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Original Article

An online survey of tobacco use, intentions to quit, and cessation strategies among people living with bipolar disorder

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Objectives: Tobacco use is prevalent among people living with bipolar disorder. We examined tobacco use, attempts to quit, and tobacco-related attitudes and intentions among 685 individuals with bipolar disorder who smoked ≥ 100 cigarettes in their lifetime.

Methods: Data were collected online through the website of the Depression and Bipolar Support Alliance, a mood disorder peer-support network.

Results: The sample was 67% female, 67% aged 26 to 50, and 89% Caucasian; 87% were current smokers; 92% of current smokers smoked daily, averaging 19 cigarettes/day (SD = 11). The sample began smoking at a mean age of 17 years (SD = 6) and smoked a median of 7 years prior to bipolar disorder diagnosis. Among current smokers, 74% expressed a desire to quit; intent to quit smoking was unrelated to current mental health symptoms [$\chi^2(3) = 5.50$, p = 0.139]. Only 33% were advised to quit smoking by a mental health provider, 48% reported smoking to treat their mental illness, and 96% believed being mentally healthy was important for quitting. Ex-smokers (13% of sample) had not smoked for a median of 2.7 years; 48% quit 'cold turkey.' Most ex-smokers (64%) were in poor or fair mental health when they quit smoking. At the time of the survey, however, more ex-smokers described their mental health as in recovery than current smokers [57% versus 40%; $\chi^2(3) = 11.12$, p = 0.011].

Conclusions: Most smokers living with bipolar disorder are interested in quitting. The Internet may be a useful cessation tool for recruiting and potentially treating smokers with bipolar disorder who face special challenges when trying to quit and rarely receive cessation treatment from their mental health providers.

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An estimated 31–82% of people living with bipolar disorder use tobacco (1–9) compared to 23.5% of the U.S. general population (10). The high prevalence of tobacco use in persons with bipolar disorder contributes to increased morbidity and

mortality, social isolation, and substantial financial costs to consumers and society (11, 12). The U.S. Center for Mental Health Services indicates persons with serious mental illness are dying 25 years prematurely on average, with tobacco-related chronic diseases being leading causes (13). A recent review of 17 studies with more than 300,000 patients with bipolar disorder reported an increased overall mortality risk of 35–200%

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relative to age- and gender-matched comparison groups without mental illness (14). Cardiovascular disease was the most consistent cause of excess mortality, with elevated rates also found for cerebrovascular and respiratory disorders. The review failed to examine the contribution of tobacco use to the elevated mortality risk.

Individuals with psychiatric or addictive disorders account for nearly half the cigarettes sold in the U.S. (1, 2), yet their use of tobacco has received relatively little investigation. The 2008 update of the U.S. Clinical Practice Guidelines for treating tobacco dependence was informed by over 8,700 tobacco control studies (15), yet fewer than two dozen randomized controlled trials have been conducted with smokers with current mental illness. A recent systematic review of the tobacco treatment literature with smokers with severe mental illness did not identify a single trial conducted with smokers with bipolar disorder (16). Further, smokers with mental illness or addictive disorders are among the most likely to be excluded from clinical trials because they are viewed as 'too complicated.'

The need for research into effective tobacco control strategies for persons with mental illness has been identified (17–19). The National Action Plan for Tobacco Cessation calls for investment in research "to identify treatments for underserved highly addicted smokers, and those with other addictions or psychiatric comorbidities" (20). In 2003, the Center for Tobacco Cessation identified smokers with psychiatric disorders as a priority population (21). The 2006 NIH State-of-the-Science Conference on Tobacco Use: Prevention. Cessation, and Control identified the need to evaluate tailored, multimodal smoking cessation interventions for people with psychiatric comorbidity (22), and the Secretary of Health and Human Services 2010 Tobacco Control Strategic Plan specifically highlighted the need for research to reduce tobacco-related disparities in people with mental illness (23).

The current online study surveyed a large national sample of smokers living with bipolar disorder. The study examined the relationship between mental health and tobacco use among individuals diagnosed with bipolar disorder, including their: smoking habits as they relate to mental health; attitudes and beliefs about smoking cessation; and cessation experiences and intentions to quit smoking. Responses were compared between current and ex-smokers. Study findings may inform the development of more effective smoking cessation programs for people living with mental illness.

Methods and procedures

Data were collected between November 2007 and March 2008 via a link from http://www. DBSAlliance.org, the Depression and Bipolar Support Alliance (DBSA) website. DBSA is a mood disorder peer-support network that provides recovery-focused, whole-health information, programs, and services for consumers, families, clinicians, and the public. DBSA peer-led chapters and support groups serve about 70,000 people each year, and their websites receive over 21 million hits a year.

The online survey was promoted on the DBSA homepage and chat rooms and via DBSA email communications with registered members. The survey was directed at current and ex-smokers and could be completed anonymously. One survey per IP address was allowed to avoid multiple submissions by one respondent. The University of California, San Francisco's Institutional Review Board approved the study procedures.

Sample

A total of 1,106 individuals began the online survey. Those who reported smoking fewer than 100 cigarettes in their lifetime (n = 180), had a diagnosis other than bipolar disorder (n = 237), or did not report their current smoking status (n = 4) were excluded from analyses, leaving a total sample of 685 participants.

Measures

An online survey was developed for the current study to assess demographic characteristics and mental health functioning; frequency (daily versus non-daily), intensity (cigarettes per day when smoking), and duration of tobacco use and current smoking status; prior attempts to quit and methods of quitting; intention to quit smoking; the perceived relationship between mental health symptoms and tobacco use; and among ex-smokers, advice for someone with mental illness to stop smoking (measure is available upon request from the first author). The survey was piloted with DBSA staff members who all were diagnosed with a psychiatric disorder and were either ex- or current smokers. In total, the final survey contained 42 questions, though branch logic determined the number of items asked (e.g., only ex-smokers were asked how long they had not smoked). Respondents were not required to answer all questions, resulting in varying n-values by item.

Analyses

Given how little research has examined tobacco use in smokers with bipolar disorder, the analyses were largely descriptive. Chi-square tests were performed to examine differences between smokers and ex-smokers. Open-ended qualitative advice for quitting smoking was coded for thematic content by the first author and reviewed by outside readers with expertise in tobacco cessation treatment for concurrence.

Results

The sample (N = 685) was largely female (67%), aged 26 to 50 years (67%), and non-Hispanic Caucasian (89%). Less than a third (31%) had a four-year college degree; another 34% reported some college coursework without a degree; 43% reported household income ≤ \$25,000/year. Average age of bipolar disorder diagnosis was 26 (SD = 11) years. At the time of survey completion, respondents' mental health treatment included medication (91%), psychotherapy (56%), and support groups (18%). A few respondents (9%) were not receiving any mental health treatment, in several cases attributed to lack of insurance. A total of 595 respondents finished the survey (87%). Survey finishers and non-finishers (n = 90) did not differ on smoking status, intention to quit, or any of the measured demographic or mental health variables (all comparisons, p-value > 0.10).

Most participants (87%) were current smokers; 13% were ex-smokers. Current and ex-smokers did not differ on demographic characteristics with the exception that ex-smokers were significantly older $[\chi^{2}(5) = 19.78, p = 0.001]$ than current smokers. Age of diagnosis [F(1,553) = 0.52, p = 0.471] did not differ by smoking status nor did type of mental health treatment; however, current smokers rated their current mental health symptoms as significantly more debilitating than ex-smokers (Fig. 1). The sample began smoking at a mean age of 17 years (SD = 6) and smoked a median of 7 years prior to being diagnosed with bipolar disorder; 83% started smoking prior to receiving a diagnosis of bipolar disorder. Most current smokers smoked daily (92%) and averaged 19 cigarettes/day (SD = 11).

Among current smokers, 48% reported smoking to treat their mental illness; 7% said smoking made their symptoms worse and 22% reported smoking "gets in the way of living the life that I want." Nearly all respondents (96%) stated it was somewhat important (10%), important (7%), or very important (79%) that they be in good mental

health when they try to quit smoking. Less than a third reported that a psychiatrist (27%), therapist (18%), or case manager (6%) had recommended they quit smoking and several reported discouragement to quit from mental health providers. Nevertheless, 74% of current smokers expressed a desire to quit; 93% had made at least one lifetime attempt to quit; 65% tried to quit in the past year; and 48% currently planned to quit smoking. Current intent to quit smoking was unrelated to current mental health symptoms [$\chi^2(3) = 5.50$, p = 0.139].

Current smokers reported a median of four lifetime attempts to quit. Reasons for relapse to smoking in a prior attempt to quit were stress (74%), craving cigarettes (26%), and tobacco use by family and friends (21%). Smokers planning to quit (n = 256 of 528) intended to use cessation medication either alone (38%) or with psychosocial support (18%), such as individual or group counseling, physician advice, or a quit-line; 12% intended to quit with psychosocial support alone; and 32% planned to quit 'cold turkey' (i.e., without any medication or support).

Among respondents who did not wish to guit smoking (n = 145 of 567), 97% acknowledged that tobacco use is harmful to their health. Smokers unmotivated to quit, however, were less influenced by the negative aspects of smoking (Fig. 2). Specifically, compared to smokers planning to quit, smokers unmotivated to quit were significantly less concerned about the health consequences of smoking for themselves (38% versus 92%) or friends and family (19% versus 46%), the financial costs of cigarettes (17% versus 65%), and the pervasiveness of restrictions on where you can smoke (3% versus 23%), all group comparisons significant at p-value < 0.05. The most highly rated barrier to quitting was the pleasure of smoking, identified by 69% of unmotivated to quit smokers. Additionally, 35% reported concerns that stopping smoking would make their mental illness worse and 17% did not believe they could quit. Notably, nearly a third (32%) of the smokers who were unmotivated to quit said they would want to quit smoking if their mental health improved.

Ex-smokers (13% of sample) had not smoked for a median of 2.7 years (range: < 1 month to 29 years). Nearly half (48%) quit 'cold turkey', 46% used cessation medications either with (7%) or without (39%) psychosocial support, and 4% quit with psychosocial support alone. Those who quit cold turkey had quit less recently (median = 3 years) than those who reported using a cessation aid (median = past year) (Mann–Whitney U = 465, p = 0.049).

Tobacco use and bipolar disorder

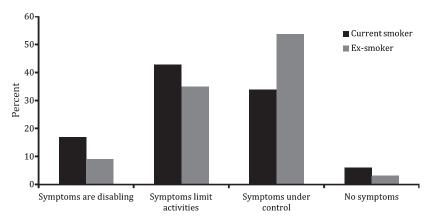


Fig. 1. Mental health symptoms at the time of survey completion for current smokers (n = 519) and ex-smokers (n = 69). The group comparison was significant [$\chi^2(3) = 11.12$, p = 0.011].

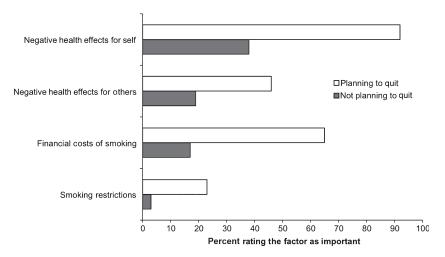


Fig. 2. Factors rated as important in the decision to quit smoking among smokers planning (n = 422) and not planning (n = 145) to quit.

Asked how they maintain abstinence from tobacco, 46% of ex-smokers identified support from family and friends and 43% engaged in wellness strategies such as exercise, healthy diet, and meditation. Few (12%) reported encouragement from healthcare providers to not smoke. The median and modal number of times that ex-smokers attempted to quit before they were successful was five. Most ex-smokers (64%) rated their mental health as poor or fair at the time they successfully quit smoking. The majority (54%) reported no adverse effects of quitting on their mental health symptoms, 18% reported temporary worsening of mental health symptoms that resolved, 21% reported a harder time controlling symptoms, and 7% reported the development of new mental health symptoms (e.g., anxiety, rage). At the time of the survey, 57% of ex-smokers described their mental health as in recovery compared to 40% of current smokers (Fig. 2).

Of the full sample, most respondents recommended promotion of cessation medications (78%) and behavioral approaches (68%) for quitting smoking and 45% recommended support through quit-lines¹ or groups. Compared to current smokers, ex-smokers were more likely to recommend use of motivational strategies [57% versus 35%; $\chi^2(1) = 11.52$, p = 0.001].

DBSA is a peer-support network with members sharing advice and encouragement. Ex-smokers diagnosed with bipolar disorder are a unique resource with insights into, and personal experiences with, the struggle to quit a powerful addiction while managing mental illness. When ex-smokers were asked what kind of information would be most useful in helping someone with mental illness stop

¹Tobacco quit-lines (accessed via 1-800-QUIT-NOW) offer individual tobacco cessation counseling by trained counselors at no cost to the caller; some state quit-lines also provide cessation pharmacotherapy.

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smoking, several themes emerged (Table 1). Specifically, advice centered on emphasis of the negative consequences of smoking, the benefits of quitting, and cognitive-behavioral and pharmacologic strategies for quitting.

Discussion

The current online survey had five key findings: (i) many individuals living with bipolar disorder report smoking to help treat the symptoms of mental illness; (ii) most want to quit smoking and many are actively planning or trying to quit smoking; (iii) few are advised to quit smoking by a mental health provider; (iv) most have made multiple failed attempts to quit, many unaided with cessation medications or counseling; and (v) quitting smoking is associated with mental health recovery. Additionally, the response to this online survey (685 respondents meeting criteria recruited in four months' time) indicates the Internet may be a particularly useful channel for recruiting people living with bipolar disorder into tobacco cessation treatments.

Most respondents were current daily smokers and smoked nearly a pack a day. They started smoking in their teen years and smoked a median of seven years prior to being diagnosed with bipolar disorder. Many respondents believed smoking helped relieve stress and manage symptoms of mental illness. Yet, similar to the general population of smokers, more than 70% wished to quit smoking (24). Further, about two out of three smokers in the survey had seriously attempted to quit smoking in the past year and nearly half were planning to quit smoking in the upcoming year. Notably, intent to quit smoking was unrelated to severity of current mental health symptoms. Among motivated and unmotivated to quit smokers, concern about physical illness was the primary motivator for cessation.

These results suggest that smokers diagnosed with mental illness have much in common with the general population of smokers. They spend a great deal of time and resources thinking about smoking cessation and trying to quit and are concerned about the negative health consequences. Smokers in this survey, however, had the added burden of managing

Table 1. Ex-smokers' advice to help someone living with mental illness to stop smoking

Appreciate the negative consequences of smoking

Neurocognitive effects: Stop smoking. It interferes with brain chemicals that may already be disrupted by illness and medication. **Physical health:** Mental illness may seem to compound the need to smoke, but the illness is difficult enough without the added worry of your physical health being compromised. Don't wait until you have COPD (lung disease). I did.

Emotional health: Smoking not only destroys your health, it creates an addiction, which can complicate emotional stability.

Stigma: A lot of people with mental illness smoke, so why advertise that you have a mental illness.

Emphasize the benefits of quitting

Physical health: I do not suffer from bronchitis and pneumonia 3–4 times a year anymore or repeated sinus infections/sore throats. You'd be surprised too how much your taste buds and sense of smell improve.

Emotional health: You think that the smoking cures your anxiety but I never realized until I quit that the nicotine was what made me anxious and then the addiction kept me feeling like it was the only way to cope.

Self-confidence: Until I quit, I didn't know how to act in adult situations. I had smoked since I was a kid (and) I hid behind the cigarettes to cope. I am a lot stronger than I thought. Quitting has made me more self-confident.

Self-liberation: Don't think of it as losing a friend, think of it as gaining your freedom.

Recommended cessation strategies

Cognitive strategies:

- · Be gentle with yourself.
- Don't talk yourself out of trying, and don't let slips convince you that you can't do it. It is probably the most difficult thing you'll ever do, but you can do it.
- Part of it is mind over matter: Smoking is not an option. Keep thinking how much healthier we can be.
- Be really sure it is what you want. I am in the middle of a crisis and am not in good shape and I think I might be better if I was smoking.
 But maybe not. I don't want to start again and have my life still suck AND I smoke again. Then I have two things to deal with.

Behavioral approaches:

- A routine benefits a person with mental illness who wants to quit smoking.
- Discover why smoking calms you and understand nicotine's effect on your mood. Then try to find something that equates or will come close to that effect (in a good way).
- Gather friends, family, professional doctor/therapists around you. Stay away from negative people and fellow smokers until you feel stronger. Avoid alcohol at all costs and keep a quit-journal.
- Removing nicotine and the habits associated with it are significant and will likely affect your ability to think and concentrate. There is likely to be physical agitation as well. Walk or do something to spend your energy.

Medication:

- Part of it is medication to take care of the nicotine addiction.
- Ask your doctor about medications (e.g., bupropion, varenicline, nicotine replacement).

COPD = chronic obstructive pulmonary disease.

pre-existing mental health issues when trying to quit. Smokers in our survey believed that good mental health was important for quitting, and they believed that quitting smoking would lead to increased mental health problems, possibly because many reported smoking to relieve symptoms of mental illness. Social support networks and healthcare providers may perpetuate these beliefs (25).

Though widely available, cessation medications were underutilized by survey respondents; 46% of ex-smokers used cessation medications to guit and 56% of respondents planning to guit anticipated using them. Nicotine replacement therapies carry a low risk profile and are affordable in generic form (i.e., cheaper than cigarettes), and several modalities (gum, lozenge, and patch) are available over the counter. Bupropion and varenicline are available by prescription only and carry black box warnings for suicide risk and aggressive behavior (26). Additional concerns for use with bipolar disorder patients include the potential for bupropion, as an antidepressant, to precipitate a manic episode, though there is some evidence that bupropion may be the antidepressant least likely to precipitate a manic episode (27), and bupropion is a firstline recommended treatment for pharmacological management of acute bipolar I depression (28). Additionally, the renal clearance of varenicline may be a concern given that some consumers with bipolar disorder may have compromised kidney function due to chronic lithium use. Both bupropion and varenicline are effective treatments for quitting smoking in the general population, and clinical trials experience is needed with smokers with bipolar disorder. In the absence of such data, oversight and monitoring by a physician, ideally a psychiatrist, are warranted.

In the current study, respondents who wished to quit smoking were unlikely to receive professional help. Provider counseling doubles the likelihood that a smoker will quit and enhances medication adherence (15). In the behavioral healthcare setting, smoking cessation counseling appears to be a low priority, according to our survey and that of prior research (29-31). Some survey respondents indicated they wanted to try to quit smoking, but their mental healthcare providers actually discouraged them from doing so. People living with mental illness know that smoking has a negative effect on their health and wellness, yet the system is failing to support them in this important step to improved health. When a provider fails to recommend smoking cessation, a message of hopelesscommunicated. Hopelessness helplessness are two of the greatest barriers to recovery (32).

Ex-smokers in the current sample reported better mental health than current smokers. Given the cross-sectional design of the study, it is possible that respondents with higher functioning were better able to quit; however, the majority of ex-smokers reported quitting with suboptimal mental health. Further, although many ex-smokers indicated that quitting smoking was a strain on their mental health in the short term, most indicated that it ultimately helped them to realize greater wellbeing. At the very least, the current data indicate that quitting smoking did not negatively impact the long-term functioning of people living with bipolar disorder. The findings are consistent with increasing evidence that when provided with tobacco dependence treatment, people living with active mental illness are able to successfully quit smoking and without threat to their mental health recovery (33–36).

Ex-smokers recommended treatment that combined medication and counseling and, relative to current smokers, were more likely to recommend the use of motivational approaches. Ex-smokers' personalized advice for quitting was relevant, aligned with evidence-based treatments, and is informative for tailoring interventions to smokers with mental illness, including: recognition of the negative effects of tobacco on mental health symptoms and perpetuation of anxiety; development of alternative coping strategies; the importance of structure and routine; avoidance of alcohol as a trigger to smoking; seeking support from mental health providers; and physical activity for addressing agitation associated with nicotine withdrawal. For maintaining abstinence, nearly half of ex-smokers identified support from family and friends and engagement in wellness strategies such as exercise, healthy diet, and meditation as important.

Nearly half the sample recommended support through quit-lines or groups. In clinical trials, tobacco quit-lines have demonstrated efficacy in promoting quitting (15, 37). Toll-free quit-lines provide cessation counseling to smokers who might otherwise have limited access to medical treatment, because of geographic location or lack of insurance or financial resources. Recent data from the California quit-line indicated nearly one in four callers met criteria for major unipolar depression; notably, quit-rates were significantly lower among callers with depression, suggesting the need for more specialized supports (38).

This online survey was designed to gather information on a sample of people who use the DBSA services and programs. Some limitations are apparent. The sample may not be representative of

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outpatients with bipolar disorder. Self-selection may have led to a biased population; ethnic/racial diversity in our sample was limited; and respondents had to have Internet access and computer literacy to complete the survey. Tobacco use and diagnosis of bipolar disorder were self-reported. The subsample of ex-smokers was small, although our pool likely approximates population statistics.

We believe we were successful in our objective of gathering information that would inform smoking cessation programs and tobacco control policies for people living with bipolar disorder. The current findings underscore the need for new delivery channels, given the low levels of cessation treatment in traditional behavioral healthcare, and demonstrate the utility of the Internet for reaching large numbers of people living with bipolar disorder who smoke. Specifically, the DBSA websites get 21 million hits a year, offering huge potential for engaging smokers with mood disorders in cessation programs. Studies in the general population of smokers have demonstrated effectiveness of some Internet-delivered cessation programs, and study is needed in more specialized populations (39). Tobacco treatment education and training of mental health providers certainly is needed and existing curricula are being disseminated (40). Healthcare providers of all kinds can increase smoking cessation rates by addressing tobacco use with patients and providing treatment (41). The Internet, however, can deliver evidence-based treatments directly to users for health promotion and disease prevention. The high level of interest in quitting smoking among smokers with bipolar disorder in the current study supports the demand for such programs.

Smoking cessation should be a leading priority for addressing disparities in death and disability among people living with bipolar disorder. Consumers want to quit smoking, are contemplating quitting, and are actively trying to quit smoking. Tobacco is not medication. It is a deadly addiction and alternatives for managing stress and mood exist that are not carcinogenic or cardiotoxic. To improve the quantity and quality of life, smoking cessation should be viewed as an integral part of wellness for all people.

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