Barriers to Effective Tobacco-Dependence Treatment for the Very Poor

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ABSTRACT. Objective: People who live in poverty have a high prevalence of smoking, are less likely to engage in evidence-based treatment, and find it harder to quit. Their beliefs about smoking and quitting can serve as barriers to quitting. Little is known about the smoking and quitting beliefs of the very poor (about U.S. $15,000 or less annual family income) because they tend not to be included in research. This study sought to assess beliefs about smoking and quitting by the very poor in relation to past quitting behavior and intention to quit in the future. **Method:** A survey was administered in person to residents in randomly selected addresses in two very impoverished Milwaukee, WI, ZIP codes during the day to ensure the inclusion of the very poor. **Results:** Six hundred fifty-four people completed the survey, a response rate of 78.3%. Sixty-eight percent reported annual household incomes of less than $15,000 compared with 30.8% in the community as a whole and 13.0% of households nationally. Self-reported smoking prevalence was 42.1%. Specific beliefs about smoking and quitting were related to past quit attempts and intentions to quit in the future. Both race and income predicted beliefs and quitting-related variables independently and jointly. **Conclusions:** Continued tobacco-control progress requires addressing specific populations with known high tobacco use. One of these populations is those with low income. Efforts to engage them in treatment will have to address specific beliefs about smoking and quitting. (*J. Stud. Alcohol Drugs, 73,* 874–884, 2012)

WHEN THE SURGEON GENERAL FIRST LINKED tobacco use with disease in 1964, smoking was an equal-opportunity killer, harming people of all sociodemographic strata (U.S. Department of Health Education and Welfare, 1964). Since then, tobacco use has become a class phenomenon with people living in poverty far more likely to smoke than others (Datta et al., 2006). In 2010, only 18.3% of adults with annual incomes at or above the poverty level were current smokers compared with 28.9% of adults below the poverty level (Centers for Disease Control and Prevention, 2011). Not surprisingly, this tobacco-use disparity contributes to the well-documented health disparity gap between income groups via tobacco-related diseases (Fagan et al., 2007; Fiscella and Williams, 2004; Jha et al., 2006; Vidrine et al., 2009). These class-based smoking disparities and their health consequences highlight the importance of bringing evidence-based tobacco-cessation treatments to those living in poverty.

Poverty is not only related to smoking prevalence and related health risks but also to a reduced likelihood of smoking cessation and receipt of cessation treatment (Browning et al., 2008; Chase et al., 2007). Smokers facing educational and economic challenges are less likely to try to quit than are other smokers and are less successful when they do try (Gilman et al., 2003, 2008; Giskes et al, 2006; Hiscock et al., 2011, 2012; Levy et al., 2005; Sheffer et al., 2012). A lack of cessation success might reflect, in part, a failure to use evidence-based treatment during a quit attempt. Cummings and Hyland (2005) found that when smokers living in poverty tried to quit, they were less likely than other smokers to use evidence-based treatments such as nicotine replacement treatment (see also Honjo et al., 2006). In addition, in a comparison of smokers receiving Medicaid versus other smokers, Murphy et al. (2005) found that 41% of smokers drawn from the general population reported prior use of nicotine replacement medications compared with only 20.3% of smokers on Medicaid. Importantly, a failure to use evidence-based treatment is probably not the sole reason those living in poverty are less likely to quit; other factors such as greater stress, competing needs, more permissive tobacco-use norms, and neighborhood deprivation may play a role (Datta et al., 2006; Flint and Novotny, 1997; Shohaimi et al., 2003; Stead et al., 2001). However, understanding why those living in poverty are less likely to use evidence-based treatment might provide insight into how to increase treatment use by this group of smokers.

Those living in poverty may be less likely to use an evidence-based cessation method for a variety of reasons,

Received: February 8, 2012. Revision: May 15, 2012.

This research was supported by the Wisconsin Partnership Fund of the University of Wisconsin School of Medicine and Public Health (OAC #1243) and by National Cancer Institute Grant 9P50CA143188-11.

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including greater reliance on emergency departments for acute care, less money to purchase over-the-counter medications, and a lack of health insurance (DeNavas-Walt et al., 2009; Urban Institute, 2009). In addition, researchers have identified that specific knowledge deficits and beliefs more prevalent in those living in poverty could influence whether a quit attempt is made and whether an attempt is made using an evidence-based method. Knowledge deficits included less knowledge about the harmful effects of smoking (Cummings et al., 2004; Oakes et al., 2004; Siahpush et al., 2006; Wilkinson et al., 2009) and less knowledge about the availability of effective treatment (McMenamin et al., 2004, 2006; Murphy et al., 2003, 2005; Roddy et al. 2006). Those living in poverty were also less knowledgeable than others about the effectiveness of different methods of quitting (Roddy et al., 2006). In their sample of Medicaid enrollees, McMenamin et al. (2006) found that the proportion of enrollees who thought self-help was effective (34%) rivaled the proportion who thought bupropion (Wellbutrin and others; 33%) and nicotine gum (32%) were effective. Further, 29% thought hypnosis was effective, whereas only 24% thought telephone counseling was effective. Also, beliefs that cessation medications are ineffective, dangerous, addicting, or too costly were more prevalent among those living in poverty and correlated negatively with intention to quit and quit attempts (Bansal et al., 2004; Borland et al., 2011; Cummings and Hyland, 2005; Cummings et al., 2004; Fu et al., 2007; Okuyemi et al., 2006; Roddy, et al., 2006; Vogt et al., 2008). Finally, qualitative studies with both smokers in general and impoverished smokers have determined that many smokers believe "willpower" to be a crucial element in successful quitting (Roddy et al., 2006; Vogt et al., 2008; Wiltshire et al., 2003). Balmford and Borland (2008) found that 35% of smokers in their sample agreed that "using aids to quit is a sign of weakness, if you really want to quit then you will be able to do it by yourself" (p. 22). This belief was significantly more common among those with less education (Balmford and Borland, 2008).

Many of the large research studies on smoking and quitting beliefs have used telephone surveys to gather data (Balmford and Borland, 2008; Bansal et al., 2004; Borland et al., 2004; Brownson et al., 1992; Cummings et al., 2004; Hammond et al., 2004; McMenamin et al., 2006; Murphy et al., 2005), and impoverished individuals tend to be underrepresented in such surveys (Brick et al., 2006; Shebl et al., 2009). For instance, 21.6% of adults in low-income households had no landline service in 2007 (Blumberg and Luke, 2009), and 17% used wireless phones only (Blumberg and Luke, 2007). The growth of a wireless population has introduced new demographics into survey research (e.g., many cell phone–only households limit use to outgoing calls only) (Pew Research Center, 2008).

The current study assessed knowledge and beliefs about smoking and quitting using a sampling and data collection methodology that ensured the inclusion of the "very poor" (i.e., those with annual family incomes of about U.S. $15,000 or less). The data collection method involved in-person surveys concentrated in neighborhoods and at times that favored enrollment of very poor individuals. This study examined the relations between knowledge and beliefs on the one hand and past quitting behaviors and intention for future quitting on the other to determine whether such beliefs might have motivational significance. These relations were also analyzed as a function of race versus income. These data were intended to inform efforts to increase consumer demand for and use of evidence-based tobacco-cessation interventions, especially by very poor persons.

Method

The survey was part of a 3-year community-based research project designed to increase the use of evidence-based tobacco-dependence treatment by individuals living in an impoverished Milwaukee, WI, central city ZIP code area (53212). For baseline comparison purposes, the survey was also conducted in a noncontiguous impoverished Milwaukee central city area, the 53208 ZIP code. Based on the data from the 2000 Census, the combined population of these two ZIP codes was 65,951 with 52.3% female; a median age of 28.0 years; 56.4% African American, 31.3% White, and 7.8% Hispanic/Latino; a per capita income of $12,832 with 33% living below the federal poverty line; and 56% with a high school diploma or less (U.S. Census Bureau, 2000).

Surveyors were recruited from the community through staff from the Vincent Family Resource Center, Milwaukee, WI—a program of the Society of St. Vincent de Paul, a not-for-profit agency serving these Milwaukee communities. The five surveyors were African American or Hispanic, between 18 and 25 years old; two were female. Training was provided by the principal investigator (B.C.), and the quality was maintained by directly observing the surveyors on a regular basis with periodic re-training and feedback based on quality checks of the collected survey data.

The survey comprised 68 questions reflecting the consensus preference of a community advisory group that provided guidance to the overall project. The survey items addressed background/demographic data, employment status, gender, and income (10 items); past and current smoking including past efforts to quit and cut down (27 items); future efforts to quit (9 items); and beliefs about quitting and smoking (i.e., smoking is acceptable and normative, the nature of quitting, effectiveness of quit methods, use of medicines to quit, and access to treatment; 20 items). Finally, there were two open-ended questions regarding reasons for quitting and the best way to quit.

Eight thousand randomly selected residential, nonseasonal, non–post-office-box addresses (4,000 from each ZIP

code) were obtained from Marketing Systems Group, a commercial vendor of postal addressees. These addresses were plotted to streets to increase the efficiency of the surveyors, who were instructed to vary north–south streets with east–west streets to ensure that the entire geographic area was visited from boundary to boundary. Each residence was visited at least twice before it was considered unobtainable.

Surveyors worked in teams, wore identifying jackets, and carried picture identification cards. To ensure that the sample contained a predominance of low-income residents, the surveyors worked mostly from 9 A.M. to 4 P.M., Monday through Friday, when the unemployed rather than those with jobs were more likely to be home. In addition, surveys were occasionally done on Saturdays and in the early evenings during weeknights. Following a brief introduction describing the sponsors of the survey, permission was obtained to determine if the person who answered the door was eligible to take the survey—that is, was 18 years or older and a current smoker (smoking on a daily basis or at least four cigarettes per week). Those eligible were told about the survey, its voluntary and anonymous nature, and the provision of a $10.00 gift card as a thank you. A written "Research Consent Information" form was provided to and retained by the participant. Verbal consent to administer the survey was then obtained. Those willing to participate were given a written version of the survey to follow along with the surveyor's oral administration. The survey took approximately 20 minutes to administer. All written materials were available in Spanish. However, because only one of the surveyors was fluent in Spanish, not all Spanish-speaking participants could be accommodated. At the conclusion of the survey, the participant was asked to address an envelope with his or her home address; this envelope was used to mail the gift card. The addressed envelope was kept separate from the survey itself until it was mailed to maintain participant anonymity. Finally, project participants from the 53212 ZIP code but not those from the 53208 ZIP code were given smoking-cessation information because residents in this latter ZIP code served as a no-intervention control group in the larger project. Survey data were collected between October 2008 and July 2009. The survey was approved by the University of Wisconsin Institutional Review Board.

Surveys were scanned into a database and verified. Responses were tabulated for each question. Open-ended questions were thematically scored independently by two judges and their concurrence (correlation) measured. All disagreements were adjudicated by a third, senior judge. The relations between beliefs and past quitting behavior/future quitting intentions were explored by appropriate statistical tests (chi-square, *t* tests), and the relations among race, income, beliefs, and past quitting behavior/quitting intentions were examined in a series of multiple regressions and logistic regressions.

Results

Participation

Although the project target for completed surveys was 400 from the 53212 ZIP code and 300 from the 53208 ZIP code, resource limitations resulted in only 358 surveys from the 53212 ZIP code and 296 from the 53208 ZIP code (654 total surveys). As depicted in Figure 1, the eligibility questions were administered to 1,986 people, of whom 835 were eligible. Of these, 654 (78.3%) competed the survey.

Level of impoverishment

Sixty-eight percent of survey respondents reported an annual household income of less than $15,000 compared with 30.8% of persons in these communities in the 2000 Census, $\chi^2(4) = 414.9$, $p < .01$. In contrast, in 2009, 13.0% of U.S. households had annual incomes of less than $15,000 (U.S. Census Bureau, 2012). Survey respondents were also less educated than peers in their communities, $\chi^2(4) = 191.1$, $p < .01$. For example, 81.6% of survey respondents older than age 25 had only a high school diploma, a General Educational Development (GED) credential, or less versus 56.1% reported in the 2000 Census for these ZIP codes. Among those in the labor force (excluding the 44.1% that are not in the labor force—see Table 1), 28.8% of survey respondents were unemployed compared with 14.7% reported in the 2000 Census, $\chi^2(1) = 43.0$, $p < .01$. A large number of respondents had no health insurance (35.4%), and 47.8% were on Medicaid; only 6.3% had employer-provided health insurance. The median age of survey respondents was 41.0 years, a somewhat older sample than the median age in the surrounding community. Fifty-four percent of survey respondents were younger than 45 years, whereas the 2000 Census reported 61.0% of residents were younger than 45, $\chi^2(8) = 68.2$, $p < .01$. There were no gender differences between the survey and Census samples—50.5% of survey respondents and 52.3% of the Census were female, $\chi^2(1) = 0.72$, $p > .05$. A greater percentage of survey respondents were African American than was typical in the surrounding community (79.4% vs. 56.9%), $\chi^2(2) = 130.1$, $p < .01$. Finally, there was no difference in the percentage who were Hispanic/Latino in the two samples (5.9% of survey respondents and 7.8% in the 2000 Census).

Smoking description

Smoking prevalence was calculated by dividing the number of smokers (those eligible to take the survey whether or not they did so) by the number for whom smoking status was known (eligible smokers plus not eligible because they did

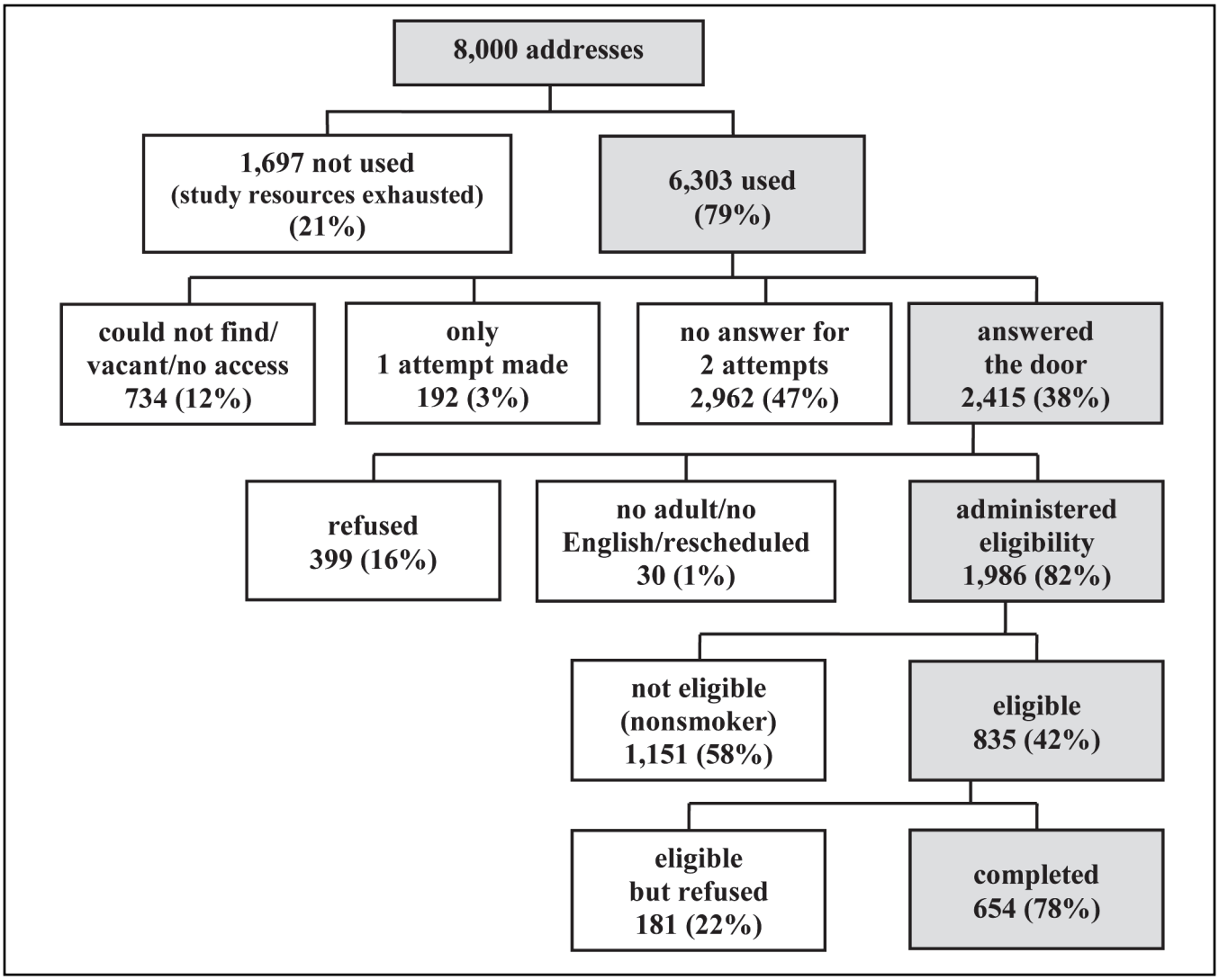

FIGURE 1. Study participation: Consort table. White boxes represent addresses or people dropped from the study. Gray boxes represent addresses or people retained at that given step.

not smoke). (Smoking status was unknown for 429 [17%] of those who answered the door.) The smoking prevalence in this very impoverished sample was 42.1%. The average age that daily smoking began was 17.3 years. Current average daily cigarette consumption was 12.6. On average, cigarettes were consumed on 27.6 days of the past 30. Regarding the first cigarette in the morning, 41.3% of respondents smoked within the first 5 minutes, 25.1% between 5 minutes and half an hour, 11.4% in the second half hour, and 21.1% after the first hour. Most of the respondents (84.4%) usually (more than half the time) smoked menthol cigarettes.

Quitting

When respondents were asked how many times they tried to quit in their lifetime, the average was 2.9; more than a third, 37.7%, replied "never." Among those who had ever tried to quit, half (50.5%) tried to quit in the past year. When asked if they plan to quit in the next 6 months, 31.6% endorsed "absolutely"; 18.9%, "probably"; 21.9%, "maybe"; and 27.5%, "no." When asked about the importance of quitting, 47.8% responded "extremely"; 37.8%, "somewhat"; and 12.8%, "not at all." For those who had tried to quit, quitting cold turkey was the most commonly reported method (77.6%). By comparison, only 18.7% had used any medication, 13.1% obtained counseling, and 9.7% called the Wisconsin Tobacco Quit Line.

Beliefs

The majority of survey respondents believed that smoking is acceptable, at least under some circumstances. For ex-

ample, 64.7% agreed that it was "OK" for people to smoke a little or some of the time (Table 1). Most of the respondents, 83.0%, believed that "Quitting smoking is just a matter of willpower." In addition, smoking was seen as normative in this population. When asked how many people in their community smoke, the average respondent answer was 73.3% (the overall smoking rate of Wisconsin adults was 20.0% in 2008) (Palmersheim et al., 2011). Quitting cold turkey, on one's own, or with just willpower was identified as the best way to quit by 63.1% of the respondents (in response to an open-ended question about the best way to quit).

Respondents tended to discriminate poorly between relatively effective and ineffective methods of quitting. When asked how many smokers out of 100 would quit if they did so using various methods, respondents reported 44.2% would quit successfully using willpower alone. Evidence-based methods such as the use of medicines, counseling/coaching, and quitlines were perceived as less effective than willpower (Figure 2). Many respondents (41.8%) agreed with the statement, "Counseling doesn't help you stop smoking." Almost half of respondents thought that medications could be dangerous: 48.5% agreed with the statement, "Medications to help you stop smoking can be more dangerous than continued smoking," and an additional 23.9% did not know or were not sure. Only 7.8% of responses to the open-ended question about the best way to quit included medication of any sort. A majority of respondents had never heard of the Wisconsin Quit Line (56.1%). Of those who had heard, 28.9% did not think or were not sure/didn't know that the Wisconsin Quit Line provided counseling, and 61.9% did not think or did

TABLE 1. Selected survey responses (n = 654)

Variable	*M* or %	Variable	*M* or %
Background/demographic		Confidence of succeeding if try	
Gender, female	50.5%	(1–10 scale, 10 = *very likely*), *M*	5.3
Age, *M* years	41.3	Beliefs	
Race		People should not smoke	
African American	79.4%	Agree	67.8%
White	16.0%	Disagree	25.6%
Ethnicity, Hispanic/Latino	5.9%	Don't know/not sure	6.6%
Highest education		OK to smoke a little or some of the time	
Did not complete high school	28.3%	Agree	64.7%
High school diploma/GED	53.3%	Disagree	29.6%
Health insurance		Don't know/not sure	5.6%
None	35.4%	OK to smoke if not around children	
Medicaid	47.8%	Agree	68.0%
Employment		Disagree	30.1%
Not in labor force		Don't know/not sure	2.0%
(retired, disabled, student, homemaker)	44.1%	OK to smoke if done outside	
Employed	39.7%	Agree	66.1%
Unemployed	16.1%	Disagree	30.1%
Annual household income, U.S. $		Don't know/not sure	3.8%
<$15,000	68.0%	Counseling doesn't help to quit	
$15,000–$24,999	18.3%	Agree	41.8%
≥$25,000	13.5%	Disagree	39.0%
Smoking description		Don't know/not sure	19.6%
Age at regular smoking onset, *M* years	17.3	Medications can be more dangerous than smoking	
Cigarettes/day, *M*	12.6	Agree	48.5%
Days of smoking in past 30, *M*	27.6	Disagree	27.6%
Smoke menthol more than half the time	84.4%	Don't know/not sure	23.9%
Minutes after waking until first cigarette of day		Shouldn't try to quit if a lot of stress in life	
Within 5 minutes	41.3%	Agree	45.6%
5–30 minutes	25.1%	Disagree	47.9%
30–60 minutes	11.4%	Don't know/not sure	6.4%
Never tried to quit	37.7%	Can't quit if you live with smoker	
Quit attempts in lifetime, *M*	2.9	Agree	55.2%
Plan to quit in next 6 months		Disagree	41.7%
Absolutely	31.6%	Don't know/not sure	3.0%
Probably	18.9%	Quitting is just a matter of willpower	
Maybe	21.9%	Agree	83.0%
No	27.5%	Disagree	14.7%
Importance of quitting		Don't know/not sure	2.2%
Extremely	47.8%	Perceived percentage of adults in	
Somewhat	37.8%	neighborhood who smoke, *M*	73.3%
Not at all	12.8%	Perceived percentage of adults in	
How hard to quit		Wisconsin who smoke, *M*	72.3%
(1–10 scale, 10 = *very hard*), *M*	7.8		

Notes: GED = General Educational Development credential.

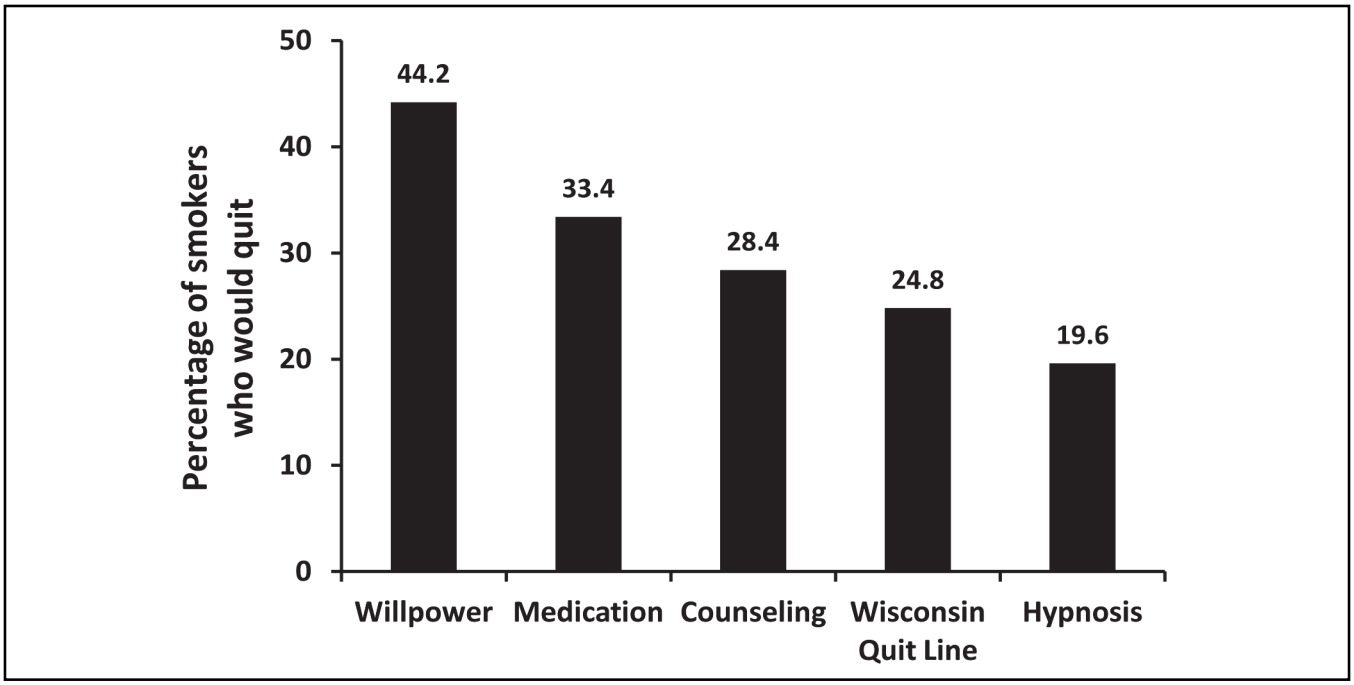

FIGURE 2. Perceived effectiveness of quit methods

not know/weren't sure that the Wisconsin Quit Line provided medication. (The Wisconsin Quit Line provided 2 weeks of free medication at the time of the survey.)

Relations between belief barriers and quitting

The 20 beliefs queried in this study were studied relative to three measures of past quit/reduction attempts: number of lifetime quit attempts, number of quit attempts in past year, and cutting down in past year. Those specific beliefs related to past quitting behavior are shown in Table 2. These same 20 beliefs were also studied relative to each of 12 possible methods of quitting. Smokers who thought it was acceptable to smoke as long as it was done outside were less likely to have called the Wisconsin Quit Line than were other respondents, $\chi^2(1) = 5.58$, $p = .018$. Smokers who believed quitting is just a matter of willpower were more likely than other respondents to try quitting cold turkey, $\chi^2(1) = 11.24$, $p < .001$, but less likely to use self-help materials, $\chi^2(1) = 5.84$, $p = .016$; join a quit-smoking group, $\chi^2(1) = 4.09$, $p = .043$; use medication, $\chi^2(1) = 14.00$, $p = .000$; call the Wisconsin Quit Line, $\chi^2(1) = 14.56$, $p = .000$; or use a quitting website, $\chi^2(1) = 18.11$, $p = .000$.

Beliefs were also related to possible future quitting, specifically, to five of the nine measures of future quitting (Table 3). These results indicate a willingness to ask for help when

TABLE 2. Tobacco beliefs and past quit behavior ($n = 654$)

Belief	No. of lifetime quit attempts (numerical)	No. of tries in 12 months (numerical)	Cutting down in the past 12 months (4 categories)
OK to smoke if not done around children		fewer**	less likely* (25.7% vs. 35.6%)[a]
OK to smoke as long as it is done outside	fewer*		
OK to smoke a little or some of the time		fewer*	
Quitting is just a matter of willpower			less likely* (24.7% vs. 30.0%)[a]
Counseling doesn't help you quit smoking			less likely* (28.0% vs. 34.2%)[a]
Coaching/counseling is seen as more effective		more*	
Hypnosis is seen as more effective		more**	
Wisconsin Quit Line is seen as more effective		more*	
If have heard of the Wisconsin Quit Line			more likely* (53.8% vs. 44.4%)[b]

[a]Percentage "yes, a lot"; [b]percentage "yes, a lot" and "yes, quite a bit."
*$p < .05$; **$p < .01$.

TABLE 3. Tobacco beliefs and possible future quit behavior (n = 654)

Endorsed belief	Do you plan to quit in the next 6 months? (4 categories)	If you decide to quit, will you get/seek help? (3 categories)	If you tried to quit, would you succeed? (1–10 scale)	How important is it that you quit? (3 categories)	How ready are you to quit? (1–10 scale)	How hard will it be for you to quit? (1–10 scale)
People should not smoke	more likely** (36.5% vs. 18.8%)[a]	more likely* (16.2% vs. 10.2%)[b]		more important** (54.8% vs. 27.9%)[c]	more ready**	
OK to smoke a little or some of the time	less likely* (28.4% vs. 40.3%)[a]	less likely** (11.1% vs. 23.1%)[b]		less important** (38.1% vs. 64.8%)[c]	less ready**	
OK to smoke if not done around children	less likely** (25.3% vs. 47.9%)[a]			less important** (37.9% vs. 64.8%)[c]	less ready**	
OK to smoke as long as it is done outside	less likely* (28.2% vs. 40.2%)[a]	less likely* (11.6% vs. 19.6%)[b]		less important** (41.0% vs. 58.5%)[c]	less ready**	
Quitting is just a matter of willpower			more likely*			easier*
As willpower is seen as more effective			more likely*			easier**
As counseling/coaching is seen as more effective	more likely*	more likely**	more likely**	more important**	more ready*	easier**
As medication is seen as more effective		more likely**				easier*
As the Wisconsin Quit Line is seen as more effective		more likely**	more likely*			
As hypnosis is seen as more effective		more likely**	more likely*		more ready*	
If have heard of the Wisconsin Quit Line		more likely* (17.3% vs. 13.1%)[b]		more important* (90.4% vs. 84.2%)[d]		
Medications are more dangerous than smoking		less likely* (14.3% vs. 18.5%)[b]				
Don't quit if stress in your life		more likely* (65.1% vs. 54.4%)[e]	less likely*			harder*
Can't quit if you live with a smoker	less likely* (27.7% vs. 38.4%)[a]	more likely* (64.9% vs. 54.1%)[e]	less likely**	less important* (42.2% vs. 53.2%)[c]		harder*

[a]Percentage "absolutely yes"; [b]percentage "extremely likely"; [c]percentage "extremely important"; [d]percentage "extremely or somewhat important"; [e]percentage "extremely or somewhat likely."
*p < .05; **p < .01.

quitting was more likely for smokers who believed people should not smoke. But a willingness to ask for help was less likely among smokers who believed that it is acceptable to smoke a little or some of the time. Also, as the effectiveness of willpower as a way to quit increased, the inclination to ask for help decreased.

Racial versus income differences

Within this very impoverished sample, there were African American–White racial differences as well as income differences. For example, the African American respondents were older (42.3 vs. 38.5), $t(600) = 2.27$, $p < .05$, and less educated, $\chi^2(6) = 53.9$, $p < .01$, than the White respondents; were more likely to smoke menthol cigarettes most of the time (92.2% vs. 48.1%), $\chi^2(3) = 128.6$, $p < .01$; were more likely to have their first cigarette sooner after waking, $\chi^2(3) = 9.8$, $p < .05$; and were less likely to ask for help should they decide to try to quit, $\chi^2(7) = 6.1$, $p < .01$. African Americans differed from Whites on 8 of the 20 beliefs (Table 4).

Despite a restricted range of incomes, some responses differed as a function of income level. For example, compared with those with higher incomes, those with lower incomes were less educated, $\chi^2(18) = 106.2$, $p < .01$; more likely to use menthol cigarettes more than half the time, $\chi^2(3) = 44.6$, $p < .01$, and to smoke sooner after waking, $\chi^2(9) = 19.4$, $p < .05$; less likely to ask for help should they decide to quit, $\chi^2(6) = 17.4$, $p < .01$; and more likely to agree that quitting smoking is just a matter of willpower, $\chi^2(3) = 18.9$, $p < .01$.

TABLE 4. Differences between beliefs of African Americans (n = 496) and Whites (n = 99)

Belief	African Americans, as compared with Whites
People should not smoke	more likely to agree[a,]** (85.1% vs. 74.4%)
It is OK for people to smoke if they don't do it around children	more likely to disagree[a,]** (20.9% vs. 9.8%)
It is OK for people to smoke a little or some of the time	more likely to disagree[a,]* (20.4% vs. 11.8%)
Quitting smoking is just a matter of willpower	more likely to agree[a,]** (84.7% vs. 66.7%)
What percentage of your neighbors smoke?	higher (78.5% vs. 59.2%)[b,]**
What percentage of Wisconsin adults smoke?	higher (78.2% vs. 57.7%)[b,]**
If used willpower alone, how many would quit?	more (47.4% vs. 34.2%)[b,]**
Have you heard of the Wisconsin Quit Line?	fewer (42.2% vs. 53.9%)[a,]*

[a]Chi-square test; [b]t test.
*p < .05; **p < .01.

Table 5. Race versus income as predictors of beliefs

Belief	Predictor
People should not smoke	race,** income**
It is OK for people to smoke if they don't do it around children	race**
It is OK for people to smoke a little or some of the time	race*
Quitting smoking is just a matter of willpower	race,** income**
What percentage of your neighbors smoke?	race**
What percentage of Wisconsin adults smoke?	race**
If used willpower alone, how many would quit?	race**

Notes: Comparison groups for race were African American versus White; comparison groups for income were <$15,000, $15,000–$24,999, $25,000–$49,999, $50,000-$74,999, ≥$75,000.
*$p < .05$; **$p < .01$.

Race and income were related, $\chi^2(3) = 43.6$, $p < .01$. Seventy-three percent of African Americans in this sample reported less than $15,000 annual income, whereas 49.5% of Whites did so. A series of multiple regressions, logistic regression, and nominal regressions were conducted to evaluate the independent contribution of race versus income to the variables. For 11 variables, only race was a significant predictor; for 4 variables, only income was a significant predictor; and for 9 variables, both race and income were significant predictors. For example, only race predicted intention to quit in the next 6 months, only income predicted an intention to get help for a quit attempt, and both race and income predicted the importance of quitting. Table 5 presents the results of these analyses for the 20 belief questions. Race was the only predictor for five of these, whereas both race and income predicted two beliefs.

Discussion

This research adds to the knowledge about smoking beliefs and attitudes in the following ways: (a) it focuses on a population with a high prevalence of smoking—the very poor—often not included in similar research, (b) it assesses a broad range of beliefs not only about smoking but also about quitting, and (c) it examines the relative contribution of race and income to these beliefs.

This study successfully identified and assessed beliefs and attitudes in a very impoverished population. The survey respondents were significantly more impoverished than those captured in recent Census data on this community; 68% of our sample reported less than $15,000 in annual income. In addition, the surveyed individuals smoked at a rate (42%) double the overall adult U.S. rate (20.6%) (Centers for Disease Control and Prevention, 2009), infrequently used evidence-based cessation treatments during their quit attempts, and were skeptical about evidence-based cessation methods. The smokers in the sample tended to be daily smokers, but they smoked at fairly low rates, perhaps reflecting their financial constraints. Most smoked menthol cigarettes. The need to reach this population with tobacco-dependence treatment was illustrated by the finding that more than a third had never tried to quit. Also, only 18.7% of the sample had ever used a medication in making a quit attempt, which is lower than use rates reported in most other research (Ryan et al. 2011).

The survey also documented prevalent beliefs that may discourage both quit attempts and use of evidence-based treatments. The majority of the respondents believed that smoking is normative and that it is acceptable to smoke under some conditions. Certainly such beliefs may reduce the motivation to quit in these individuals. Similarly, their beliefs that quitting is just a matter of willpower and that using willpower is the most effective way to quit likely interfere with asking for assistance and using evidence-based treatment. A fairly high proportion of the sample also endorsed beliefs that cessation medications are dangerous and that counseling is ineffective. This is consistent with the results of a telephone survey of smokers that found African Americans more likely to endorse concerns about the general harm and addictive potential of medication and that race and education, marginally, predicted self-report use of pharmacotherapy (income was not measured) (Ryan et al., 2011). Clearly such beliefs may discourage the use of such evidence-based treatments.

The beliefs listed above appeared to be consequential; that is, significantly related to past quitting behavior and future intentions to quit. For example, beliefs that it is acceptable to smoke under some conditions and that willpower alone is sufficient to quit were related to fewer past quit attempts and a disinclination to quit in the future. In contrast, other beliefs (e.g., that counseling is effective) were positively related to more past quit attempts and greater intention to quit in the future. These results suggest that efforts to address and modify these beliefs might result in more quit attempts using evidenced-based methods. There is already some evidence that interventions do change beliefs and affect quit attempts and abstinence, but the mechanism(s) of change may not be obvious. Willemsen et al. (2006) recruited smokers interested in quitting and provided them with a "decision aid kit" via the mail, which provided information about effective and ineffective methods of quitting. They found that, compared with a randomly formed control group, smokers who received the aid kit had a greater chance of making a quit attempt and being abstinent for 7 days, but they were no more likely to use an evidenced-based quit method. The current study suggests the need for more research on how to modify quitting-relevant beliefs and how to test their impact on quitting—especially in underserved populations where such beliefs are so prevalent.

Quitting-relevant beliefs covaried by both race and income, even within this relatively homogenous sample (i.e., almost uniformly poor, about 80% African American). If interventions were used to alter such beliefs, the current findings could be used to guide the development or applica-

tion of the interventions. For example, African Americans expressed a greater belief in the effectiveness of willpower for quitting. African Americans, therefore, might benefit especially from an intervention that stressed that evidence-based treatments such as counseling could actually increase "willpower" (or determination to succeed, self-efficacy). Similarly, very poor smokers might respond to illustrations that make the economic costs of smoking more salient (Pisinger et al., 2011).

In addition to the substantive significance of the findings, this research supported the survey strategy used to identify and assess very poor persons. This strategy—a house-to-house, in-person survey conducted within a generally impoverished neighborhood primarily on weekdays, between 9 A.M. and 5 P.M.—was highly effective in enrolling individuals with significant poverty and a high prevalence of smoking.

It is unclear why poverty is associated with tobacco use, difficulty in quitting, and particular beliefs about tobacco use and quitting. The number and types of explanatory factors are legion, ranging from trait-like person factors associated with poverty, lack of opportunities (e.g., other sources of reinforcement), and constraints on knowledge or education to a concentration of specific tobacco risk factors or contexts associated with impoverishment (e.g., high smoking prevalence, lack of environmental constraints on smoking, smoking advertisements). Although this study highlights the correlations between poverty and beliefs about smoking and quitting, it does not shed light on whether poverty itself is a risk factor for particular tobacco beliefs or merely a marker for other risks. For example, poverty is a marker for financial strain, and there is a direct association between changes in level of financial strain and probability of smoking (Shaw et al., 2011). Further, within a predominantly lower socioeconomic sample of smokers, baseline financial strain predicted lower rates of abstinence for participants in smoking-cessation treatment (Kendzor et al., 2010). Similarly, it is unclear why poverty is related to poor health. Exposure to hazardous wastes, air pollution (including parental smoke as an indoor toxicant), water pollution, ambient noise, residential crowding, poor housing quality, and safety are all risk factors that may mediate the relation between poverty and poor health (Braubach and Fairburn, 2010; Evans and Kantrowitz, 2002). Adding information about other potential risk factors—such as financial strain, mental illness, exposure to other poverty-related risks, health status, and social, normative modeling and support of smoking—may shed light on the relationship between poverty and tobacco beliefs.

This study has significant limitations. Because the sampling methodology was designed to increase data collection from the very impoverished, the resulting sample was not representative of the overall community from which it was drawn. Thus, results cannot be generalized to the poor in general. In addition, because the survey recruitment focused on very poor individuals per se, we were not able to determine how other smokers would have responded to these specific questions. Therefore, we cannot draw strong conclusions about the extent to which the observed response patterns are specific to very poor smokers. The inclusion of comparison groups of higher socioeconomic status smokers would address this and put the current findings in a population perspective and should be a direction for future research. Second, this study examined beliefs as if they were independent of one another. This is very likely not true, and future research might be able to identify particular belief profiles to which interventions could be tailored. Third, this was a cross-sectional, correlational study. As a result, beliefs, current smoking, past quitting behavior, and intention for future quitting were all measured at the same time. Longitudinal data are needed to test whether specific beliefs predict the likelihood of future quit attempts and choice of quitting method.

This study characterizes beliefs and attitudes about smoking and smoking cessation among very poor smokers, a group of individuals rarely assessed adequately in smoking-related surveys. The beliefs and attitudes assessed are thought to affect the likelihood that a smoker will make a quit attempt and use evidence-based cessation treatment. Indeed, endorsement of these putatively dysfunctional beliefs was common in this sample and related to past quit attempts and methods, motivation to quit, and future intentions to quit. These findings underscore the need to address these issues in very poor smokers if we are to effectively engage them in evidence-based tobacco-dependence treatments and help them meaningfully reduce their risk of smoking-related disease.

Acknowledgments

The authors gratefully acknowledge the help of Wendy Theobald, Ph.D., and Linda Kurowski in the preparation of this manuscript and John Christiansen and Su-Young Kim, Ph.D., for data analysis assistance.

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