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Relationship of Autonomy Social Support to Quitting Motivation in Diverse Smokers

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Abstract

Background—Research examining relationships between social support and smoking cessation has paid little attention to non-treatment seeking smokers and not considered the role of autonomy support for fostering quitting motivation. This study examined if autonomy support received from family and friends was associated with quitting motivation and making a quit attempt among diverse smokers with varying levels of quitting motivation. Demographic characteristics associated with autonomy support were explored.

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Clinical trial registration: [ClinicalTrials.gov](https://clinicaltrials.gov) NCT01188018.

Declaration of Interest Statement

Each author states that in submitting this manuscript there is no conflict of interest and that all institutional and corporate affiliations are stated above.

Methods—Participants (N=312) responded to advertisements seeking smokers “not quite ready to quit,” and were primarily Black, low-income, and unemployed. Most (255) enrolled in a clinical trial of smoking cessation induction strategies (treatment sample). An additional 57 not meeting the trial eligibility criteria of low quitting motivation enrolled for baseline assessments only. Participants completed baseline measures of autonomy support received from friends and autonomous quitting motivation. In the treatment sample, quit attempts were assessed at 6-months follow-up.

Results—Females reported higher levels than males of autonomy support from friends ($p=0.003$). Participants with a high school diploma/GED reported higher levels of support from family ($p<0.001$) and friends ($p=0.014$) than those with less education or a college/graduate degree. Both family ($p=0.007$) and friend ($p=0.004$) autonomy support scores were significantly, albeit weakly, associated with autonomous quitting motivation. Autonomy support was not associated with making a quit attempt.

Conclusions—Support from family and friends may promote autonomous reasons to quit among diverse smokers. Research is needed to assess the role of social support in the pre-quitting phases among racial and socio-economically diverse populations.

Keywords

social networks; smoking cessation; smoking; nicotine dependence; self-determination theory; intervention

Introduction

Recent findings suggest the potential of family and other social network members to assist individuals with initiating lifestyle behavioral changes (Matire & Franks, 2014; Murray, Craigs, Hill, Honey, & House, 2012). Several decades of research has examined the role of social support in smoking cessation. From observational studies, supportive interpersonal relationships (Fiore et al., 2008) and social networks (Christakis & Fowler, 2008) are correlated with quitting success. However, a key challenge for the field is where and how to leverage social support in the cessation process (Cobb, Graham, Byron, Niaura, & Abrams, 2011; Westmaas, Bontemps-Jones, & Bauer, 2010).

A number of studies have examined how social support can provide instrumental help in quitting. Approaches in which family members or friends (i.e., support persons) are involved in cessation treatment programs with smokers (Park, Tudiver, & Campbell, 2012; Westmaas et al., 2010) or support people are trained as lay cessation counselors (Patten et al., 2004; Patten et al., 2009) have not been uniformly effective. However, recent work suggests that social network members can influence smokers to utilize evidence-based treatments such as quitlines (Muramoto, Wassum, Connolly, Matthews, & Floden, 2010; McAfee, Davis, Alexander, Pechacek, & Bunnell, 2013; Patten et al., 2011).

Most smokers, however, are not ready to quit (Burris, Wahlquist, & Carpenter, 2013), and few studies examined the relationship between social support and motivation to quit. A phase-based framework of cessation partitions the process into four discrete phases: motivation, pre-cessation, cessation, and maintenance (Baker et al., 2011). Most research has

focused on cessation-harnessing support to help smokers who are already in treatment programs and have high baseline levels of quitting readiness (Cohen & Lichtenstein, 1990; Park et al., 2012; Westmaas et al., 2010). Two studies enrolling community samples of smokers found that social support for quitting was associated with increased stage of change, a conventional measure of quitting motivation (Rayens, Hahn, & Hedgecock, 2008; Sorensen, Emmons, Stoddard, Linnan, & Avrunin, 2002). Further, a population-based survey study (Burris et al., 2013) observed that social support was greater among smokers who want to quit now than those not ready to quit immediately. This research suggests that social support may operate differently by phase of the cessation process.

Concepts from self-determination theory (SDT) might aid in pinpointing the relationship between support and motivation. Westmaas et al. (2010) argued for better differentiation of theoretical concepts to adequately test the value of social support relationships in improving a smoker's likelihood of quitting. SDT offers a conceptual framework of interpersonal support and the motivation for health-related behavior change in which autonomy is the central focus (Patrick & Williams, 2012; Ryan & Deci, 2000; Williams et al., 2011). Autonomy is a *motivational quality* related to the extent to which a behavior or course of action is personally endorsed and engaged. It requires a sense of choice and volition as opposed to being associated with a need to comply or with feeling pressured (Patrick & Williams, 2012; Ryan & Deci, 2000). SDT considers the characteristics of how support is provided and specifically the extent to which significant others in the smoker's social context are autonomy supportive. Autonomy support is provided by acknowledging an individual's feelings and unique perspective, by using neutral language and refraining from excessive control and pressure, by providing choices and options, and by providing informational positive feedback (Ryan & Deci, 2000; Williams et al., 2011). Prior research examined autonomy support received by smokers from health care providers in the cessation process (Williams & Deci, 2001; Williams et al., 2006a), but less is known about the role of such support from family members and friends (Williams et al., 2006b)

Few studies examining the role of social support in the cessation process have incorporated diverse samples in terms of socio-economic status and race/ethnicity and thus have not benefited from examining potential racial/ethnic differences (Oh et al., 2015; Pietromonaco, Uchino, & Dunkel Schetter, 2013). In addition, research has revealed some gender differences in the social support process for health behavior change that calls for a more focused understanding of gender roles as they operate in relationships to influence health (Pietromonaco et al., 2013). Gender differences in perceived autonomy support for quitting smoking as well as other demographic factors have not been explored (Westmaas et al., 2010).

The current study utilized data from a randomized clinical trial (Catley et al., 2012) examining the efficacy of Motivational Interviewing for inducing quit attempts and cessation among unmotivated smokers. Data from the 255 participants meeting eligibility criteria and enrolled in the clinical trial were used in this study. Data from an additional 57 participants who did not meet the motivation eligibility criteria but were enrolled for baseline data collection only as part of a sub-study were also used. The purpose of the current report was to examine if autonomy support received from family and friends was associated with

quitting motivation and, in the treatment sample, making a quit attempt. It was hypothesized that greater autonomy support would be associated with greater quitting motivation and a greater likelihood of a quit attempt. Demographic characteristics associated with autonomy support were also explored.

Methods

Participants

From November 2010 to November 2011, smokers were recruited for a smoking cessation induction intervention trial (Catley et al., 2012) through advertisements that targeted “smokers” or “smokers not quite ready to quit” in a large Midwestern city. The trial was approved by the university Institutional Review Board and registered with ClinicalTrials.gov: NCT01188018. Smokers were pre-screened by phone and then re-screened in person for final eligibility at a baseline visit. Potential participants were told that although their smoking habits would be discussed during the study they would not be required to quit. Eligibility criteria included: (1) 18 years, (2) English speaking, (3) currently smoking 1 cigarette per day confirmed by expired-air carbon monoxide 7 ppm (introduced after the first 24 participants to verify smoking status as many individuals who did not smoke expressed interested in participating), (4) having a mailing address and telephone number, (5) willing to participate in all study components and no plans to move from the metropolitan area in the next six months, (6) not currently pregnant nor intentions to become pregnant in the next six months, (7) no current use of cessation medication, (8) no plans to quit smoking in the next seven days, and (9) unmotivated to quit smoking (6 on a single item, 0-10 scale of motivation to quit used at screening “How motivated are you to quit smoking?” with 0=not at all and 10=extremely; Herzog & Blagg, 2007; Miller & Rollnick, 2012). The motivation criteria were designed to ensure participants were suitable for a motivational intervention and the motivational cut-point is consistent with meta-analytic evidence of greater efficacy of MI (Hettinger & Hendricks, 2010). A total of 255 were enrolled into the treatment study. An additional 57 participants were not eligible for the treatment study but were invited to participate in a sub-study. These individuals were not eligible because they were too motivated to quit (i.e., > 6 on a 0-10 scale of motivation to quit) at either the pre-screening or the final eligibility re-screen.

Analyses for the current report used data from the treatment sample (N=255), and the baseline sample (N=312) comprising both the treatment and sub-study participants.

Procedures

In the treatment study, after completing a baseline interview by computer, participants were randomly assigned to one of three types of smoking cessation induction therapies (Motivational Interviewing [MI], Health Education [HE], or Brief Advice [BA]) with an imbalanced allocation (2:2:1). Participants then received an in-person intervention session based on group assignment. Those in the MI and HE groups received an additional in-person session at week 12 and phone sessions at week 6 and week 18. Scheduling was altered if a person set a quit date so as to provide treatment sessions near the selected target quit date as suggested by the U.S. Clinical Practice Guideline (Fiore et al., 2008). To meet the standard

of care (Fiore et al., 2008), participants in all three groups who expressed any interest in quitting (immediately or at any point in the future) were offered a self-help guide. Pharmacotherapy (varenicline, nicotine patch, or lozenge) was offered free of charge to those participants who, during counseling, set a quit date within the timeframe of their planned participation in the study. Participants returned at three- and six-months to complete follow-up assessments via computer. Compensation for each study component completed was provided (up to \$120 total for BA and \$150 total for MI & HE).

In the sub-study, participants completed a baseline interview by computer identical to that in the treatment study. Participants received \$30 for completing the assessment. No follow-up assessments were conducted to assess smoking status in the sub-study.

Measures

Baseline measures

Participant characteristics: Socio-demographic details such as gender, race, age, education, employment, and marital status were assessed. In addition, smoking characteristics including time to first cigarette and number of cigarettes smoked per day were documented.

Autonomy support: Perceived support for smoking behavior change was measured using the 12-item Important Other Climate Questionnaire-Smokers (IOCQ-S) (Williams et al., 2006b), previously validated in a study of over 1000 smokers. Based on SDT, the IOCQ-S forms two sub-scales assessing autonomous support received from friends and family members respectively. The overall questionnaire and subscales had very good reliability for the baseline sample in the current study (Cronbach's $\alpha=0.91$, $\alpha=0.86$ and $\alpha=0.90$, respectively). Examples of items are “My friends convey confidence in my ability to make changes regarding my smoking,” and “I feel that my family understands how I see things with respect to my smoking or quitting.” Items are rated on a 1-7 point scale with 1=not at all true:, 4=somewhat true and 7=very true.

Quitting motivation: The Contemplation Ladder was used at baseline, a validated and conventional measure of readiness to quit (Biener & Abrams, 1991). The Ladder operates as an 11-point scale with zero indicating not ready to quit and 10 indicating ready to quit now.

A second measure assessing a unique aspect of quitting motivation was the Autonomous Motivation subscale from the Treatment Self-Regulation Questionnaire (Levesque et al., 2007; Ryan & Connell, 1989). Based on SDT, the Autonomous Motivation subscale is a well-validated measure of the extent of “internalized” motivation to quit. It comprises six items assessing reasons why the respondent would either stop smoking or continue not smoking, e.g., “Because I feel responsibility for my own health,” “Because it is an important choice I really want to make,” and “Because it is consistent with my life goals.” Items are rated on a 1-7 point scale with 1=not at all true,” 4=somewhat true, and 7=very true. Consistent with prior studies (Williams et al., 2006b), internal consistency reliability of the scale was excellent in our baseline sample ($\alpha=0.88$). The score reflects the mean of the six items.

Follow-up measures (treatment study only)—In the treatment study, quit attempts were defined as self-report of any serious attempt to quit smoking for at least 24 hours during the previous three months and was collected at the three- and six-month follow-ups. Cumulative occurrence of any quit attempt for the entire follow-up period was calculated by collapsing across three- and six-month assessments. Additionally, self-report seven-day point-prevalence smoking abstinence was collected at three- and six-months, and verified biochemically at six months using salivary cotinine (Society for Research on Nicotine and Tobacco [SRNT] Subcommittee on Biochemical Verification, 2002).

Statistical Methods

Participant characteristics were summarized using mean (SD), median, and range for continuous variables and frequency, percent for categorical variables. Autonomy support measures were compared across demographics, specifically gender, race, age, education, employment, and marital status, using the two-sample t-test or analysis of variance as appropriate. For these analyses race was coded into two categories as Black or White/other; age was coded into two categories based on median split of the sample (<48 or ≥48); education was coded into three categories of less than high school, high school diploma/GED, and college/graduate degree; employment was coded into two categories as not employed or employed full/part time; and marital status was coded into two categories of married/committed relationship and not married/committed relationship. The association between autonomy support measures and quitting motivation measures was assessed using regression analyses adjusting for demographic characteristics noted above. For these analyses quitting motivation measures were the dependent variables and social support measures were the independent variables. Pearson correlation coefficients were calculated and displayed for these relationships. In all cases, p-values < 0.05 were considered statistically significant.

Results

Participant Characteristics

Demographic and smoking characteristics along with quitting motivation scores are presented in **Table 1** for the baseline and treatment samples. The baseline sample was 43% female and 68% Black, with a mean age of 46 years. Fifty-seven percent were single, 56% had monthly incomes of \$0-1000, and 76% were unemployed. At baseline participants reported low levels of readiness to quit with a mean score of 3.4 (median=4) of a possible 10 on the Contemplation Ladder.

Demographic Differences on Autonomy Support Measures

Table 2 displays the two IOCQ-S subscale scores reflecting autonomy support received from family and friends respectively, by demographic characteristics. Females reported more support received from friends than did males (Friend subscale mean 4.5 vs. 3.9), $p=0.003$. Participants with a high school education degree/GED reported higher levels of autonomy support from family ($p<0.001$) and friends ($p=0.014$), see Table 2.

Relationship of Autonomy Support to Quitting Motivation

Support from friends and family—Table 3 presents the relationships between the autonomy support and quitting motivation measures. At baseline, higher scores on the IOCQ-S Friend subscale were associated with increased readiness to quit on the *Contemplation Ladder* ($r=0.11$; $p=0.046$; after adjusting for demographic variables $r=0.13$; $p=0.024$). Moreover, higher IOCQ-S Friend scores were associated with increased *TRSQ Autonomous Motivation* scores ($r=0.15$; $p=0.008$; adjusted $r=0.16$; $p=0.004$).

No significant association was found for the IOCQ-S Family subscale and *Contemplation Ladder* scores. Higher IOCQ-S Family subscale scores were associated with increased *TRSQ Autonomous Motivation* scores ($r=0.14$; $p=0.015$; adjusted $r=0.15$; $p=0.007$).

Relationship of Autonomy Support to Quit Attempts (Treatment Study Only)

Overall, the proportion of participants in the treatment study who had made a quit attempt by three months was 34.5% and by six months it was 54.1%. After adjusting for treatment condition, no significant associations were found between the IOCQ-S baseline scores and having made a quit attempt. Only 11 participants (4.3%) had biochemically confirmed smoking abstinence at the week 26 assessment, precluding a meaningful analysis for smoking cessation outcomes.

Discussion

The key finding of this study is that autonomy support received from both friends and family members was significantly, albeit weakly, associated with autonomous motivation to quit. In contrast, support from friends - but not family members - was associated with a conventional measure of quitting motivation, the *Contemplation Ladder*. These results suggest that support from family and friends may have a role in encouraging unmotivated smokers to consider quitting by promoting autonomous reasons to quit such as taking responsibility for one's health and recognizing that quitting is consistent with their personal life goals. The findings that women received more autonomy support from friends than did men and that differences by education level were also observed for both friend and family support are also novel as demographic differences in autonomy support for quitting smoking have not been evaluated before.

Unexpectedly, autonomy social support received by participants at baseline did not translate into better treatment outcomes. Social support may not have been potent enough to overcome known barriers to quitting such as poverty and unemployment experienced by this study sample. This finding may also be attributable to the very modest magnitude of the association between autonomy social support and motivation to quit, or other social influences that were not measured in this study.

The present study makes a number of contributions to the literature. Only one prior investigation assessed the role of *autonomy support* from friends and family members but that study focused on smoking abstinence outcomes following a treatment program (Williams et al., 2006b). Most previous studies examining the relationships between social support and smoking cessation reported on samples of primarily Caucasian smokers, with

high levels of readiness to quit, in cessation treatment programs (Fiore et al., 2008; Park et al., 2012; Westmaas et al., 2010). In contrast, our participants were primarily poor, Black, uneducated, and unemployed. Moreover, smokers in our sample were not seeking cessation treatment and had a wide range of motivation.

This study also has a number of limitations. It was not possible to evaluate how autonomy support may have operated over the course of the study as support was only assessed at baseline. Parent study outcomes focused on quit attempts; because few study participants were abstinent at six-month follow-up, we could not assess quitting or cessation-specific support as was done in prior studies (e.g., Partner Interaction Questionnaire [PIQ]) (Cohen & Lichtenstein, 1990; Park et al., 2012). Nevertheless, our measure of social support was appropriate to the phase of the quitting process reflective of study participants at the time of enrollment (Burris et al., 2013).

Additional research examining the role of social support in the pre-quitting phases is warranted. There is much more to be learned about the role of social support among low-income and minority smokers with low motivation to quit. Alternative conceptual frameworks and corresponding measures are needed to understand the processes of how support is provided and received in this population. Future studies could assess the types and quality of relationships of those providing support as well as cultural influences (Ross et al., 2013; Yuan et al., 2012). Of note, further investigation as to why women reported more social support from friends than did men is warranted. Harnessing social support to motivate smokers to quit is a potentially powerful new approach for extending the reach of cessation treatment among underserved populations (McAfee et al., 2013).

Conclusion

In conclusion, there is some evidence that autonomy social support received from both friends and family members is associated with autonomous motivation to quit in diverse smokers. However, the magnitude of the association is not large and other factors likely account for quitting motivation in this population. Moreover, autonomy social support was not related to smoking quit attempts in diverse smokers. Collectively, results point to the need for more research to understand how support operates, as well as alternative conceptual frameworks of social support in the pre-quitting and cessation phases, among diverse samples of smokers with varying levels of readiness to quit.

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Table 1

Participant Characteristics in the Baseline and Treatment Samples

Characteristic	Baseline Sample (N=312)	Treatment Sample (N=255)
Treatment Group		
MI	NA	102 (40.0%)
Health Education	NA	102 (40.0%)
Brief Advice	NA	51 (20.0%)
Gender		
Female	135 (43.3%)	110 (43.1%)
Male	177 (56.7%)	145 (56.9%)
Race		
Black	213 (68.3%)	171 (67.1%)
White/other	99 (31.7%)	84 (32.9%)
Age		
Mean (SD)	45.6 (10.7)	45.3 (10.8)
Range	(18.0-71.0)	(18.0-70.0)
Education		
Less than high school	61 (19.6%)	49 (19.2%)
High school degree/GED	203 (65.1%)	167 (65.5%)
College degree	40 (12.8%)	33 (12.9%)
Graduate degree	8 (2.6%)	6 (2.4%)
Marital Status		
Single	179 (57.4%)	148 (58.0%)
Divorced/widowed/separated	79 (25.3%)	61 (23.9%)
Married/committed relationship	54 (17.3%)	46 (18.0%)
Monthly Income		
\$0-1000	175 (56.1%)	147 (57.6%)
\$1001-2000	59 (18.9%)	48 (18.8%)
\$2001-3000	22 (7.1%)	15 (5.9%)
>\$3000	19 (6.1%)	15 (5.9%)
Don't know/declined to answer	37 (11.9%)	30 (11.8%)
Employment		
Employed full time	35 (11.2%)	24 (9.4%)
Employed part time	40 (12.8%)	32 (12.5%)
Unemployed	237 (76.0%)	199 (78.0%)
Number of Children Living in Household		
0	236 (75.6%)	194 (76.1%)
1	33 (10.6%)	24 (9.4%)
2	26 (8.3%)	23 (9.0%)
3+	17 (5.4%)	14 (5.5%)
CPD Past 7 days		
Mean (SD)	16.5 (9.2)	16.8 (9.5)

Characteristic	Baseline Sample (N=312)	Treatment Sample (N=255)
Median (Range)	15.0 (2.0-55.0)	15.0 (2.0-55.0)
Time to First Cigarette		
Within 5 minutes	153 (49.0%)	128 (50.2%)
6-30 minutes	122 (39.1%)	102 (40.0%)
31-60 minutes	14 (4.5%)	10 (3.9%)
After 60 minutes	23 (7.4%)	15 (5.9%)
Contemplation Ladder Score		
Mean (SD)	3.4 (2.6)	2.9 (2.2)
Median (Range)	4.0 (0.0-10.0)	2.0 (0.0-10.0)
Score 0-3 (low)	155 (49.7%)	143 (56.1%)
Score 4-6 (medium)	126 (40.4%)	105 (41.2%)
Score 7-10 (high)	31 (9.9%)	7 (2.8%)
TSRQ Autonomous Motivation Score		
Mean (SD)	4.2 (1.7)	4.0 (1.7)
Median (Range)	4.3 (1.0-7.0)	4.0 (1.0-7.0)

Note: Percentages do not add to 100 due to rounding.

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Table 2
Autonomy Support Measures in the Baseline Sample by Demographic Characteristics (N=312)

	Important Other Climate Questionnaire-Smokers Subscale Scores		
	Family Support	p value *	Friends Support
Total (N=312)	4.2 (1.7)	--	4.1 (1.6)
Gender			
Male (N=177)	4.2 (1.8)	0.54	3.9 (1.6)
Female (N=135)	4.3 (1.7)		4.5 (1.6)
Race		0.086	0.27
White/Other (N=99)	4.3 (1.7)		4.3 (1.5)
Black (N=213)	4.2 (1.7)		4.1 (1.7)
Age (median split)		0.96	0.14
<48	4.2 (1.7)		4.3 (1.5)
48	4.2 (1.7)		4.0 (1.7)
Education		<0.001	0.014
Less than high school (N=61)	3.9 (1.9)		3.8 (1.6)
High school diploma/GED (N=203)	4.5 (1.7)		4.3 (1.6)
College/graduate degree (N=48)	3.5 (1.5)		3.8 (1.5)
Employment		0.22	0.66
Employed full/part time (N=75)	4.0 (1.5)		4.1 (1.5)
Not employed (N=237)	4.3 (1.8)		4.2 (1.6)
Marital status		0.79	0.76
Married/committed relationship (N=54)	4.2 (1.6)		4.1 (1.5)
Not married/committed relationship (N=258)	4.2 (1.8)		4.2 (1.6)

Note: Data are presented as mean (SD)

* The two-sample t-test or analysis of variance was used as appropriate to assess the association of the demographic characteristic with the autonomy support measure.

Table 3
Relationships between Autonomy Support and Quitting Motivation in the Baseline Sample (N=312)

Important Other Climate Questionnaire-Smokers Subscale Scores	Quitting Motivation Measures					
	Contemplation Ladder			TRSQ Autonomous Motivation		
	Correlation *	p value	Partial Correlation [†]	Correlation *	p value	Partial Correlation [†]
Family Support	0.05	0.34	0.07	0.14	0.015	0.15
Friends Support from Friends	0.11	0.046	0.13	0.15	0.008	0.16
						p value
						0.007
						0.004

* Pearson correlation coefficient.

[†] Adjusted for gender, race, age, education, employment, and marital status.