

BRIEF REPORT

BELIEFS ABOUT CONTROL OF SMOKING AND SMOKING BEHAVIOR: A COMPARISON OF DIFFERENT MEASURES IN DIFFERENT GROUPS

JOHN P. KIRSCHT, NANCY K. JANZ, and MARSHALL H. BECKER

School of Public Health, University of Michigan

STEPHEN A. ERAKER

Veterans Administration, Ann Arbor, Michigan

JOHN E. BILLI and JAMES O. WOOLLISCROFT

Medical School, University of Michigan

Abstract — This study investigated several measures of beliefs about controlling smoking as predictors of cessation and reduction at one and six months after a medically-based control program. Smokers ($n = 250$ total) attending general medicine clinics at University and Veterans Administration facilities received advice to quit from both physicians and nurses. Beliefs about difficulty resisting urges to smoke in 15 situations, their frequency of occurrence, and general level of difficulty were assessed at baseline. For the University group of patients, significant relationships were found between both general and specific indexes and both cessation and reduction at one month. Although a greater change in smoking was seen at six months, few belief measures remained predictive. At one month, global measures were as useful as specific ones, although difficulty in situations of negative emotion was a consistent and strong predictor. Marked differences between the two sites were found; virtually no measure of difficulty proved predictive for the VA group.

The construct of self-efficacy is currently in wide use to help explain degree of success in changing behaviors, particularly in difficult or challenging situations (Bandura, 1982). While originally formulated with reference to acquiring new behaviors, the concept is also applied to control of undesirable actions. One such area is smoking cessation (Condiotte & Lichtenstein, 1981), where efficacy refers to beliefs about the ability to resist urges to smoke. In research on cessation programs, end of treatment efficacy beliefs have proved predictive of subsequent smoking (Condiotte & Lichtenstein, 1981; McIntyre, Lichtenstein, & Mermelstein, 1983; Supnick & Colletti, 1984). DiClemente (1981) reported that efficacy expectations, measured among "recent" quitters, predicted ability to maintain cessation.

While work has progressed with the assessment of self-efficacy-like beliefs as predictors, a number of issues require further exploration, including how the beliefs are measured, the dimensionality of the concept, and the external validity of relationships to outcomes. The present study aimed at: (1) An evaluation of measures of resisting urges to smoke, from simple to complex; (2) Assessment of the usefulness of distinguishing classes of situations; and (3) Examination of efficacy-related beliefs in different groups of smokers, including those that are more typical of adult smokers generally. The last aim addresses the generalizability issue and the utility of the concept of efficacy for different people.

Funding for this research came from Grant HL 30566, Division of Lung Disease, NHLBI.

Dr. Eraker is now at the VAMC, Salt Lake City.

Requests for reprints should be sent to John P. Kirsch, School of Public Health, University of Michigan, Ann Arbor 48109

Study design and procedures

The study was conducted in ambulatory general medicine clinics at the University of Michigan (UM) and at the Ann Arbor Veterans Administration Medical Center (VA). Physicians and nurses counselled smokers who appeared for medical care during specified clinic days. The major theme was to stop smoking. Half of the patients, randomly selected, also received a printed quit smoking manual (revised after Strecher, 1983). Within a few days of the clinic visit, each participant was interviewed by telephone; all were smoking at this baseline interview. About one month later, and again at six months, a follow-up interview was done by phone. Data collection was strictly separated from the clinics and the receipt of medical care. Fifteen specific items related to efficacy were included in the interview. In large part, these were the same situations as those of Conditte and Lichtenstein (1981). Using a four-step response scale, respondents were asked to rate how frequently the situations occurred and how difficult it would be to resist the urge to smoke. In addition, there was a single question referring to the overall difficulty in quitting smoking, with a seven-point response scale. Smoking was assessed in terms of amount usually smoked per day and the number of cigarettes the previous day.

Participants and measures

A total of 250 smokers went through the intervention and the initial interview. Of these, 144 attended the University clinics and 106 the VA. Overall, this group of smokers averaged 24 cigarettes per day and had smoked for 32 years. The two sites, however, serve distinctly different groups. On the average, the VA patients are older, less educated, in poorer health, and have smoked longer. Nearly all are male. At the University clinics, the outpatient group includes some University employees, but also a wide range of county residents who use the facility for primary care. At the one-month follow-up, 94% of the original group was interviewed: 96% at UM and 92% at the VA. Only five refused to participate at that time, while nine others were lost to follow-up. After six months, the overall participation rate was 84%; most losses were failures to locate the person.

A factor analysis of the "difficulty" items yielded three factors, accounting for 54.6% of the common variance: factor 1, negative emotions, on which difficulty with not smoking when depressed had the highest loading; factor 2, social situations, with the highest loading on "seeing others smoking", and factor 3, positive situations, on which difficulty "when feeling good" loaded highest. A mean difficulty index was also created by averaging responses to the 15 items. In addition, the frequency and difficulty ratings for the negative emotional states and for social situations were multiplied together to represent an "expected difficulty" measure. Internal consistencies of the indexes ranged from .85 to .90, except for Factor 3 (.69). With respect to smoking, a measure of change was constructed as the ratio of number of cigarettes at follow-up to number at baseline times 100.

Beliefs and outcomes

At one month follow-up, 8.5% of the 236 active participants, were not smoking; by six months, 18.2% were abstinent. Reduction in number of cigarettes smoked per day was 18% at one month and 29% at six months. Cessation, represented as a dummy variable, and change in number of cigarettes were first correlated with the difficulty indexes, then multiple regressions assessed combinations of indexes as predictors. For the entire group, all of the indexes were related to cessation at one month and

Table 1. Correlations among difficulty measures and smoking at one month, separately for entire group and University subgroup.

Measures	A	B	C	D	E	F	G	H
A. 1-Item Difficulty	x	.41	.36	.24	.43	.30	-.35	.34
B. Mean Difficulty (15 items)	.45	x	.82	.79	.84	.71	-.31	.18
C. Factor 1: Negative Emotion	.38	.84	x	.48	.51	.89	-.33	.22
D. Factor 2: Social Situations	.30	.79	.49	x	.53	.37	-.18	.06*
E. Factor 3: Positive Situations	.46	.85	.54	.57	x	.45	-.29	.20
F. "Expected" Difficulty	.32	.72	.90	.39	.44	x	-.34	.18
G. Smoking Status	-.25	-.26	-.25	-.15	-.25	-.22	x	.54
H. Change in Number of Cigarettes	.23	.13	.15	.07*	.09*	.13	.44	x

Note 1. Product moment correlations (decimal point dropped) for the entire group are shown below the main diagonal; those for the UM group are above the diagonal.

Note 2. *N* varies because of missing data on some items. Average for the entire group = 227; for the UM subgroup, 133.

*Not significant at the .05 level.

several correlated with change in amount smoked (See Table 1). However, the magnitude of the correlations is low.

Combinations of indexes accounted for less than 10% of the variance in cessation and less than five percent of that for change. The overall difficulty index (15 items) plus the one item measure yielded the best prediction of cessation (9.4% of the variance). Note, however, in Table 1, that the single item itself correlated $-.26$ with cessation. The three difficulty factors taken together accounted for eight percent of the variance in cessation. Combinations of difficulty measures did only about half as well with respect to variance in the change measure.

Differences between the two sites in the belief-behavior relationships were quite marked. Although not significant, more people quit smoking at UM (vs. VA) at both one and six months. Response to the various belief items, however, at the two sites, the patterns of correlation among items and clustering of the items were remarkably alike. Yet, much stronger relationships between the difficulty measures and outcomes at one month were found for the UM participants. Table 1 also portrays the correlations for the UM group. Difficulty in negative emotional states was the best predictor of cessation, accounting for 12.3% of the variance. At the VA, only the index of difficulty in positive situations related significantly to cessation, accounting for 4.8%. With the exception of the index of difficulty in social situations, the same measures correlated with change in smoking at one month for the UM group; no significant relationships occurred at the VA.

For the UM group, combinations of indexes explain from 13% to over 18% of the variance in cessation and from 5 to 11% of change in smoking. The single item plus the "expected" difficulty index represent the best combination. The negative emotion factor is significant for both dependent variables. At the VA, by contrast, none of the regressions yielded significant results.

There were few relationships between the baseline difficulty measures and the six-month outcomes. Neither the single item nor the overall difficulty index yielded significant correlations with cessation. In contrast, for the University patients, the

index of difficulty in positive situations predicts cessation and change in number of cigarettes; the r 's are $-.21$ and $.19$ respectively. Combinations of the difficulty measures do not add any further to the predictions.

Discussion

These results present a mixed picture of efficacy beliefs in relation to efforts at control of cigarette smoking. If we restrict attention to the University group, there are positive findings. Factors into which the overall concept was differentiated are similar to those found by other investigators (Conditte & Lichtenstein, 1981); the apparent importance of situations of negative emotions fits with the literature (Marlatt & Gordon, 1980). Much of the accountable variance in cessation and change, however, was associated with the simple, one-item measure of difficulty—a result suggesting the value of general assessment versus detailed accounting. The smokers studied, particularly at the UM, are more representative of the population of adult smokers; they did not enter the study as volunteers for a cessation program.

Perhaps the most important findings are the site differences. Indexes of difficulty accounted for over ten times as much variance in cessation and change in amount smoked among the UM participants as compared with the VA at the one-month interval. This contrast was not due to the way in which the beliefs are structured. It is true that the measures of cessation and of reduction were more skewed at the VA so that the potentially predictable variance was less. Even so, the differences in relationships appear to be real, and could be due to the levels of motivation to stop smoking, or to the validity of beliefs about resisting urges to smoke. As a group, the VA patients are relatively disadvantaged compared to the University sample. Efficacy-like constructs do presuppose accurate perceptions of, and memory for, events; groups can differ in such capacities. More needs to be known about the applicability of the concepts to different people.

REFERENCES

- Bandura, A. (1982). Self-efficacy mechanisms in human agency. *American Psychologist*, *37*, 122–147.
- Conditte, M., & Lichtenstein, E. (1981). Self-efficacy and relapse in smoking cessation programs. *Journal of Clinical and Consulting Psychology*, *49*, 648–658.
- DiClemente, C. (1981). Self-efficacy and smoking cessation maintenance: A preliminary report. *Cognitive Therapy and Research*, *5*, 175–187.
- Marlatt, G., & Gordon, J. (1980). Determinants of relapse: Implications for the maintenance of behavior change. In P. Davidson & S. Davidson (Eds.), *Behavioral medicine: Changing health lifestyles*. New York: Brunner/Mazel.
- McIntyre, K., Lichtenstein, E., & Mermelstein, R. (1983). Self-efficacy and relapse in smoking cessation: A replication and extension. *Journal of Clinical and Consulting Psychology*, *51*, 632–633.
- Strecher, V. (1983). A minimal contact smoking cessation program in a health care setting. *Public Health Reports*, *98*, 497–502.
- Supnick, J., & Colletti, G. (1984). Relapse coping and problem solving training following treatment for smoking. *Addictive Behaviors*, *9*, 401–404.