The odds of agreeing to keep tobacco smoking a secret from certain people were more than twice as high (OR = 2.43, 95% CI 1.57–3.76) among those currently in college/college grad compared to those with less than a college degree. YA exposed to secondhand smoking had lower odds (OR 0.35, 95% CI 0.12–0.96) of keeping tobacco smoking a secret from certain people than those who did not keep smoking a secret.

Non-daily smokers had more than double the odds of agreeing they felt guilty when they smoked (ST2) compared with daily smokers (OR 2.54, 95% CI 1.45–4.45) (Table 4). Current college students/college grads had more than twice the odds of agreeing they felt guilty when they smoked compared to those with less than a college degree (OR 2.82, 95% CI 1.73–4.60). The odds of agreeing they felt guilty was higher (OR = 1.81, 95% CI 1.24–2.63) among those who lived with a smoker compared with those who did not. The odds of agreeing they felt guilty when they smoked was higher (OR = 1.75, 95% CI 1.10–2.78) among current binge drinkers.

Table 2 Responses to social norms by demographics, young adults, NYC

| | (SN1) How do most New Yorkers feel about cigarette smoking (n = 650) | | | (SN2) How do people who are important to you, like family and friends feel about cigarette smoking (n = 999) | | | (ST1) I keep tobacco smoking a secret from certain people (n = 306) | | | (ST2) I feel guilty when I smoke (n = 260) | | | | | | | | | |
|-----------------------|--|------|--------------|--|---------|------|---|----------|------------|--|--------------|-----|----------|--------------|---------|-----|------|--------------|--------|
| | N | % | (95% CI) | Chi-Square | P-Value | n | % | (95% CI) | Chi-Square | P-Value | n | % | (95% CI) | Chi-Square | P-Value | | | | |
| | Disapprove (SN1) | | | Disapprove (SN2) | | | Agree (ST1) | | | Agree (ST2) | | | | | | | | | |
| Gender | | | | | | | | | | | | | | | | | | | |
| Female | 999 | 56.9 | (54.6, 59.2) | <0.001* | 339 | 52.3 | (48.5, 56.2) | 0.002* | 587 | 58.9 | (55.9, 62.0) | 152 | 49.7 | (44.1, 55.3) | 0.336 | 129 | 49.6 | (43.5, 55.7) | 0.356 |
| Male | 757 | 43.1 | (40.8, 45.4) | | 309 | 47.7 | (43.8, 51.5) | | 409 | 41.1 | (38.0, 44.1) | 154 | 50.3 | (44.7, 55.9) | | 131 | 50.4 | (44.3, 56.5) | |
| Age | | | | | | | | | | | | | | | | | | | |
| 18–24 | 797 | 45.3 | (43.0, 47.6) | <0.001* | 293 | 45.1 | (41.3, 49.0) | 0.816 | 452 | 45.4 | (42.3, 48.5) | 139 | 45.7 | (40.1, 51.3) | 0.332 | 112 | 43.2 | (37.2, 49.3) | 0.933 |
| 25–26 | 962 | 54.7 | (52.5, 57.0) | | 356 | 54.9 | (51.0, 58.7) | | 544 | 54.6 | (51.5, 57.7) | 165 | 54.3 | (48.7, 59.9) | | 147 | 56.8 | (50.7, 62.8) | |
| Race/ethnicity | | | | | | | | | | | | | | | | | | | |
| Non-Hispanic White | 599 | 35.0 | (32.7, 37.3) | <0.001* | 238 | 37.7 | (33.9, 41.5) | 0.099 | 361 | 37.3 | (34.2, 40.3) | 115 | 38.7 | (33.2, 44.3) | 0.118 | 100 | 39.4 | (33.3, 45.4) | 0.046* |
| Hispanic | 554 | 32.4 | (30.2, 34.6) | | 186 | 29.5 | (25.9, 33.0) | | 296 | 30.5 | (27.6, 33.5) | 81 | 27.3 | (22.2, 32.3) | | 80 | 31.5 | (25.8, 37.2) | |
| Non-hispanic black | 294 | 17.2 | (15.4, 19.0) | | 115 | 18.2 | (15.2, 21.2) | | 162 | 16.7 | (14.4, 19.1) | 55 | 18.5 | (14.1, 22.9) | | 45 | 17.7 | (13.0, 22.4) | |
| Asian/PI | 264 | 15.4 | (13.7, 17.1) | | 92 | 14.6 | (11.8, 17.3) | | 150 | 15.5 | (13.2, 17.8) | 46 | 15.5 | (11.4, 19.6) | | 29 | 11.4 | (7.5, 15.3) | |
| US Born | | | | | | | | | | | | | | | | | | | |
| Yes | 1589 | 91.0 | (89.7, 92.4) | <0.001* | 596 | 93.1 | (91.2, 95.1) | 0.015* | 885 | 89.6 | (87.7, 91.5) | 280 | 92.4 | (89.4, 95.4) | 0.023* | 240 | 93.4 | (90.3, 96.4) | 0.110 |
| No | 157 | 9.0 | (7.6, 10.3) | | 44 | 6.9 | (4.9, 8.8) | | 103 | 10.4 | (8.5, 12.3) | 23 | 7.6 | (4.6, 10.6) | | 17 | 6.6 | (3.6, 9.7) | |
| Employed | | | | | | | | | | | | | | | | | | | |
| Yes | 1422 | 82.0 | (80.2, 83.8) | <0.001* | 525 | 81.8 | (78.8, 84.8) | 0.746 | 824 | 83.4 | (81.1, 85.7) | 245 | 80.9 | (76.4, 85.3) | 0.110 | 218 | 85.5 | (81.2, 89.8) | 0.083 |
| No | 312 | 18.0 | (16.2, 19.8) | | 117 | 18.2 | (15.2, 21.2) | | 164 | 16.6 | (14.3, 18.9) | 58 | 19.1 | (14.7, 23.6) | | 37 | 14.5 | (10.2, 18.8) | |

Table 3 Responses to social norms by smoking and involuntary smoke exposure status, young adults, NYC

| Total (N = 1,762) | | (SN1) How do most New Yorkers feel about cigarette smoking (n = 650) | | | (SN2) How do people who are important to you, like family and friends feel about cigarette smoking (n = 999) | | | (ST1) I keep tobacco smoking a secret from certain people (n = 306) | | | (ST2) I feel guilty when I smoke (n = 260) | | | | | | | | | |
|---|------|--|--------------------|---------|--|----------|--------------------|---|-----|----------|--|---------|-----|----------|--------------------|---------|-----|------|--------------|--------|
| N | % | (95% CI) | Chi-Square P-Value | n | % | (95% CI) | Chi-Square P-Value | n | % | (95% CI) | Chi-Square P-Value | n | % | (95% CI) | Chi-Square P-Value | | | | | |
| | | Disapprove(SN1) | | | Disapprove(SN2) | | | Agree(SN3) | | | Agree(SN4) | | | | | | | | | |
| Smoking habit¹ | | | | | | | | | | | | | | | | | | | | |
| Non-smoker | 930 | 55.9 | (53.5, 58.2) | <0.001* | 348 | 55.5 | (51.6, 59.4) | 0.049* | 581 | 61.1 | (58.0, 64.2) | <0.001* | 26 | 8.9 | (5.6, 12.1) | <0.001* | 30 | 11.9 | (7.9, 15.9) | 0.001* |
| Non-daily smoker | 611 | 36.7 | (34.4, 39.0) | | 244 | 38.9 | (35.1, 42.7) | | 301 | 31.7 | (28.7, 34.6) | | 236 | 80.6 | (76.0, 85.1) | | 200 | 79.4 | (74.4, 84.4) | |
| Daily smoker | 124 | 7.4 | (6.2, 8.7) | | 35 | 5.6 | (3.8, 7.4) | | 69 | 7.3 | (5.6, 8.9) | | 31 | 10.6 | (7.1, 14.1) | | 22 | 8.7 | (5.2, 12.2) | |
| Consider yourself a smoker | | | | | | | | | | | | | | | | | | | | |
| Yes | 533 | 30.4 | (28.2, 32.5) | <0.001* | 216 | 42.0 | (37.8, 46.3) | 0.222 | 247 | 48.0 | (43.6, 52.3) | <0.001* | 191 | 37.4 | (33.2, 41.6) | 0.484 | 161 | 31.5 | (27.5, 35.5) | 0.696 |
| No | 1221 | 69.6 | (67.5, 71.8) | | 433 | 58.0 | (53.7, 62.2) | | 748 | 52.0 | (47.7, 56.4) | | 113 | 62.6 | (58.4, 66.8) | | 97 | 68.5 | (64.5, 72.5) | |
| Exposed to Secondhand Smoking | | | | | | | | | | | | | | | | | | | | |
| Yes | 1376 | 78.1 | (76.2, 80.0) | <0.001* | 458 | 35.6 | (33.0, 38.2) | <0.001* | 763 | 58.2 | (55.5, 60.9) | 0.002* | 283 | 36.6 | (33.2, 40.0) | 0.993 | 241 | 31.0 | (27.8, 34.3) | 0.782 |
| No | 386 | 21.9 | (20.0, 23.8) | | 192 | 64.4 | (61.8, 67.0) | | 236 | 41.8 | (39.1, 44.5) | | 23 | 63.4 | (60.0, 66.8) | | 19 | 69.0 | (65.7, 72.2) | |
| Rules about cigarette smoking inside your home | | | | | | | | | | | | | | | | | | | | |
| Not Allowed | 956 | 54.7 | (52.3, 57.0) | <0.001* | 362 | 41.0 | (37.7, 44.2) | 0.279 | 648 | 71.8 | (68.8, 74.7) | <0.001* | 138 | 37.8 | (32.8, 42.8) | 0.487 | 108 | 30.2 | (25.4, 34.9) | 0.634 |
| Allowed ² | 793 | 45.3 | (43.0, 47.7) | | 285 | 59.0 | (55.8, 62.3) | | 346 | 28.2 | (25.3, 31.2) | | 166 | 62.2 | (57.2, 67.2) | | 150 | 69.8 | (65.1, 74.6) | |
| Live with smoker | | | | | | | | | | | | | | | | | | | | |
| Yes | 553 | 31.4 | (29.3, 33.6) | <0.001* | 210 | 39.7 | (35.5, 43.9) | 0.979 | 228 | 43.0 | (38.8, 47.2) | <0.001* | 165 | 38.0 | (33.4, 42.6) | 0.338 | 151 | 35.3 | (30.7, 39.8) | 0.007* |
| No | 1206 | 68.6 | (66.4, 70.7) | | 439 | 60.3 | (56.1, 64.5) | | 769 | 57.0 | (52.8, 61.2) | | 140 | 62.0 | (57.4, 66.6) | | 108 | 64.7 | (60.2, 69.3) | |

Missing values were not included in the table

*P Value <0.05

*P values was generated by Pearson Chi-Square

¹For those participants who responded smoked 0 days of the past 30 days and who responded “no” to ever daily smoked were categorized as non-smokers. Participants who smoked between 1 and 29 days were coded as smokers, non-daily. Those who reported smoking on 30 of the past 30 days were coded as smokers, daily

²Allowed were those participants who answered smoking is allowed in some places or at some times, smoking is allowed anywhere inside my home or there are no rules about smoking inside my home

Table 4 Multivariable models of social norm predictors, young adults, NYC

| | (SN1) How do most New Yorkers feel about cigarette smoking ^a | | (SN2) How do people who are important to you, like family and friends feel about cigarette smoking ^a | | (ST1) I keep tobacco smoking a secret from certain people ^b | | (ST2) I feel guilty when I smoke ^b | |
|--|---|--------------|---|--------------|--|--------------|---|--------------|
| | Disapprove | | Disapprove | | Agree | | Agree | |
| | OR | 95% CI | OR | 95% CI | OR | 95% CI | OR | 95% CI |
| Smoking habits¹ | | | | | | | | |
| Smoker non-daily | 1.76* | (1.10, 2.79) | 0.59* | (0.38, 0.94) | 1.84* | (1.14, 2.96) | 2.54* | (1.45, 4.45) |
| Smoker daily | REF | | REF | | REF | | REF | |
| Gender | | | | | | | | |
| Male | 1.29 | (0.94, 1.78) | 0.84 | (0.61, 1.16) | 1.20 | (0.86, 1.66) | 1.28 | (0.90, 1.82) |
| Female | REF | | REF | | REF | | REF | |
| Age | | | | | | | | |
| 18–24 | 0.80 | (0.58, 1.11) | 0.93 | (0.67, 1.30) | 1.05 | (0.75, 1.45) | 0.96 | (0.68, 1.37) |
| 25–26 | REF | | REF | | REF | | REF | |
| Race/ethnicity | | | | | | | | |
| Hispanic | 0.76 | (0.51, 1.12) | 0.55* | (0.37, 0.81) | 0.79 | (0.53, 1.18) | 1.09 | (0.71, 1.68) |
| Non-Hispanic Black | 1.69* | (1.03, 2.76) | 1.05 | (0.63, 1.74) | 1.45 | (0.89, 2.36) | 1.28 | (0.76, 2.16) |
| Asian/PI | 0.82 | (0.50, 1.36) | 0.94 | (0.57, 1.55) | 1.02 | (0.62, 1.69) | 0.66 | (0.37, 1.16) |
| Non-hispanic white | REF | | REF | | REF | | REF | |
| Education | | | | | | | | |
| Currently in college/college grad | 2.25* | (1.47, 3.45) | 1.96* | (1.31, 2.93) | 2.43* | (1.57, 3.76) | 2.82* | (1.73, 4.60) |
| Less than college ² | REF | | REF | | REF | | REF | |
| Consider yourself a smoker | | | | | | | | |
| Yes | 1.74* | (1.18, 2.57) | 0.80 | (0.55, 1.18) | 1.00 | (0.68, 1.48) | 1.19 | (0.78, 1.82) |
| No | REF | | REF | | REF | | REF | |
| Exposed to secondhand smoking | | | | | | | | |
| Yes | 0.42 | (0.17, 1.03) | 0.54 | (0.18, 1.50) | 0.35* | (0.12, 0.96) | 0.63 | (0.23, 1.77) |
| No | REF | | REF | | REF | | REF | |
| Live with smoker | | | | | | | | |
| Yes | 1.04 | (0.74, 1.46) | 0.38* | (0.24, 0.48) | 1.07 | (0.76, 1.51) | 1.81* | (1.24, 2.63) |
| No | REF | | REF | | REF | | REF | |
| Drink at least 5 alcoholic shots or drinks within a few hours | | | | | | | | |
| Yes | NA | | NA | | NA | | 1.75* | (1.10, 2.78) |
| No | NA | | NA | | NA | | REF | |

Adjusted for gender; age; race/ethnicity; education; secondhand smoking exposure and living with a smoker (Models SN1, SN2 and SN3)

Adjusted for gender; age; race/ethnicity; education; secondhand smoking exposure; living with a smoker and drink at least 5 alcoholic shots or drinks within a few hours in the past 30 days (Models SN4)

Bold values are statistically significant

CI Confidence interval, OR odds ratio, REF Reference Group, NA not applicable

*P < .05

¹For those participants who responded smoked 0 days of the past 30 days and who responded “no” to ever daily smoked were categorized as non-smokers. Participants who smoked between 1 and 29 days were coded as smokers, non-daily. Those who reported smoking on 30 of the past 30 days were coded as smokers, daily

²Less than college were those who answered left college and/or graduated high school/GED

^aReference Group is Neither/Approve

^bReference Group Neutral/ Disagree

Discussion

Our data demonstrate non-daily smokers perceive more stigma associated with smoking compared with daily smokers, in the first YA study using social norms data about smoking in NYC.

YA who reported New Yorkers disapproved of cigarette smoking were more likely to be non-smokers and non-daily smokers. More than half of participants reporting disapproval did not consider themselves smokers. NYC has had a comprehensive smoke-free air law since 2002, public smoking is not the norm, and most non-smokers and non-daily smokers concur. Studies have shown that anti-smoking policies are directly related to community disapproval of cigarette smoking, similar to our study [41, 42].

Many adolescent studies have focused on environmental factors, including friends, peers, family, school, the workplace, church, films, magazines radio and television [43, 44] that influence YA. Most social groups understand what is natural, expected and acceptable in a given context. When examining how people who are important to you feel about smoking (SN2), we found nonsignificant results, indicating NYC YA non-daily smokers were not influenced by these environmental factors. This may be due to study participant young age, having friends and family who smoke or are experimenting and, who approve of smoking. In this sample, smoking prevalence and perceived smoking prevalence were much higher than among NYC adults (16.1%) [45].

When assessing stigma, YA who agree they keep tobacco smoking a secret (ST1) were more likely to be non-daily smokers compared with daily smokers. Non-daily smokers were more likely to smoke at group events and social activities especially social smokers [7]. Non-daily social smokers rarely smoke alone and often smoke in group settings, usually on weekends. Non-daily smokers often consider themselves non-smokers who do not have an issue with smoking and can quit when they want [10]. Our study suggests that non-daily smokers are more likely to hide their habit from certain people due to smoking stigma. Overall, non-daily smokers do not see themselves as a ‘smoker’ [46].

YA who agree they felt guilty when they smoked (ST2) were more likely to be non-daily smokers, live with a smoker and engaged in binge drinking in the past 30 days. Our findings confirm YA non-daily smokers have more than double the odds of agreeing they felt guilty when they smoked compared with daily smokers. Research shows that alcohol consumption was associated with guilt/stigma feelings about smoking cigarettes [46]. Non-daily smokers living with smokers might not perceive smoking as a bad habit, but rather as something to join in socially,

on occasion. Many non-daily smokers will not smoke in front of employers, parents and some friends because they do not want to be perceived as a smoker [46]. Research indicates people identifying as non-smokers but smoking in social gatherings feel guilt or remorse more than those who identify themselves as daily smokers [46]. Since our study was conducted at bars, we presumed drinking alcohol may be a factor for non-daily smokers who participated. Other studies have indicated a relationship between drinking alcohol and smoking cigarettes [47, 48]. This study demonstrated non-daily smoking and binge drinking were associated with feelings of guilt when smoking.

YA smokers are generally resistant to cessation interventions developed for daily smokers. These mostly non-daily smokers do not consider themselves “smokers” and therefore are not trying to quit or get treated [36, 48]. Previous social norms studies have used their findings to improve population targeting through improved media campaigns and policies [26, 49, 50]. Our findings suggest psychosocial interventions could target messaging at YA’s with higher education levels and focus on negative social norms and smoking stigma. Media campaigns aimed at non-daily smokers may also reach this population [50]. Potentially, more non-daily YA’s will seek professional help by joining a tailored cessation program and be able to quit smoking permanently.

Limitations

There are some limitations. The data are cross-sectional and casual relationships or directionality cannot be presumed. Self-reported responses may be subject to response bias. Even with these limitations, this study contributes to a limited literature about YA regarding tobacco control social norms and stigma. Finally, there is no standard definition categorizing “young adults”. Papers reporting data from national surveys such as the Tobacco Use Supplement to the Current Population Survey, may discuss individuals ages 18–29 or 18–34, while other studies restrict the definition to ages 18–26. Other studies examining smoking and progression in smoking from adolescence to early adulthood may examine age groups straddling the adolescent/adult timeline, such as ages 14–22 or 15–24. Therefore, defining “young adults” is difficult and YA trend comparisons should be interpreted with caution.

Conclusion

NYC data shows an increase in non-daily smoking, particularly among YA [51]. This is concerning for tobacco cessation programs and smoking prevention, as non-daily smokers could become daily smokers. Smoking cessation strategies developed for older adult daily smokers may not

be as effective with YA non-daily smokers. A more targeted strategy for YA non-daily smokers may be necessary to garner more positive results.

Our study demonstrated YA non-daily smokers were more likely to report negative social norms about smoking and feel more stigma than YA daily smokers. YA smokers are susceptible to interpersonal and environmental influences. By identifying non-daily smokers, clinicians and health researchers may be able to modify educational and training programs by incorporating social norm and stigma awareness associated with smoking to better relate to YA non-daily smokers.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflicts of interest or financial disclosures to report.

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