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Chapter V

Motivating Adolescent Smokers to Quit through a School-Based Program: The Development of Youth Quit2Win

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Abstract

Fifty four percent of United States high school students have tried some form of tobacco and 23% report regular tobacco use. Over half of adolescent smokers have tried to quit within the past year, but most were unsuccessful. This suggests youth have a high level of interest in quitting but may need additional help and support in maintaining their motivation to quit. The Tobacco Dependence Program at UMDNJ- School of Public Health developed the school-based Youth Quit2Win Program designed to educate adolescent smokers about tobacco, and increase motivation to quit. This chapter summarizes the development of this youth smoking education and cessation program and presents preliminary outcomes. Over three academic years from 2003-2006, 327 adolescents participated in the program. Each year the program was modified based on the previous year's experiences and feedback from both students and school staff. The 10-session (8 week) group format appears to be suitable for school staff to run, and successful in helping adolescents to maintain their motivation to reduce or quit smoking.

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Almost a third of the participants reduced their weekly cigarette consumption by at least 90% by the end of the program.

Introduction

Tobacco smoking is the single largest cause of premature death in the United States (Thun, Apicalla and Henley, 2000), causing 440,000 premature deaths, and over 8 million cases of serious smoking-related illnesses per year (CDC, 2003). Unassisted youth quit rates are very low, (Sussman, Dent, Severson, Burton and Flay, 1998) although most U.S. adolescents who smoked at least 100 cigarettes in their lifetime reported that they have (unsuccessfully) tried to quit at least once. (CDC, 2006). This suggests a high level of interest in quitting, and frequent attempts to quit by young smokers, but also that youth may benefit from additional help and support to quit and to maintain their motivation to quit. In the absence of an effective intervention, it is likely that youth smokers will continue to smoke throughout adulthood. Sussman et al. (1999) estimated that only 3% of unassisted youth attempts are successful.

Most programs that attempt to reduce smoking in young people focus on prevention of smoking initiation. However, effective smoking cessation programs designed to address the unique needs of young people who are already using tobacco are rare. It has been recommended that cessation programs educate youth about tobacco, as well as help them become and stay motivated to quit (Fiore et al., 2000). Youth may have difficulty maintaining their motivation to quit on their own as their motivation may change on a daily basis due to the frequent changes in life circumstances and other demands placed on teenagers (DiClemente, 1999; Henningfield, Michaelides, and Sussman, 2000) and the general “storm and stress” associated with adolescence (Arnett, 1999; Larson and Ham, 1993). In addition, youth may have difficulty coping with non-supportive family and friends (Falkin, Fryer, Mahadeo and Gregory, 2007). Addressing motivation in programs has the potential to yield positive program outcomes. McCuller, Sussman, Wapner, Dent and Weiss (2005) focused on motivation in a study and found not only that students who participated in their smoking cessation program designed to increase and maintain motivation were more likely report higher motivation to quit smoking than those in the control group, but they also found higher motivation was related to quit rates. Dino, Kamal, Horn, Kalsekar, and Fernandes (2004) also reported similar findings among youth who participated in the American Lung Association’s Not-on-Tobacco (N-O-T) Program, which increased quit rates even in youth with low baseline motivation.

It has been suggested that motivation and quitting success are also strongly influenced by withdrawal symptoms (Baker, Brandon and Chassin, 2004). Thus, another necessary component of youth smoking cessation interventions is helping youth manage their nicotine withdrawal symptoms. Youth, like adults, can become addicted to nicotine and experience many of the withdrawal symptoms (Prokhorov, Hudmon, Cinciripini, and Marani, 2005) which include depressed mood, insomnia, irritability, frustration or anger, difficulty concentrating, restlessness, and increased appetite (American Psychiatric Association, 1994). Though these phenomena are generally common to adolescence, youth smokers were found

to experience them to a greater extent (Prokhorov et al., 2005). O'loughlin, Kishchuk, DiFranza, Tremblay and Paradis (2002) also found that youth smokers endorsed all nicotine withdrawal symptoms with the exception of depressed mood. While new smokers may initially smoke for social reasons, it is clear that youth smokers experience symptoms of nicotine dependence prior to smoking on a daily basis. More experienced heavy smokers tend to smoke to help control withdrawal symptoms. (Piper et al., 2003; DiFranza et al., 2007). Although nicotine withdrawal symptoms typically persist for two to four weeks, they can last longer (Piasecki, Fiore and Baker 1998, Piasecki et al., 2000) and youth may not be able to cope with the additional symptoms on top of the emotional instability common in adolescents. As a result their attempts to quit or cut down may be short lived as they may resume smoking to avoid the negative effects of withdrawal or to gain the perceived mood enhancing effects of tobacco (Baker, Brandon and Chassin, 2004).

Adolescents may benefit from tools to help them maintain their motivation to quit, and to help maintain their motivation to stay away from tobacco once they have quit. In addition, they may benefit from help coping with stress, and withdrawal symptoms which may arise after quitting or reducing tobacco. The Tobacco Dependence Program at UMDNJ-School of Public Health has developed and piloted a school-based tobacco education and cessation program, "Youth Quit 2 Win", designed to incorporate tobacco and health education, peer social support and media literacy. This chapter will discuss the rationale and development of the program, pilot studies and initial findings with respect to participant motivation, withdrawal symptoms, and the relationship between these variables and success in smoking cessation and reduction.

Early Development of Youth Quit2Win: 2003-4

In 2003, the Tobacco Dependence Program (TDP) at UMDNJ-School of Public Health developed and piloted a school-based smoking cessation program for adolescents. Development began with a literature review of existing youth tobacco cessation group programs combined with practical knowledge from group treatments for adult smokers. This guided decisions regarding the group's format and components. For example, it was discovered that groups would need to be run during regular school hours because of transportation issues with students, as well as extra-curricular activities limiting attendance after school. In addition, boys and girls would be in the same groups. It was evident that where there was difficulty recruiting a sufficient number of youth to participate, it would be even harder to recruit enough students to run single-sex groups. It was also clear that in the legal context governing New Jersey schools, it would not be possible to provide pharmacotherapy (e.g. nicotine patches) at school (outside of certain schools with their own health service).

An assessment protocol and group curriculum was developed by adapting TDP's existing group program which has proven successful for adults (Foulds et al., 2006) so that it better fit the perceived needs of young people. This was intentionally designed as a piloting process in which staff from the TDP had the flexibility to change the group format according to their judgment and feedback from youth participants in order to find out whether the changes

resulted in any improvements. High schools in New Jersey with an interest in running a group to help students quit smoking were identified. A point-person, (usually the Student Assistance Counselor /Substance Abuse Counselor [SAC], someone from the school's counseling department, or the school nurse) was identified at each school. The point person was provided with information about the group and it was their responsibility to recruit the students to attend the group. This school staff member also observed and assisted with the group as a training experience, while the group was lead by a TDP staff member with training in tobacco treatment. TDP staff members attended the school to conduct assessments, and then ran an 8-session group over 6 weeks, with the target quit date (TQD) being on the third session. Basic baseline measures were recorded, as was attendance, tobacco use and expired carbon monoxide at each group meeting. Main outcome measures were (a) number (%) abstinent at the end of the group meetings (i.e. not used any tobacco in the previous 7 days, one month after the TQD, validated by a measurement of exhaled carbon-monoxide (CO) of less than 10 parts per million), (b) number (%) who significantly cut down on their tobacco use by the end of group (defined as smoking 10 or less cigarettes that week), and (c) structured and open-ended comments by the young people on an evaluation questionnaire administered at the last group meeting.

Results 2003-4

Five groups were run in 4 high schools. Forty-seven young people were assessed for participation (mean =9.4 per group) and agreed to attend the groups. Thirty-seven (79% of those assessed) actively participated (i.e. attended at least half of the group sessions), with an average of 7.4 participating per group (range, 4-12). Of those who did not actively participate (10), all dropped out or were advised not to attend after attending only 0-2 sessions (i.e. prior to the target quit date).

Of the 37 participants, 18 (49%) were girls, 29 (78%) were white, 16 (43%) smoked more than 10 cigarettes per week day, with almost all smoking more than 10 per day at the weekend. 19 (51%) were not in the "preparation" stage of change at the time of the assessment (i.e. were not planning on quitting smoking within the next 30 days). Many reported that they'd like to quit, but within the next 6 months.

The average attendance at each group session was 6.9, with 32 (86%) students attending the last group meeting. At the last group meeting 7 (19%) were abstinent, and an additional 10 (27%) had smoked less than 10 cigarettes in the previous week (all with an exhaled CO less than 10 parts per million).

The largest change in the group format was made after the first two schools. For the last three school groups, the style was changed to create more structured activities (as suggested by one of the group members), to encourage students to make a commitment to quit and attend the following week (verbal commitments made at the end of each session), and to assist students to access nicotine replacement therapy. Of the first two groups, only one student quit (6%), whereas of the last three groups, 6/21 (29%) quit and a further 29% cut down to less than 10 cigarettes per week (43% on less than 20 cigarettes per week).

The students frequently stated that they liked having the support of their fellow students in the group, and the most frequently suggested change was that there should be more group meetings (particularly as each one could only last for less than a 40 minute class period).

Discussion 2003-4

Unlike participants in adult groups where most participants are ready to quit in the next 30 days, students had difficulty making this commitment. Readiness to quit could also be assessed by a student's level of participation and if they made some positive changes during the course of the week. It was also very clear that students needed a more structured group experience including topics to stimulate discussion and stay focused, as well as activities to encourage interaction. The curriculum did not only include tobacco specific education, but "life skills" to help students deal with difficult situations. Adding these components enhanced both the experience for the students and the outcomes, such that in the last three groups, 29% quit smoking and a further 29% cut down to less than two cigarettes per day (i.e. 58% quitting or reducing). Receiving weekly feedback from both students and facilitators, allowed the authors to review issues on an ongoing basis and make necessary revisions for subsequent school years. The initial 8-session program was lengthened to 10-sessions, the quit date was moved from week two to week four (allowing students more time to reduce their consumption gradually without the use of medications and to reduce withdrawal symptoms), and week four included an extra pre and post quit session to give students the extra support they needed during their quit week.

Conclusion 2003-4

The Youth Quit2Win group format appeared to be both helpful and appropriate for young people (particularly after adjustment based on student suggestions). It had good attendance (86% attending the last group meeting) and reasonable short term quit rates (19% overall, but 29% after change in format), with a significant additional proportion (27%) cutting down their cigarette consumption to less than 2 per day.

Youth Quit2win 2004-5

For the 2004-5 academic year the Youth Quit2Win (YQ2W) program was extended to 10 sessions. The next stage in its development was to find out whether the program could feasibly be delivered by existing school staff (rather than external university staff specializing in tobacco treatment).

Thirty-seven New Jersey school professionals (primarily SACs but also including counselors, teachers and nurses) were given three days of training in implementing the YQ2W program. Youth Q2W facilitators were trained on tobacco use and young people, assessing tobacco addiction, medical complications caused by tobacco use, and medications

used for treating tobacco addiction. They become familiar with marketing strategies by the tobacco industry and how school policy impacts students' use. Facilitators were taught how to properly determine if a student was appropriate for group. In addition to the curriculum, facilitators were given tips for marketing YQ2W in their high schools. They were asked to go back to their schools, begin to market and recruit students for group. At each session, facilitators were asked to collect information by completing two YQ2W forms. One form focused on the experience they had running the group and the other tracked student progress. The student form tracked how many cigarettes each student had smoked that week as well as recording their exhaled carbon monoxide levels. After each session, facilitators were encouraged to provide additional feedback (evaluating that particular lesson) to the Tobacco Dependence Program on how the group was progressing.

Results 2004-5

Staff from 34 schools received the training. Of the 32 eligible high schools, 10 schools did not initiate a group. The most commonly cited reason was a lack of time within an already hectic schedule. Of the 22 schools implementing the program, 19 completed at least one entire Youth Quit2Win group program. Based on the information provided by the schools, approximately 131 high school students consistently participated in Youth Quit2Win groups. The average number of cigarettes smoked per week decreased from 50 (at assessment) to 16 (at last session). Carbon monoxide levels averaged 8 (parts per million) at assessment and decreased slightly to 6 ppm by the last session. 8 students (6%) stated that they had quit smoking by the end of the group and a further 34 students (26%) reduced their tobacco consumption by 50% or more. One middle school also completed a Youth Quit2Win program and it is worth noting that 50% (3 students) were abstinent by the end of that program.

Conclusion 2004-5

The schools reported that the YQ2W intervention was beneficial for students. It was noticeable that over the first two years, less than 50% of the students attending the group rated themselves as ready to quit in the next 30 days. It was therefore decided to adjust the format and presentation of the program slightly to be more explicit about the fact that the first four sessions are primarily educational/motivational (although reduced smoking is involved), and also to explicitly state that if the young person does not feel ready to try to quit by session five they are free to stop attending. It was also decided to require the schools to collect more comprehensive data on the students' baseline characteristics and progress on the program.

Youth Quit2win 2005-6

As in the previous year, school counselors (primarily SACs) attended a two-day Youth Quit2Win training. An additional follow-up training day was incorporated to help assure facilitators were recruiting students and began group sessions. Across fourteen schools within the state of New Jersey, 159 students participated and completed the baseline assessment. Again, the program was held during regular school hours. Advertisements, school announcements and lunch time informational booths were used to recruit youth who were motivated to quit smoking, and wanted to join a smoking cessation program of their own volition.

Baseline Measures

Before the start of the program participants measured their exhaled carbon monoxide with a CO monitor, and completed a baseline assessment questionnaire. The self-administered assessment survey collected basic demographic information such as gender, age, grade, and race/ethnicity. The assessment also asked participants about their lifetime and current tobacco use history, quit history, motivation, nicotine withdrawal symptoms, and social support networks. It incorporated items from the Fagerström Test of Nicotine Dependence (FTND) (Fagerström, 1978), the Hooked On Nicotine Checklist (HONC) (DiFranza et al., 2002), and the nicotine dependence criteria according to the Fourth Edition Diagnostic and Statistical Manual of Mental Disorders (DSM) (APA, 1994). Selected sample questions are provided below as they appeared on the self-administered survey. (Items followed by an “F” are from the FTND, items followed by a “D” are taken from the DSM, and items followed by an “H” are taken from the HONC.)

Tobacco Use History Sample Questions

Cigarettes

- I have never smoked cigarettes.
- In the past, I have smoked cigarettes.
- I currently smoke cigarettes.

How many cigarettes do you smoke *per week day*?^F _____

How many cigarettes do you smoke *per weekend day*?^F _____

(This question repeats to ask about other forms of tobacco (i.e. cigars, chew, bidis and kreteks))

How many days in the last 30 days have you smoked or used tobacco?^D _____

How old were you when you first tried tobacco? _____

How old were you when you first began using tobacco on a regular basis (e.g. every week)? _____

What is the main reason that you smoke? Check only one.

- To help me fit in with my peers.
- To help me look/act older.
- To give me something to do.
- To help me relax/feel calm.
- To help control my weight.
- To help me think/concentrate
- Other (please specify below) _____

How soon after you wake up do you smoke your first cigarette or use tobacco products? ^F
 _____ hours _____ minutes

What brands of tobacco have you used in the last 30 days? List each brand and then circle if it is Menthol or Mild/Light.

Brand	Menthol		Mild/Light	
	Yes	No	Yes	No

Which brand is your favorite? _____

Nicotine Withdrawal Symptoms Sample Questions

Do you ever have strong cravings to smoke? ^H Yes No

Have you ever felt like you really needed a cigarette? ^H Yes No

When you tried to stop smoking, or when you haven't used tobacco for a while...

Did you find it hard to concentrate? ^{HD} Yes No

Did you feel more irritable? ^{HD} Yes No

Did you feel a strong need or urge to smoke? ^H Yes No

Did you feel nervous? ^H Yes No

Did you feel restless? ^{HD} Yes No

Did you feel anxious? ^{HD} Yes No

Did your appetite increase? ^D Yes No

Did you have difficulty sleeping? ^D Yes No

Did you have feelings of sadness? ^D Yes No

Have you ever felt like you were addicted to tobacco? ^H Yes No

Quit History Sample Questions

Have you ever tried to quit, but couldn't? ^H Yes No

How many times have you tried to quit? _____

Do you smoke now because it is really hard to quit? ^H Yes No

Motivation Sample Questions

Please *check the one statement that best* describes your *current situation* with regard to your tobacco use.

- I would like to quit tobacco within the next 30 days
- I am thinking about quitting tobacco use in the next 6 months
- I am not thinking about quitting tobacco use but I am thinking about cutting down
- I have no desire to quit smoking.
- I have already quit smoking, but would like some help to stay quit.

Are you interested in joining a stop smoking support group? Yes No

I would rate my current motivation to quit smoking/tobacco as.... (Circle one)

Not at all Motivated	Slightly Motivated	Somewhat Motivated	Very Motivated	Extremely Motivated
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What are your main reasons for wanting to quit tobacco products? _____

Social Support Sample Questions

Who do you think will be helpful to you in quitting tobacco products? _____

Do you live with a smoker(s)? Yes No

Are most of your close friends smokers? Yes No

Are you allowed to smoke at home? Yes No

Program Protocol

Following assessment were ten group meetings (sessions), each with a different tobacco-related topic. The first four sessions were designed to for the quit day and to provide

information and stimulate discussion about tobacco and health. For each of these sessions, members were encouraged to reduce their tobacco consumption by half by the following session. Therefore, in theory, if a student was smoking 80 cigarettes per week (CPW) at baseline, by the fourth session they should have smoked only ten cigarettes in the previous week; already having significantly reduced their cigarettes consumption before Quit Day. The fifth session was the designated Quit Day. The last four sessions were dedicated to maintaining quit status and to continue to help and encourage those who did not yet quit. They included tips for coping with withdrawal symptoms, and how to handle situations that might trigger cravings.

All sessions strived to increase the participants' motivation to quit by offering peer support and encouragement. In addition, the program included a media literacy component. Participants analyzed tobacco advertisements to gain an understanding of how tobacco companies target youth and manipulate them into buying their products. Money management activities were also included to help youth appreciate how much money they save when they refrain from buying tobacco. In past studies, media literacy programming has been found to increase reflective thinking, understanding of tobacco media messages, and perceived peer norms among youth whether or not they had previously used tobacco (Pinkleton, Austin, Cohen, Miller and Fitzgerald, 2007; Austin, 2005) Media literacy also had a positive impact on motivation to resist smoking-related influences (Pinkleton, Hust and Cohen, 2007).

The group met weekly with the exception of sessions four, five (Quit Day) and six which were held on three consecutive days to offer maximum support around the designated quit day. (See figure 1.) Since the group met during school hours, the day of the week and time of day varied week to week for each group session so that students would not miss the same class each week.

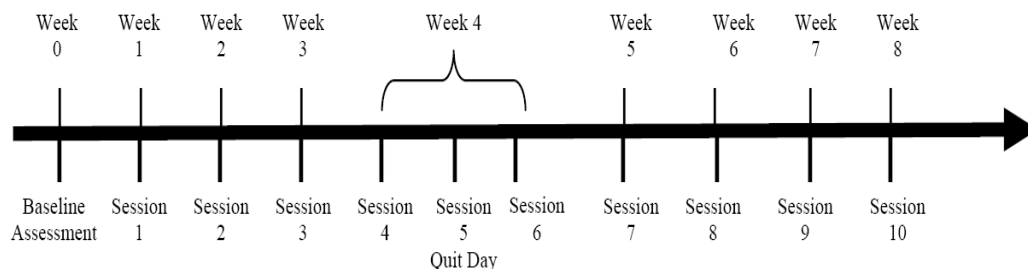


Figure 1. Timeline of Youth Quit 2 Win Program.

Weekly Assessments

At each session, group members measured their exhaled CO levels and filled out weekly questionnaires about their tobacco use for the past seven days and motivation levels and withdrawal symptoms based on the DSM criteria. Selected sample items follow as they appeared on the self-administered weekly questionnaires.

Have you used any tobacco in the last 7 days? Yes No
 If you answered yes, how much tobacco have you used during the past 7 days? _____
 How would you rate your motivation to quit smoking/tobacco use?

Not at all Motivated	Slightly Motivated	Somewhat Motivated	Very Motivated	Extremely Motivated
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Please rate yourself for the past 7 days using the following scale:

	None	Slight	Mild	Moderate	Severe
Depressed mood (sad)	0	1	2	3	4
Insomnia (sleeping problems)	0	1	2	3	4
Irritable, frustrated, angry	0	1	2	3	4
Anxious	0	1	2	3	4
Difficulty concentrating	0	1	2	3	4
Restless	0	1	2	3	4
Increased appetite (hungry)	0	1	2	3	4
Desire or craving to smoke	0	1	2	3	4

Results 2005-6

Of the 159 students who completed a baseline survey, 30 students dropped out of the program before Session 5 (Quit Day) leaving 129 students for analysis. The 30 students who dropped out prior to the 5th session had significantly lower baseline motivation to quit smoking as compared with the 129 who continued after the 4th session. Some of the students who dropped out before Quit Day were mandated to attend as a punitive measure for breaking smoking rules at their schools, despite ongoing communication that this group was only for youth who were motivated to quit.

All data were analyzed using SPSS (Version 15.0 for Windows) software. The alpha level was set at 0.05 to determine statistical significance. Frequencies, means, chi-squared and regression analyses were used to analyze all data and compare data across time.

Males and females were equally represented in the sample. The majority identified as white, followed by Hispanics. African-Americans, Asians and students who identify as "Other" (e.g. Native American, Middle Eastern) each made up less than 5% of the sample. A small proportion identified as mixed race/ethnicity. The mean age of participants was 16.3 (S.D. = 1.5). Students from 10th, 11th and 12th grades were evenly represented in the population. Ninth grade students represented only 9% of the sample. (See table 1.)

Table 1. Demographic characteristics of the students who had a baseline assessment and who attended through Session 5 or beyond

	(%)	N
Gender		n=127
Male	52.8	67
Female	47.2	60
Race/Ethnicity		n=128
White	72.7	93
African-American	3.1	4
Hispanic	7.8	10
Asian	2.3	3
Other	4.7	6
Multi-Racial	9.4	12
Grade		n=126
9 th grade	8.7	11
10 th grade	27.8	35
11 th grade	34.1	43
12 th grade	29.4	37
Age		n=126
<=15	25.4	31
16	28.6	36
17	31.0	39
18+	15.1	19

Tobacco Use

More than half, 68% (82/120) of the students first tried tobacco at or before the age of 13 and most, 71% (106/127) began using tobacco on a regular basis at or before the age of 14. The majority of participants, 80% (101/127), reported they had tried at least once to quit using tobacco products, but could not. Of those who reported making at least one previous quit attempt, the average number of quit attempts was 4.1 (S.D. = 4.6).

At baseline, when asked about previous quit attempts, many participants reported they had nicotine withdrawal and addiction symptoms. More than two-thirds experienced irritability and strong urges to smoke. Three-fifths suffered difficulty concentrating and anxiety. Approximately half experienced restlessness, and increased appetite, while about one-third experienced sadness, nervousness and difficulty sleeping. Further, the majority felt they were addicted to tobacco. (See table 2.)

Table 2. Number and percentage of participating youth who reported various nicotine withdrawal symptoms during a previous period of abstinence

Criteria	%	N (128)
Urge to smoke H	85.9	110
Irritability HD	73.2	93
Feel anxious HD	60.2	77
Difficulty concentrating D	60.2	77
Feel restless HD	50.8	65
Increased appetite D	44.5	57
Feel nervous H	34.4	44
Difficulty sleeping D	33.1	42
Feel sad D	29.7	38
Feel addicted to tobacco H	76.6	98

H=items taken from the HONC, D= items taken from the DSM-IV.

Motivation and Quit Plan

Similar to previous findings, (Leatherdale, 2006) the majority of participants (85.2%) were interested in joining a smoking cessation support group but there was a considerable range of motivation to quit. One-third (37/114) reported being “very” or “extremely” motivated to stop smoking, 47% (54/114) were “somewhat” motivated, 17% (19/114) were “slightly” motivated, and 4% (4/114) were “not motivated” at all. With respect to their quit plan, 45.7% (59/129) students said they were planning on quitting within the next 30 days, 38% (49/129) planned to quit within the next six months and 7% (9/129) said they wanted to cut down. Four percent (5/129) said they recently quit (within the past ten days), but wanted help to stay quit. Two percent (3/129) said they had no desire to quit.

In accordance with the literature (Riedel, Robinson, Klesges, and McLain-Allen, 2002; Singleton and Pope, 2000), the most highly cited reasons for wanting to quit smoking included health-related concerns (58.3%), to save money (25%), and because smoking interfered with hobbies and sports (14%). Some smokers also endorsed wanting to quit smoking because it “tastes or smells disgusting” (14%).

Program Findings 2005-6

Motivation

Baseline motivation to quit at assessment was not found to be significantly related to baseline cigarettes per week (CPW) ($p=1.5$). None of the students who reported they were “not motivated” at baseline subsequently quit. However as hypothesized, motivation at the last session was found to be significantly associated with the final CPW ($p=.003$). For example, those who rated themselves as “very” or “extremely” motivated at the last group

meeting smoked an average of 18.4 CPW (S.D.= 21.1) while those who rated themselves as “somewhat”, “slightly” or “not at all” motivated averaged 25.6 CPW (S.D.=31.4). Overall motivation increased significantly throughout the course of the program ($p<.001$).

Quitters and Reducers

Forty students (31%) reduced their weekly cigarette intake by at least 90% including 18 students (14%) who quit (i.e. reported zero CPW at the end of the program supported by a low CO). As expected, at program end, there was a significant difference in motivation levels between those who quit or reduced, and those who did not ($p=002$). With a range of 0 to 4, the mean motivation for those who did not quit or reduce was 2.54 (S.D.= .82), while those who quit had a mean motivation of 3.30 (S.D.=.87). Those who did quit or reduce were more likely to report being very or extremely motivated at their last session.

Withdrawal Symptoms

While there were significant changes in reported withdrawal symptoms as the program progressed, the results were not as expected. Between the first and final session symptom reports, most withdrawal symptoms were significantly *reduced*. (See table 3)

Table 3. Nicotine Withdrawal Symptoms during Session 1, Session 4, Session 5 (Quit Day), Session 6 and Session 10

	Session 1		Session 4		Session 5		Session 6		Session 10	
	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D
Depressed mood	1.29	1.17	1.42	1.37	1.15	1.22	1.45	1.35	1.06	1.35
Concentration	1.45	1.38	1.41	1.37	1.20	1.36	1.45	1.39	1.08*	1.33
Hunger	2.03	1.32	2.11	1.33	1.67	1.39	1.95	1.36	1.55*	1.45
Restlessness	1.56	1.29	2.13	4.72	1.45	1.23	1.59	1.43	1.15*	1.33
Insomnia	1.74	1.35	1.64	1.42	1.59*	1.36	1.79	1.45	1.20*	1.40
Anger	1.58	1.37	1.49	1.41	1.40	1.30	1.55	1.41	1.07	1.30
Anxiety	1.57	1.46	1.52	1.46	1.49	1.43	1.61	1.38	.97*	1.18
Desire to smoke	2.67	1.39	2.64	1.29	2.26*	1.46	2.64	1.30	1.96*	1.56

* significant change from Session 1 based on paired t-tests.

Quitters and Reducers

There was a significant difference in the levels of desire to smoke between those who quit or reduced by 90%, and those who did not ($p=.004$), where those who reportedly quit or reduced were more likely to report low desire to smoke at the end of the program. Among those who quit or reduced by 90%, there were also significant reductions in reported

symptoms between Session 1 and final session reports of anger, anxiety, difficulty concentrating, hunger, and the desire to smoke.

Discussion 2005-6

By the end of the program, 14% reported they quit (i.e. smoked no cigarettes in the past 7 days). An additional 52% had reduced their tobacco consumption by at least half. In total, 31% either quit or reduced their cigarette intake by at least 90%.

Most students who quit reported being “somewhat” (35%), “very” (41%) or “extremely” (18%) motivated at baseline. However one student indicated he was only slightly motivated to quit at baseline and yet, he quit smoking by the end of the program. Though his motivation level was low, he did indicate that he wanted to quit within the next thirty days. His baseline cigarette consumption was reported as 165 cigarettes per week. He attended seven sessions (Sessions 3, 4, 6, 7, 8, 9 and 10). By session 4, he reported being only somewhat motivated, but he had greatly reduced his cigarette intake to only 15 per week. At Session 6, he reported only 7 cigarettes for the week and at each subsequent session he reported 0 cigarette use. At group completion, the youth indicated he was highly motivated to quit smoking. Interestingly, at Session 4 (i.e.while reducing), he reported feeling anxiety, irritability and trouble concentrating- the latter of which was the most severe. However the youth did not endorse experiencing a high level of withdrawal symptoms at subsequent sessions, and was abstinent from session 7 onwards. .

There were no students who reported having zero baseline motivation who subsequently *quit* smoking; however one student who reported zero baseline motivation *reduced* his cigarette consumption by at least 90% by the end of the program. At baseline, while his motivation was zero, his quit plan indicated that he did want to quit in the next 6 months. His baseline cigarette consumption was 160 cigarettes per week. He attended five sessions of the Quit 2 Win program (Sessions 1,3,4,7 and 10). Throughout the program, his motivation level increased though it never exceeded “somewhat” motivated. However with each successive session, his cigarette intake reduced until he reached his end count of 12 cigarettes per week. His CO level also reduced across the sessions. (See table 4) This student experienced withdrawal symptoms throughout the course of the program. The most commonly reported symptom was the desire to smoke, followed by depressed mood. The youth also endorsed feeling moderate levels of anxiety, irritability and increased hunger. Perhaps the presence of moderate to severe withdrawal symptoms impacted his motivation levels, and subsequently his inability to quit smoking.

There were seven other students reporting only slight motivation who also managed to reduce their consumption by more than 90%. These cases suggest that even if youth report that they are not highly motivated to stop using tobacco at the onset, participation in the Youth Quit 2 Win program can increase motivation levels throughout the duration of the program and have a positive impact in reducing their tobacco use. Overall, participants’ motivation significantly increased throughout the course of the program ($p<.01$).

Table 4. Example of an individual student's tobacco use and CO progress throughout program participation

	CPW	CO
Assessment	160	13
Session 1	140	13
Session 3	100	19
Session 4	65	9
Session 7	30	2
Session 10	12	6

As expected, final motivation levels were found to be associated with the final reports of cigarette consumption. Similarly, and in accordance to the literature (Dino et al., 2004), those who reportedly quit were more likely to have had a final motivation level of very or extremely motivated, which was higher than those who did not successfully quit. There was no significant difference in baseline motivation between those who quit and those who did not, nor was beginning motivation found to be significantly associated with final CPW. While it may be possible to have positive effects on those with little motivation, the program is not ideal for youth who are not yet thinking about quitting. Group facilitators must also consider the impact unmotivated participants have on other group members. Unmotivated youth might have attended group to get out of a class, or to socialize with friends. They did not contribute much social support to their peers who wanted to quit and instead caused distractions and disruption for others. One facilitator ended the group two sessions early (Session 8) noting that students were not taking the group seriously and it was frustrating those who were genuinely trying to quit smoking.

As for withdrawal symptoms, there was an unexpected relationship between tobacco consumption and withdrawal symptoms. Surprisingly, participants in the Youth Quit 2 Win program reported that as their cigarette consumption decreased over the course of the program, withdrawal symptoms *also* decreased. The Youth Quit 2 Win program may in part be responsible for the reduction in withdrawal symptoms as facilitators and fellow group members offer ideas on how to cope and deal with trigger situations. However, without a control group, it is difficult to attribute this to the program. It is also possible to speculate that the correlation between symptoms and tobacco consumption may be a result of youth giving what they believed to be socially desirable answers. If students are informed that their symptoms should decrease over time, they might then give answers accordingly. In addition, being in a group setting, where their information may not be completely anonymous to their classmates and teachers may have impacted their answers on the questionnaire, again giving what they consider to be socially desirable answers (Sudman, 2001). Another possibility is that the decrease in reported withdrawal symptoms might be an effect of repeating the same survey over a period of time, where the participants, perhaps fatigued or frustrated with the repetitive task of answering the same questions each session, begin to give more neutral answers so that they don't have to think about the questions before answering. A final possibility is that perhaps these youth were not as dependent on cigarettes to begin with and

cited the need for cigarettes based on what is socially expected of cigarette smokers instead of dependence.

The program is designed for those students who are motivated to quit smoking (i.e. youth who want to stop smoking in the next 30 days). In many cases these students have tried to quit on their own and were not able. Educating youth on various tobacco related issues seemed to have helped increase student motivation to significantly cut down on their tobacco use or quit totally. The young people appeared to appreciate the support and structure of the group as evidenced when asked what helped them refrain from smoking, and they responded that the group support and learning coping “life” skills were the main factors.

In addition to lacking a control group, limitations to the study include a small, non-ethnically diverse sample from a single state (New Jersey). In addition, not every facilitator ran each group in exactly the same manner due to school policies, time constraints, student involvement and personal circumstances. Further, as expected in a school setting, many students were unable to complete all sessions as they were absent, or unable to be excused from classes to attend the group. Other students may have felt competent in their ability to stop using cigarettes and stopped coming to group after a couple of weeks of refraining from tobacco use. Drop-out rates are also a concern as they contribute to the small sample size, though similar to other studies, more than half of the students completed the full program (Sussman, Lichtman, Ritt and Pallonen, 1999). (Students who dropped out before Session 5/Quit Day were not included in any analyses). In addition, though the program was intended only for students who were motivated to stop smoking, students who reported “slight” or “no” motivation to change were included.

The surprising decrease in nicotine withdrawal symptoms as participants significantly reduced their cigarette use over the course of the program suggests that the pattern of nicotine withdrawal in adolescents may differ from adults. Further research should explore this relationship.

Conclusion 2005-6

The design and preliminary findings of Youth Quit2Win are consistent with those of a recent review of smoking cessation interventions for adolescents which found that youth smoking cessation programs “increase the probability of quitting by approximately 46% (9.14% vs. 6.24%). Relatively higher quit rates were found in programs that included a motivation enhancement component, cognitive-behavioral techniques, and social influence approaches. Also, relatively higher quit rates were found in school-based clinic and classroom modalities. Furthermore, relatively higher quit rates were found for programs consisting of at least 5 quit sessions.” (Sussman, Sun and Dent, 2006).

Further, the data collected so far for Youth Quit2Win has shown that the program can be implemented by existing school staff after receiving the two-day training and a manual. Additional studies, including randomization to a control group and longer term follow up of participants, are needed to fully evaluate this and most other cessations interventions for adolescents. However, the Youth Quit 2 Win program shows promise in that it appeared to be

successful in maintaining motivation levels, resulting in 31% of participants reducing their cigarette consumption by at least 90%, and 14% quit completely by the end of the program.

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