Stages of Change in Smokers With Schizophrenia or Schizoaffective Disorder and in the General Population

by Manuela Etter, Sylvia Mohr, Claire Garin, and Jean-François Etter

Abstract

This study compared smoking behavior and motivation to quit smoking, assessed with a “stages of change” questionnaire, in outpatients with schizophrenia or schizoaffective disorder and in a representative sample of the general population. We conducted a mail survey in a representative sample of the general population of Geneva, Switzerland, in 1996 (n = 742); and a survey of 151 patients with schizophrenia (84%) or schizoaffective disorder (16%) who attended a Geneva ambulatory psychiatric clinic in 2000. There were more smokers (70% vs. 28%, p < 0.001) in patients with schizophrenia or schizoaffective disorder than in the general population, and fewer ex-smokers (15% vs. 52%, p < 0.001). Patients with schizophrenia or schizoaffective disorder smoked more than smokers in the general population (22 vs. 16 cigarettes per day, p < 0.001). Among current smokers, the distribution of stages of change was similar in patients with schizophrenia or schizoaffective disorder (precontemplation 79%, contemplation 18%, preparation 3%) and in the general population sample (74%, 22%, and 4%, p = 0.6). In both samples, similar proportions of smokers had made an attempt to quit in the previous year (27% vs. 22%, p = 0.3). These results suggest that a substantial minority of smokers with schizophrenia or schizoaffective disorder are motivated to quit smoking, try to quit, and succeed in quitting.

Keywords: Schizophrenia, schizoaffective disorder, tobacco dependence, nicotine dependence, epidemiologic studies.


Tobacco dependence and its treatment are highly relevant to psychiatrists who treat patients with schizophrenia, for several reasons. First, smoking prevalence is much higher in patients with schizophrenia (58% to 92%) than in the general population (25% to 37%) (Hughes et al. 1986; Corrao et al. 2000; Herrán et al. 2000; Kelly and McCreadie 2000). Smoking prevalence and level of tobacco dependence are also higher in patients with schizophrenia than in patients with other psychiatric disorders (Hughes et al. 1986; Dalack et al. 1998; Diwan et al. 1998; Lasser et al. 2000). As a consequence, smoking-related morbidity and mortality are particularly high in patients with schizophrenia (Allebeck 1989; Brown et al. 2000).

Furthermore, smoking modifies the therapeutic effect of several psychoactive drugs (Hughes et al. 1986). In particular, smoking offsets the sedative effects of neuroleptics and may decrease blood levels of antipsychotic drugs (Hughes et al. 1986; Lohr and Flynn 1992; Hughes et al. 1996; Addington 1998). As a result, smokers with schizophrenia may require higher dosages of neuroleptics (Goff et al. 1992; Lohr and Flynn 1992). Finally, the cost of cigarettes places a high demand on the already difficult economic situation of most patients with schizophrenia.

Nevertheless, many psychiatrists have not been interested in treating tobacco dependence in these patients. Smoking is often considered acceptable for patients with schizophrenia, who are seldom encouraged to quit smoking or supported in their efforts to quit (Addington 1998). The lack of treatment for tobacco dependence in patients with schizophrenia may stem from assumptions that interventions will be ineffective in this group, that quitting smoking will worsen psychiatric symptoms, or that these patients do not want to quit smoking.

These assumptions are largely untested. Few tobacco dependence treatments have been evaluated for their effectiveness in patients with schizophrenia, but research shows that these treatments can be effective even though their effect may be modest (Ziedonis and George 1997; Addington et al. 1998; George et al. 2000b). Positive and negative symptoms of schizophrenia are not increased after smoking cessation (Ziedonis and George 1997 [24

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patients]; Addington et al. 1998 [50 patients]; Dalack et al. 1999 [19 patients]; George et al. 2000b [45 patients]), or after smoking reduction following a treatment of bupropion (Evins et al. 2001 [18 patients]; Weiner et al. 2001 [8 patients]). Finally, substantial proportions of patients with schizophrenia are motivated to quit smoking (Goldberg et al. 1996; Addington et al. 1997; Kelly and McCreadie 1999).

The concept of "stage of change" is widely used in smoking cessation research and interventions (Prochaska et al. 1992), in particular to match counseling to the characteristics of smokers, including smokers with schizophrenia (Addington et al. 1997, 1999). However, we know of no study that compares directly the distribution of smokers by stage of change in patients with schizophrenia and in the general population.

The aim of the present study was to compare smoking behavior and the distribution of stages of change in a representative sample of the general population and in a sample of patients with schizophrenia or schizoaffective disorder attending an ambulatory psychiatric clinic.

Methods

Participants and Data Collection

General population sample. Using a list of random numbers generated by a computer, we drew a representative (random) sample of 1,000 people aged 18 to 70 years from the accessible part of the registry of residents of Geneva, Switzerland, in 1996. These people received by mail a questionnaire on smoking, and we sent up to four reminder mailings to nonrespondents (Etter et al. 1997).

Sample of patients. During 2 months (May and June 2000), all patients attending a regular appointment at a public sector ambulatory clinic for psychoactive disorders were asked to answer a questionnaire. All patients fulfilled ICD–10 and DSM–III–R criteria for schizophrenia or schizoaffective disorder. The diagnosis was made by a psychiatrist, based on definitions of these diseases in ICD–10 and DSM–III–R, but without using a structured clinical interview. Questionnaires were self-administered, but when necessary (in one-third of patients), completion was supervised by a psychiatrist or another caregiver.

Questionnaire. We used the same questions in both samples. The questionnaire covered age and sex, years of education, smoking status, age at initiation of daily smoking, number of years as a smoker, average number of cigarettes smoked per day, minutes to the first cigarette in the morning, and number of quit attempts in the previous year. Ever-smokers included people who had ever smoked one or more cigarettes per day during at least a 6-month period (WHO 1996).

Confidence in the ability to quit smoking or self-efficacy (Bandura 1977) was assessed with a single question: "If you decided to quit smoking, are you sure that you could quit?" Four response options followed, ranging from "Absolutely sure" to "Not at all sure."

To assess stage of change, we used a questionnaire developed by the authors of this concept (DiClemente et al. 1991; Prochaska et al. 1992). This questionnaire was transmitted to us by these researchers (appendix). We used a rigorous process to translate it into French, and we published validation data on this translated version of the questionnaire (Etter et al. 1997; Etter and Perneger 1999). This questionnaire classifies ever-smokers into five stages of change: precontemplation (smokers not thinking about quitting smoking in the next 6 months), contemplation (smokers seriously thinking about quitting in the next 6 months), preparation (smokers planning to quit in the next 30 days and having tried to quit smoking in the past year), action (ex-smokers who quit smoking less than 6 months ago), and maintenance (ex-smokers who quit more than 6 months ago) (DiClemente et al. 1991; Prochaska et al. 1992).

Tobacco dependence was assessed by the number of cigarettes smoked per day and the number of minutes between waking up and smoking the first cigarette in the morning. We also computed the Heaviness of Smoking Index, which combines these two variables and rates tobacco dependence on a 0 to 6 scale, from 0 = not dependent to 6 = extremely dependent (Heatherton et al. 1989).

We used the CAGE questionnaire to assess alcohol abuse (Ewing 1984). We compared the age and sex distributions in our sample of the general population and in the population aged 18 to 70 in the official registry of Geneva residents (OCSTAT 2000).

Statistical Analyses. We used t tests to compare variables at a scale level of measurement and chi-square tests to compare categorical variables. We used multivariate linear and logistic regression models to identify variables that were independently associated with study group (patients with schizophrenia vs. general population).

Results

Participation. Of 1,000 people in the general population sample who were invited to participate, 742 (74%) returned the survey. The age and sex distributions were similar in people who returned the questionnaire and in the population aged 18 to 70 in the official registry of Geneva residents (chi-square = 4.7, p = 0.8). Both our sample and the population aged 18 to 70 in the official registry were 48 percent men.

Among the 253 patients with schizophrenia or schizoaffective disorder registered at the clinic, 92 (36%)
either had no appointment during the study period or dropped out of treatment, 161 (64%) visited the clinic during the study period, and 151 (94% of 161, 60% of 253) answered the questionnaire. Participants were more often diagnosed with schizophrenia (84%) than with schizoaffective disorder (16%).

Comparison of the Two Samples. Compared to participants in the general population, patients with schizophrenia or schizoaffective disorder were more likely to be men, were 6 years younger, had received 1.2 fewer years of education, and were more likely to be ever- or current smokers (table 1).

<table>
<thead>
<tr>
<th>Table 1. Comparison of a representative sample of the general population and of a sample of outpatients with schizophrenia, Geneva, Switzerland, 1996 and 2000</th>
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<td>Number of participants</td>
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<td>Years of education (range)</td>
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<td>Ever-smokers, %</td>
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<td>Age at initiation of daily smoking</td>
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<td>Stages of change</td>
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<td>If you decided to quit smoking, are you sure that you could quit?</td>
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<td>Fairly sure, %</td>
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<td>Not sure, %</td>
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<td>Not at all sure, %</td>
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<td>Cigarettes per day (range)</td>
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<td>Smoke first cigarette of the day within 5 minutes of waking up,</td>
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<td>Minutes to first cigarette of the day</td>
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<td>Heaviness of Smoking Index (0–6 score)</td>
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<td>Made a quit attempt in past year, %</td>
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<td>Number of years smoking</td>
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<td>Among ex-smokers</td>
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<td>Age at smoking cessation</td>
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Among ever-smokers, the proportion of ex-smokers was higher in the general population sample than among patients (odds ratio = 6.0, 95% confidence interval = 3.5–10.2). Among current smokers, the distribution of stages of change was similar in patients with schizophrenia or schizoaffective disorder (precontemplation 79%, contemplation 18%, preparation 3%) and in the general population sample (74%, 22%, and 4%, respectively, \( p = 0.6 \)). The proportion of current smokers who had made a quit attempt in the previous year was also similar in the two groups (table 1).

Smokers with schizophrenia or schizoaffective disorder were more dependent on tobacco than smokers in the general population. They smoked 6 cigarettes more per day, smoked their first cigarette of the day 30 minutes earlier, and scored 1.5 points higher on the Heaviness of Smoking Index. Compared to smokers in the general population, smokers with schizophrenia or schizoaffective disorder were less confident in their ability to quit smoking.

The age at initiation of daily smoking (among ever-smokers) and the number of years as a smoker (among current smokers) were similar in the two groups. Among ex-smokers, the age at smoking cessation was similar in the two groups.

**Multivariate Analyses.** In all participants, the odds of being an ever-smoker remained higher in patients with schizophrenia or schizoaffective disorder than in the general population, after adjustment for age, sex, and years of education (odds ratio = 3.7, 95% confidence interval = 2.3–6.0) and after further adjustment for alcohol abuse assessed with the CAGE score (odds ratio = 3.8, 95% confidence interval = 2.3–6.4).

In ever-smokers, the odds of being an ex-smoker remained higher in the general population sample than in patients with schizophrenia or schizoaffective disorder, after adjustment for age, sex, years of education, and age at smoking initiation (odds ratio = 4.3, 95% confidence interval = 2.4–7.8) and after further adjustment for CAGE score (odds ratio = 4.2, 95% confidence interval = 2.3–7.7).

In current smokers, the between-group difference in the heaviness of smoking index remained unchanged after adjustment for age, sex, years of education, and age at smoking initiation (difference = 1.43 points on the Heaviness of Smoking Index, 95% confidence interval = 1.01–1.84) and after further adjustment for CAGE score (difference = 1.37 point, 95% confidence interval = 0.94–1.80).

In current smokers, the between-group difference in self-efficacy (i.e., confidence in ability to quit smoking) was no longer statistically significant after adjustment for the level of tobacco dependence (assessed with the Heaviness of Smoking Index).

**Discussion**

The most original findings of this study were that the level of motivation to quit smoking and the frequency of recent quit attempts were similar in smokers with schizophrenia or schizoaffective disorder and in smokers in the general population. These results were unexpected and challenge the common view that these patients are not motivated to quit smoking and do not try to quit.

Approximately one of four smokers with schizophrenia or schizoaffective disorder reported having tried to quit smoking during the past year, the same proportion as in the general population. Because no tobacco dependence treatments specifically designed for smokers with schizophrenia are available in most psychiatric units, many of these patients are currently left unaided during nicotine withdrawal. There is a clear need to provide more support to these patients.

This is one of few studies assessing stages of change in smokers with schizophrenia and the only one that provides a direct comparison with the general population, using the same questionnaire. The level of motivation to quit was similar in patients with schizophrenia and in the general population, which is encouraging given the high levels of smoking prevalence and tobacco dependence in these patients.

The distribution of smokers by stage of change was less favorable in this study than in a study of a convenience sample of smokers with schizophrenia (precontemplation 58%, contemplation 30%, preparation 12%) (Addington et al. 1997). This difference may reflect the less favorable distribution of stages of change in smokers in Europe compared to smokers in North America (Etter et al. 1997). Other authors reported that 37 percent of smokers with schizophrenia attending a rehabilitation program were in the precontemplation stage of change (Goldberg et al. 1996), the same proportion as in the U.S. population (Etter et al. 1997), but these authors did not report the proportion of patients in the other stages. In a rural area in Scotland, a substantial minority of smokers with schizophrenia (33%) reported that they wanted to give up smoking, which was less than in the general population of the same area (60%) (Kelly and McCreadie 1999). Previous research shows that the distributions of stages of change in outpatients with schizophrenia who use alcohol, marijuana, and cocaine were quite similar to the stage distribution of smokers with schizophrenia or schizoaffective disorder in the present study, with 16 to 19 percent of users in the contemplation and preparation stages of change for these substances (Ziedonis and...
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Trudeau 1997). Taken together, these studies suggest that substantial proportions of patients with schizophrenia are motivated to stop smoking or using illicit substances.

Smoking Cessation. Among participants with schizophrenia or schizoaffective disorder, one in six ever-smokers had quit smoking. This quit rate is similar to the rate observed in other samples of patients with schizophrenia (Addington 1998; Kelly and McCreadie 1999). Thus, quitting smoking should not be considered impossible for these patients, even though it may be more difficult for them than for mentally healthy smokers.

The same proportion of smokers in both samples reported having made a quit attempt in the previous year, but there were fewer ex-smokers among patients with schizophrenia or schizoaffective disorder than in the general population. This may reflect higher relapse rates after quit attempts in these patients. Their greater difficulty in quitting smoking is also reflected by their higher level of tobacco dependence and their lower confidence in their ability to quit smoking (self-efficacy).

There are several reasons why smoking prevalence, severity of tobacco dependence, and the likelihood of success of quit attempts are worse in patients with schizophrenia than in patients with other mental diseases and in mentally healthy smokers. First, patients with schizophrenia may use nicotine as a self-medication for the illness. The dopaminergic reward system is involved both in nicotine dependence and in the pathophysiology of schizophrenia (Dalack et al. 1998). Nicotine's ability to augment dopamine release could be particularly appealing to patients in whom the dopaminergic system is defective (Glassman 1993). The self-medication hypothesis is supported by research showing that smoking can transiently reverse the deficit in the processing of auditory stimuli that is found in patients with schizophrenia (Adler et al. 1993) and by research suggesting that cigarette smoking has a beneficial effect on visuospatial working memory in smokers with schizophrenia (George et al. 2002).

Patients with schizophrenia may also smoke to offset the side effects of antipsychotic drugs, as suggested by research showing that a nicotine patch attenuates the adverse side effects of these drugs (Levin et al. 1996) and that cigarette smoking reduces neuroleptic-induced parkinsonism (Decina et al. 1990).

A second hypothesis is that some antipsychotic drugs may increase smoking, as suggested by research showing that haloperidol caused a dose-related increase in ad lib smoking in patients with schizophrenia, in comparison with their baseline level when they were taking no antipsychotic medications (McEvoy et al. 1995a). On the other hand, atypical antipsychotic drugs, in particular clozapine, may decrease smoking (George et al. 1995; McEvoy et al. 1995a), and smoking cessation rates are doubled in patients with schizophrenia who use atypical antipsychotic drugs in combination with a nicotine transdermal patch, compared to those using a nicotine patch and typical antipsychotic drugs (George et al. 2000b).

A third hypothesis is that genetic factors explain the co-occurrence of smoking and schizophrenia (De Leon 1996), as suggested by research showing that nicotinic receptors are abnormally expressed (Freedman et al. 1995; Leonard et al. 2000; Stassen et al. 2000) and function abnormally in people with schizophrenia (Griffith et al. 1998).

Finally, the high smoking prevalence in psychiatric units creates an environment where some nonsmoking patients may start to smoke or may relapse to smoking. In addition, a lack of encouragement and a lack of tobacco dependence treatments specifically designed for patients with schizophrenia make it harder for these patients to quit smoking.

Research suggests that positive and negative symptoms of schizophrenia are not increased after smoking cessation in patients receiving nicotine patches (Ziedonis and George 1997; Addington et al. 1998; Dalack et al. 1999; George et al. 2000b) or placebo patches (Dalack et al. 1999); after smoking reduction following a treatment of bupropion (Evins et al. 2001; Weiner et al. 2001); or after smoking reduction following a treatment of nicotine patches (Dalack and Meador-Woodruff 1999). Thus, exacerbation of psychiatric symptoms probably does not explain the difficulty that smokers with schizophrenia have with quitting smoking, and smoking cessation is probably safe in these patients, in particular if nicotine replacement or bupropion is used.

Strengths and Limitations of This Study. One in four potential participants in our survey of the general population did not return the questionnaire. This raises the question of the representativeness of this sample. However, the age and sex distributions were similar in the general population sample and in the official registry of Geneva residents. In addition, the average age at smoking initiation was similar in our study (18 years), in a large population-based survey conducted in Switzerland (OF5 2000), and in women surveyed in Geneva (Morabia et al. 2002). Thus, the distributions of age, sex, and age at smoking initiation do not appear to be biased in our sample of the general population. It is difficult to speculate on the existence, size, and direction of any potential nonresponse bias for the other variables under study (Etter and Perneger 1997).

In Geneva, almost all patients who are treated for schizophrenia or schizoaffective disorder receive psychiatric care in public sector institutions. We included 94 per-
percent of patients who visited an outpatient clinic during a 2-month period but excluded patients who were registered but did not visit the clinic during this period (92 of 253, 36%). These patients included compliant patients who had no appointment during the study period and noncompliant patients who dropped out of the treatment. In previous research conducted in the same clinic, we showed that 9 percent of patients dropped out of treatment (Fuciec et al. 2000). This small dropout rate should only moderately limit the generalizability of the present study. Compared to compliant patients, dropouts included more men, more users of illicit drugs, and more patients living alone or lacking familial support (Fuciec et al. 2000). Because we know of no published study on the association between compliance with psychiatric treatment and stages of change for smoking, we do not know whether our results are generalizable to patients who dropped out of treatment. We did not include patients with schizophrenia or schizoaffective disorder who received inpatient care, patients treated in private practice clinics, or patients receiving no medical care. Thus, our results may not be generalizable to all patients with schizophrenia or schizoaffective disorder.

Previous studies on motivation to quit smoking in schizophrenia included both patients with schizophrenia and patients with schizoaffective disorder (Goldberg et al. 1996; Addington et al. 1997, 1999), or excluded patients with schizoaffective disorder (Kelly and McCreadie 1999). We included a minority (16%) of patients with schizoaffective disorder, which may limit the possibility of comparing our results with those of one previous study (Kelly 1999).

We used a validated questionnaire developed by the authors of the concept of stage of change. Authors of previous studies did not state whether they used a validated questionnaire to assess stages of change (Goldberg et al. 1996; Addington et al. 1997), but our and their questionnaires were nevertheless based on the same definitions of stages of change (Prochaska et al. 1992). Research shows that using different questionnaires to assess stages of change produces only minor differences in the statistical distributions of stages, as long as these questionnaires are based on the same definition (Etter and Sutton 2002). Thus, differences between questionnaires probably do not explain the differences between this and other studies on stages of change in schizophrenia. Rather, these differences probably reflect differences between Europe and North America in the distributions of stages of change (Etter et al. 1997).

In one study, the level of motivation to quit smoking was lower in patients with schizophrenia than in the general population (Kelly and McCreadie 1999), but we found no such difference. There are several reasons why our results were different from Kelly and McCreadie’s. First, we included only patients who attended an outpatient clinic, whereas they included all known patients with schizophrenia in a rural area in Scotland. Second, in the Kelly and McCreadie study, patients were asked only whether they wanted to give up smoking, which is quite different from an assessment of stage of change. It is possible that the difference between our results and Kelly and McCreadie’s is explained by differences in the methods used to assess motivation to quit. Third, we included patients with schizoaffective disorder, whereas Kelly and McCreadie excluded them. Finally, motivation to quit smoking may be influenced by cultural factors that may vary between a rural area in Scotland and an urban area in Switzerland.

Patients completed the questionnaire at the clinic, often under the supervision of a caregiver, whereas participants in the general population sample completed the questionnaires at home. The method of data collection (mail vs. in-person) may influence responses to health surveys (O’Toole et al. 1986; Van Campen et al. 1998), but we know of no published data on the influence of assessment method (mail vs. in-person) on stage of change for smoking.

In the other studies of motivation to quit smoking in schizophrenia, patients also completed questionnaires under supervision (Goldberg et al. 1996; Addington et al. 1997; Kelly and McCreadie 1999). Supervision of these patients is necessary because of impairments specific to their disease. Negative symptoms, including deficits in abstract thinking and self-consciousness, may compromise the ability of patients with schizophrenia to self-report their level of motivation to change. Previous research found little agreement between assessments of stage of change for drug and alcohol use made by a clinician who used a staging algorithm, and self-reported stage of change assessed with the Socrates scale (Addington et al. 1999). However, these results are difficult to interpret because of the small sample size (39 patients with schizophrenia), because the Socrates scale was not initially designed to classify people in discrete stages and because assessments based on questionnaires that use different definitions of stages may produce very different results (Farkas et al. 1996; Etter and Perneger 1999). Other research showed that the reliability of a measure of readiness to change substance use behavior was similar in patients with schizophrenia and in patients with mood disorders (Carey et al. 2001). Taken together, available data leave many questions unanswered, but they do not provide convincing evidence that assessments of stages of change in patients with schizophrenia may lack validity.
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Appendix. Questionnaire Used To Assess Stages of Change

1. In the past, have you been a regular cigarette smoker (at least one cigarette per day during at least 6 months)? (Yes/No)
2. Have you smoked any cigarettes during the past 6 months? (Yes/No)
3. Do you currently smoke cigarettes? (Yes/No)
4. Are you seriously considering quitting smoking within the next 6 months? (Yes/No)
5. Are you planning to quit smoking in the next 30 days? (Yes/No)
6. In the past year, how many times have you quit smoking for at least 24 hours?