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Offering Smoking Treatment to Primary Care Patients in Two Wisconsin Healthcare Systems: Who Chooses Smoking Reduction Versus Cessation?

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Abstract

Smokers unwilling to make a quit attempt can still benefit from smoking intervention. However, it is unclear what proportion of smokers will enter such a Motivation phase intervention, and whether such an intervention attracts different types of smokers than does abstinence oriented treatment. We conducted a study from June 2010 to October 2013 based on a chronic care model of tobacco treatment among study eligible primary care patients (N=1579; 58% women, 89% White) presenting for regular health care visits in southern Wisconsin, U.S. Medical assistants, prompted via the electronic health record (EHR), invited smokers (n=10,242) to learn more about treatment options to help them either reduce their smoking or quit. Of those invited to learn more who were then reached by study staff, 10.2% (n = 1046) reported interest in reduction treatment and 24% (n = 2465) reported interest in cessation treatment. Patients who selected and ultimately entered reduction (n=492) versus cessation (n=1087) were more likely to report: older age; a history of anxiety; lower motivation to quit; lower primary dependence motives; more close friends or family who smoke; and a greater interval since their last quit attempt ($p < .05$). Results suggest that Motivation phase treatment aimed at smoking reduction may increase the proportion and range of smokers inducted into tobacco treatment.

Tobacco dependence is a chronic disease, and as such, typically requires repeated intervention over time. ¹ The Phase-Based Model ² identifies phases of the cessation process

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Conflict of Interest

The authors declare no conflict of interest.

that offer different mixes of opportunities and challenges (e.g., the Motivation, Preparation, Cessation, and Maintenance phases). Most research has focused primarily on treating smokers who are already motivated to make aided quit attempts (i.e., who are in the Preparation and/or Cessation phases). However, at any point in time, the great majority of smokers are unwilling to make a quit attempt.³⁻⁸ Thus, most smokers leave health care visits without treatment for tobacco dependence.⁸⁻¹⁰

Although many smokers attending health care visits are unwilling to make an aided quit attempt, some are likely to be willing to reduce their smoking as part of a Motivation phase treatment strategy. Reduction could have several benefits. Smoking reduction treatment can increase rates of quit attempts, amount of smoking reduction, use of evidence-based cessation treatment, and attainment of long-term abstinence amongst those who initially decline cessation treatment.^{1,3,11} In addition, the offer of Motivation phase treatment aimed at smoking reduction might increase the proportion of smokers inducted into treatment, and perhaps also increase the *breadth or range* of the smoking population inducted into treatment. That is, it might recruit smokers who are otherwise unlikely to enter evidence-based treatment; and it might serve those who would be underserved if only cessation treatment was offered. Thus, it is important to determine if the availability of reduction treatment appeals to types of smokers who typically avoid smoking cessation treatment. It is also important to determine if reduction treatment attracts types of smokers who tend to do poorly when only cessation treatment is offered. If so, reduction treatment may provide such smokers the additional preparation they need to be successful when they do make quit attempts.

Cook et al.³ recently conducted an experiment in which medical assistants were prompted by the electronic health record (EHR) to ask smokers presenting for primary health care visits if they were interested in receiving either smoking cessation treatment or treatment with a smoking reduction goal. Interested individuals were then electronically referred to study personnel for treatment screening and enrollment (see screening criteria in Methods). Reduction-goal treatment was described to patients as treatment that was intended to help them reduce their smoking. If participants selected and entered reduction-goal treatment, they entered a factorial experiment in which they were randomly assigned to one level of each of four treatment factors: nicotine patch vs. no patch, nicotine gum vs. no gum, behavioral (smoking) reduction counseling vs. no reduction counseling, and motivational interviewing vs. no motivational interviewing. Thus, the current research occurred within the effectiveness context; it recruited from amongst smokers in primary care and tabulated both those choosing a reduction treatment goal, and those choosing a cessation goal. This approach contrasts with much of the prior efficacy research on Motivation phase or reduction-goal treatment, which focused only on smokers volunteering for reduction-goal treatment.¹¹ Such research does not allow one to determine the proportion of the smoker population that chooses entry into each type of smoking treatment. The present study, on the other hand, allows us to examine the extent to which the availability of reduction-goal treatment may have increased the proportion of smokers who entered evidence-based treatment, as well as whether this treatment option attracted different types of smokers than did cessation treatment.

The Cook et al.³ report showed that both smoking reduction counseling and nicotine gum use tended to produce positive effects on smoking reduction and ultimately, cessation. The present research uses data from the Cook et al.,³ experiment to address the question of whether the availability of a reduction-goal treatment attracted different types of smokers than did cessation treatment. If it did so, then offering such treatment should be an effective strategy for engaging and treating a broader range of smokers who would be underserved if only cessation treatment were available.

METHODS

Procedure

This is a secondary data analysis of smokers who participated in three factorial screening experiments that assessed the effectiveness of intervention components aimed at either smoking reduction or cessation goals.^{3,12,13} Participants (N=1579; 58% women, 88% White)¹ were recruited from June, 2010 through October, 2013 during regular primary care clinic visits at 11 primary care clinics located in southern Wisconsin, U.S., with clinics from two different healthcare systems. Smokers who were identified via a pre-existing EHR tobacco assessment were invited by medical assistants to participate in a research program to help them either quit or reduce their smoking. Interested patients were electronically referred to the research office.

Upon initial phone contact with a referred smoker, study assignment to either reduction or to cessation treatment was completed by stating, “Our research program has two tracks – one for smokers who are ready to quit in the next month and one for smokers who want to cut down on their smoking. Which track would you be interested in?” (This study included only participants who were simultaneously presented reduction or cessation treatment options [n=1579]. It did not include the initial 120 participants who enrolled in the study and were asked “Would you like to try to quit smoking in the next 30 days”; if these initial participants said no, only then were they offered reduction treatment. Therefore, they were not included in the present analysis sample.) Once potential participants selected and entered either cessation or reduction, they were informed of the treatments and study requirements. Interested candidates were assessed for eligibility. The inclusion criteria were: 18 years old; 5 cigarettes/day for the previous 6 months; no interest in quitting in the next 30 days but willing to cut down (for the reduction treatment only); interested in quitting in the next 30 days (for the cessation treatment only); able to read, write, and speak English; agreeing to complete assessments; planning to remain in the area for at least 6 months; not currently taking bupropion or varenicline; agreeing to use only study smoking medication during the study if reporting current cessation medication use; no medical contraindications to using nicotine replacement therapy; and, for women of childbearing potential, agreeing to use an approved birth control method. Individuals were excluded from the experiment if they did not meet these criteria.

Assessments

After providing informed consent for either cessation or reduction treatment, participants completed baseline assessments. The baseline characteristics analyzed for this study include:

demographics (gender, race, education); self-reported history of being diagnosed with and/or treated for anxiety or depression; alcohol frequency and quantity; smoking history (time since most recent quit attempt, number of serious quit attempts, cigarettes smoked per day, home smoking ban, number of close friends or family who smoke); motivation to quit (“How motivated are you to quit smoking [1–10 scale]”); and tobacco dependence (Fagerström Test of Nicotine Dependence [FTND] ¹⁴; Wisconsin Inventory of Smoking Dependence Motives [WISDM] ¹⁵). The WISDM comprises two broad dimensions: Primary Dependence Motives (PDM; core dependence marked by tolerance, craving) and Secondary Dependence Motives (SDM; smoking for instrumental reasons or when exposed to smoking cues). ¹⁶ In addition, the ratio of the PDM score to the SDM score (PDS/SDM ratio) was used to assess the relative dominance of primary versus secondary dependence motives within smokers. Finally, alcohol use frequency patterns were classified as: frequent (daily to 3 times/week), occasional (2 times/week to 3 times/year), or never/rare (1 time/year or never). Alcohol quantity patterns were classified as: heavy (7–25 drinks per occasion), moderate (3–6 drinks per occasion), or light/none (0–2 drinks per occasion).

Analytic Plan

Analyses were conducted using SPSS. ¹⁷ First, we examined the proportion of smokers who expressed interest during the initial phone contact with study staff in learning more about reduction-goal versus cessation treatment (out of all smokers who were invited to learn about smoking treatment options at a healthcare visit). Next, we used univariate logistic regression analysis to identify variables that were significantly associated with treatment entry (quitting [0] vs. reduction [1]). Multivariable logistic regression analysis was used to identify a best-fitting model predicting treatment selection. Using a classical model building procedure, all univariate predictors with a $p < .25$ were initially included in the model, then non-significant terms were removed from the model via backward elimination and the model was re-fit to determine the best fitting model. ¹⁸

RESULTS

Of those who were asked by clinic staff during a health care clinic visit whether they would like to learn more about smoking treatment options ($n=10,242$), 10.2% ($n=1046$) chose to learn about reduction-goal treatment when they were contacted by study staff, whereas 24.1% ($n=2465$) chose to learn about cessation treatment when contacted by study staff. Of the 1046 interested in reduction-goal treatment, 47% met study inclusion criteria and were ultimately inducted into treatment. Of the 2465 interested in cessation treatment, 44% were ultimately inducted into treatment.

Results from the univariate and multivariable models indicate the extent to which variables predict a differential likelihood of entering the two types of treatment. Results of the univariate regression models showed that the likelihood of selecting and entering the two types of treatment was related to gender and race, with females and Whites being relatively more likely to enter reduction treatment (see Table 1). In addition, relative to those who entered a cessation treatment, those who entered a reduction treatment were more likely to

report more frequent and heavier alcohol consumption and were more likely to endorse previous treatment for depression or having a diagnosis of depression (see Table 1).

Regarding smoking-related predictors in univariate models, those who entered reduction treatment versus those entering cessation treatment, were more likely to report lower motivation to quit, lower PDM, and a lower PDM/SDM ratio (i.e., greater SDM relative to PDM scores). Greater likelihood of entering reduction-goal versus cessation-goal treatment was also associated with fewer lifetime quit attempts and more time since a prior quit attempt. A greater likelihood of entering reduction versus cessation treatment was also related to a greater number of close friends and/or family who smoked and being less likely to report smoking restrictions at home. The final multivariable model revealed that the following variables were significantly associated with individuals being relatively more likely to enter a reduction treatment than a cessation treatment: older age, prior treatment for or diagnosis of anxiety, weaker motivation to quit, lower PDM score, a larger number of close friends/family who smoke, and a longer time since the last quit attempt (see Table 1).

DISCUSSION

Results suggest that offering reduction treatment in addition to cessation treatment in a primary care clinic may have increased the proportion of patients expressing interest in, and entering, smoking treatment. Of those who were asked during a clinic visit if they would like to learn more about smoking treatment options (n=10,242), 10.2% (n=1046) chose to learn about reduction-goal treatment, whereas 24% (n=2465) chose to learn about cessation treatment. Slightly less than half of each group ultimately passed screening and entered their respective treatments. Thus, it is possible that including reduction treatment increased the expression of interest in treatment and treatment entry by as much as 45%. Of course, this effect might be influenced by the manner in which the treatment options were offered. For instance, if a smoking reduction goal were offered only after the offer of cessation treatment, then the percentage of smokers opting for reduction treatment might be lower. Even though the number of smokers interested in reduction treatment constituted only about 10% of all those asked about treatment interest in their clinic visits, typically only 5–10% of smokers will accept an offer to enter cessation treatment.^{5,8,19,20} Moreover, of those smokers who were willing to reduce and were randomized to receive Motivation phase treatment, a meaningful portion (19%) opted to receive cessation treatment after receiving brief Motivation phase treatment.³

Reduction treatment may have not only engaged more smokers in treatment, but may also have engaged a broader range of smokers. The variables that most robustly predicted selection and entry into reduction versus cessation treatment by accounting for significant orthogonal variance in a multivariable model were: older age, history of anxiety, lower quitting motivation, lower primary dependence motives, more close friends and family who smoke, and more time since the most recent quit attempt. Additional variables predicted reduction versus cessation treatment selection in the univariate models but were not retained in the best-fitting model: being female, being White, consuming alcohol more frequently, having made fewer lifetime quit attempts, having fewer smoking restrictions at home, and having a history of depression. Therefore, offering reduction treatment engaged a segment of

the smoking population characterized by an array of social/contextual and smoking factors that 1) indicate a pattern of avoiding quit attempts, and possibly avoiding use of evidence-based cessation treatment, and 2) increase the risk for smoking cessation failure when a cessation attempt is made. This is a group of smokers who, relative to those who chose and entered cessation treatment: are mired in smoking networks/context, are less motivated to quit, have not made a recent quit attempt(> 5 years) or have never made such an attempt, are older, and are more likely to endorse having a history of anxiety.

This is the first study, to our knowledge, to examine characteristics associated with selecting reduction versus cessation treatment among patients presenting for primary care visits. Previous research has also examined predictors of choosing to enter cessation immediately versus delaying cessation treatment, as well as predictors of smokers who called to learn about a reduction study versus callers for a separate cessation study.^{21, 22} Consistent with our findings, these studies showed that those who selected or were interested in immediate cessation treatment were more likely to be younger, non-white, and report more previous quit attempts and lower alcohol consumption.^{21,22} Overall, the current findings add to literature suggesting that the offer of reduction treatment may induce smokers to enter treatment who may have otherwise have delayed treatment.

The relative lack of prior quit attempts amongst smokers entering reduction treatment suggests that they were probably less likely over time to have used evidence-based treatment. Indeed, those who selected and entered reduction treatment had characteristics associated with infrequent use of evidence-based cessation treatment: endorsing a diagnosis of anxiety or depression, frequent alcohol use, and low rates of dependence.^{23–25} Such smokers also had characteristics that increase risk for cessation failure: i.e., fewer prior quit attempts, anxiety, depression, frequent alcohol use, female gender, and close friends and family who smoke.^{26–33}

It is unclear why smokers who entered reduction treatment had a history of relatively infrequent quit attempts. One possibility is that all of their risk factors for cessation (e.g., depression, anxiety, presence of smokers in their social networks) explicitly or implicitly affected their confidence or self-efficacy for quitting. Therefore, reduction treatment may have seemed like a more feasible “fall-back” option, one that might help them prepare for a later quit attempt. Of course, some smokers might select reduction treatment as a harm reduction strategy because they doubt they can ever quit successfully. Regardless of the smoker’s motives for choosing reduction treatment, Motivation phase treatment significantly boosts quit attempts and quitting success in those unwilling to make a quit attempt.^{3,11} Therefore, the current findings demonstrate that offering reduction treatment engages those smokers who are especially in need of it: those who might otherwise not enter cessation treatment and who are unlikely to benefit from it.

It is unclear why smokers low in WISDM Primary Dependence Motives (PDM) would be especially likely to select reduction treatment over cessation treatment. Those low in PDM tend to be relatively light smokers^{16,34} and therefore might have felt less motivated to quit based on health reasons. It may also be that smokers who select a reduction goal struggle with quitting for reasons related to secondary dependence motives. Consistent with this

notion, those who selected and entered reduction treatment were high in secondary dependence motives relative to primary dependence motives (PDM/SDM ratio). This suggests that SDM-related motives (e.g., environmental cues to smoke, smoking in social networks, smoking for instrumental purposes such as affect regulation) might discourage quit attempts, making reduction treatment especially attractive. More research is clearly needed to determine how different dependence dimensions influence treatment choice and quit attempts.

This research has several limitations that should be considered. Although we believe that Motivation phase treatments (see ^{2,16}) might bolster the chances for successful quitting amongst those with risk factors for cessation failure, it is also possible that reduction treatment could exert some negative long-term effects. For instance, if entry into such treatment substitutes for cessation treatment entry, this could ultimately reduce abstinence rates. Moreover, although offering reduction as a treatment option appeared to increase the number of smokers inducted into tobacco treatment, reducers might have selected cessation had it been the only available treatment. However, we believe this is unlikely given that those who selected and entered reduction had characteristics of those who, in general, tend to under-engage in cessation treatment, ^{23–25} and because such smokers reported low rates of prior quit attempts. Additionally, this study was conducted within primary care clinics in southern Wisconsin and may not represent those living outside of the Midwest. Moreover, we were unable to access data for smokers who declined participation in the study (who either did not accept MA referral to research personnel, or who—when called by the research office—decided not to enter either reduction or cessation treatment). Finally, other types of Motivation phase treatments, or a different framing of such treatments (e.g., emphasizing the availability of medications), might have significantly shifted the overall proportion of those selecting reduction versus cessation treatment.³⁵

In summary, offering Motivation phase treatment aimed at smoking reduction may be an effective strategy for increasing the proportion and range of smokers inducted into smoking treatment. By offering reduction treatment as an acceptable and effective alternative to cessation treatment (although abstinence is clearly the optimal outcome), reduction treatment may help engage a segment of the smoking population for whom traditional cessation treatments hold little appeal, and may bolster their chances of success when they do try to quit. Future research is needed to examine whether Motivation phase interventions improve the effectiveness of Cessation-phase treatment, especially for those most at risk for cessation failure.

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Table 1.

Univariate and Multivariable Logistic Regression Models Predicting Entry into Reduction vs. Cessation Treatment

Variable	Cessation [†] (n=1087)	Reduction (n=492)	OR (95%CI)	OR(95% CI)
Age- Mean (SD)	46.04 (12.39)	46.91 (14.31)	1.01 (.99, 1.01)	1.02 (1.01, 1.03)
Gender- n(%)				
Female (n=916) [†]	604 (65.9)	312 (34.1)		
Male (n=656)	478 (72.9)	178 (27.1)	.72 (.58, .90)	
Race- n(%)				
White (n=1382) [†]	934 (67.6)	448 (32.4)		
Non-white (n=172)	134 (77.9)	38 (22.1)	.59 (.41, .86)	
Education- n(%)				
High School or less (n=641) [†]	452 (70.5)	189 (29.5)		
> High School (=931)	630 (67.7)	301 (32.3)	1.14(.92, 1.42)	
Income- n(%)				
<\$25,000 (n=517) [†]	376 (72.2)	141 (27.8)		
\$25,000 (n=1001)	687 (68.6)	314 (31.4)	1.19 (.94, 1.51)	
History of Anxiety- n(%)				
No (n=1258) [†]	880 (70.0)	378 (30.0)		
Yes (n=318)	205 (64.5)	113 (35.5)	1.28 (.99, 1.66)	1.44 (1.02, 2.03)
History of Depression- n(%)				
No (n=1027) [†]	726 (70.7)	301 (29.3)		
Yes (n=549)	359 (65.4)	190 (34.6)	1.28 (1.02, 1.59)	
Alcohol Frequency- n(%)				
No/light use (n=409) [†]	296 (72.4)	113 (27.6)		
Moderate use (n=818)	573 (70.0)	245 (30.0)	1.12 (.86, 1.46)	
Heavy use (n=331)	208 (62.8)	123 (37.2)	1.55 (1.14, 2.11)	
Alcohol Quantity- n(%)				

Variable	Cessation [†] (n=1087)	Reduction (n=492)	OR (95%CI)	OR(95% CI)
No/light use (n=675) [†]	493 (73.0)	182 (27.0)		
Moderate use (n=592)	394 (66.6)	198 (33.4)	1.36 (1.07, 1.72)	
Heavy use (n=137)	100 (73.0)	37 (27.0)	1.00 (.66, 1.52)	
Cigs per day- Mean (SD)	17.82 (7.81)	17.44 (7.73)	.99 (.98, 1.01)	
Quitting Motivation- Mean (SD)	8.79 (1.39)	6.10 (2.27)	.47 (.43, .51)	.48 (.44, .52)
PDM- Mean (SD)	4.97 (1.32)	4.79 (1.26)	.90 (.83, .98)	.87 (.78, .97)
SDM- Mean (SD)	4.23 (1.48)	4.23 (1.35)	.99 (.92, 1.07)	
PDM/SDM ratio – Mean (SD)	1.32 (.66)	1.24 (.55)	1.23 (1.02, 1.49)	
FTND- Mean (SD)	4.81 (2.20)	4.75 (2.05)	.99 (.94, 1.04)	
Num quit attempts- Mean (SD)	4.06 (7.04)	2.65 (2.38)	.89 (.85, .93)	
Num close smokers- Mean (SD)	1.78 (1.05)	2.07 (1.00)	1.32 (1.18, 1.46)	1.23 (1.07, 1.43)
Time since last quit- n(%)				
Within past year (n=436) [†]	339 (77.8)	97 (22.2)		
Within 5 yrs (n=671)	476 (70.9)	195 (29.1)	1.43 (1.08, 1.90)	1.19 (.83, 1.75)
> 5 yrs or never (n=451)	267 (59.2)	184 (40.8)	2.41 (1.80, 3.23)	1.75 (1.94, 2.56)
Smoking restrictions in Home- n(%)				
No (n=657) [†]	422 (64.2)	235 (35.8)		
Yes (n=909)	655 (72.1)	254 (27.9)	.70 (.56, .86)	

Note:

[†] Indicates reference category (coded 0); Final multivariable model represents the final best fitting model; PDM = Primary Dependence Motives; SDM = Secondary Dependence Motives; FTND = Fagerstrom Test for Nicotine Dependence