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Effectiveness of smoking cessation program for male adolescents in South Korea ☆

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ABSTRACT

The objective of this study was to implement and verify the effectiveness of a smoking cessation program based on a cognitive behavioral model, composed of six sessions. Participants included 80 male middle school students who smoked. They were divided into experimental (n = 35 students) and comparison (n = 45 students) groups, and the smoking cessation program was conducted in the experimental group. Results of self-report scales for smoking behaviors and urinary cotinine and CO levels before and after the program were statistically analyzed with mixed regression including factors for group, time, and a group-by-time interaction. The results indicated that the group effect, time effect, and group-by-time interaction effect were significant for the nicotine dependency. The variation patterns in the two groups became significantly different over time as nicotine dependency drastically decreased in the experimental group, whereas those in the comparison group showed little change from pre-program examination to post-program examination. Significant time effects were observed for smoking cessation efficacy and urinary cotinine levels, reflecting increased smoking cessation efficacy and decreased cotinine levels in both groups across time. The results suggest that this six-week smoking cessation program in male adolescents in South Korea was valid to implement.

1. Introduction

Smoking is one of the major health problems in the world and contributes to cancer, cardiovascular disease, and respiratory diseases (Leshner, 1998). Individuals who smoke are most likely to have started and established a smoking habit during adolescence. More than 80% of adult smokers begin smoking before the age of 18 years (Substance Abuse & Mental Health Services Administration, 2009). Those who start smoking during adolescence show a greater degree of nicotine dependency than do those who start smoking as adults (U.S. Department of Health & Human Services, 1994).

In Korea, the number of teenagers who smoke has been increasing, and the age at which they start decreased from an average of 15 years in 1998 to 12.9 years in 2007 (Korean Ministry of Health, Welfare and Family Affairs et al., 2008). According to the 5th National Online Survey on Adolescent Health Status by the Korean Ministry of Health, Welfare and Family Affairs et al. (2010), lifelong smoking experience rates were 34.2% and 19.7% and current smoking rates were 17.4% and 7.6% in Korean boys and girls, respectively. Furthermore, average age of smoking onset was 13.1 years, and the percentage of those smokers 16 years of age or younger in South Korea has been on the rise, increasing from 10.3% in 2005 to 10.7% in 2006 and 12.8% in 2009 (Korean Ministry of Health, Welfare, & Family Affairs, et al., 2010).

It has not been surprising that the smoking cessation rates in adolescent smokers has been low, even though many adolescents wish to stop smoking (Institute for Health Promotion, Graduate School of Public Health in Yonsei University, & Korean Association of Smoking, & Health, 2008; Lim, 2007). A study published by the Korean Association of Smoking and Health (2006) indicates that 71% of male adolescent smokers want to stop smoking. In the United States, the 2002 National Youth Tobacco Survey (Centers for Disease Control & Prevention [CDC], 2006) reported that a significant percentage of American teenage smokers (62.1% of high school smokers and 49.6% of middle school smokers) wished to quit smoking; however, fewer male students than female students had tried to quit. These survey results suggested a need for a smoking cessation program that focused on adolescents, and particularly on teenage boys.

Cognitive behavior therapy was introduced in the 1990s to treat depression and anxiety as well as abuse of alcohol, nicotine, and other drugs (Liese & Franz, 1996) and has also been widely used as a theoretical foundation for smoking cessation programs (Sykes & Marks, 2001; Thorndike, Friedman-Wheeler, & Haaga, 2006). The cognitive behavioral model encompasses a wide range of issues that

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can provide motivation for smoking cessation in relation to health, appearance, and athletic ability (Ridel, Robinson, Klesges, & McLatin-Allen, 2002). Most of all, many studies have suggested that smoking cessation programs should deal with motivation and intention to quit smoking. The stage of change construct has been a widely accepted framework that represents the intention and readiness to change smoking behavior (Anatchkova, Velicer, & Prochaska, 2006).

The relapse prevention model is a commonly used cognitive behavioral model. According to Marlatt and George (1984), this model assumes that people experience the positive feeling of self-control while maintaining abstinence; furthermore, the model focuses on the maintenance phase of the process of habit change. From this perspective, intervention techniques were designed to teach individuals how to effectively anticipate and cope with potential relapse situations. Risk factors associated with relapse include ability to manage stress, peer pressure, attitudes toward smoking, and ability to remain a nonsmoker (Balch et al., 2004; Ennett & Bauman, 1994).

The effectiveness of cognitive behavioral programs in adolescent smokers stems from the manner in which they provide adolescents with accurate knowledge concerning the harmful effects of smoking (Ryu, 2001); incorporate awareness of cognitive factors, such as distorted convictions about smoking and the low success rate for smoking cessation (Kim & Kwon, 2006); and help teenagers acquire techniques to refuse cigarettes when they are offered, relieve stress through ways other than smoking, establish self-control strategies, and improve problem-solving skills (Balch et al., 2004; Shin, 1997).

Han (2002) outlined specific techniques used in the cognitive behavioral program, including *self-monitoring*, *setting goals*, *strengthening oneself*, and *training to cope with various situations*. *Self-monitoring* involves cognitive restructuring related to identification of situations, clues, emotional states, and cognitive reasons that caused the desire to smoke; reduction of positive attitudes about smoking; and reinforcement of alternative actions. *Training to cope with various situations* has been the core of cognitive behavioral treatment, allowing participants to acquire practical techniques to fight the urge to smoke. In addition, relapse prevention, emotional management, and problem-solving skills have been used as techniques for smoking cessation programs based on the cognitive behavioral model (Han, 2002).

Moreover, cognitive behavioral programs for adolescents have been implemented successfully as group programs (Balch et al., 2004; Dino et al., 2001; Han, 2002; Ryu, 2001). A recent meta-analysis verified the effectiveness of 58 group programs for smoking cessation in American teenagers (Sussman, Sun, & Dent, 2006). A meta-analysis performed by McDonald, Colwell, Backinger, Husten, and Maule (2003) also claimed that the cognitive behavioral approach is most effective for a smoking cessation group program for adolescents. In Korea, individual and group cognitive behavioral programs have been performed for smoking cessation in adolescents. Meta-analysis (Kim, Park, & Park, 2008) that examined the effectiveness of programs for Korean teenagers indicated that programs based on the cognitive behavioral model are effective. Kim and Kwon (2006) found that an eight-month follow-up session of cognitive behavioral therapy was significantly effective in helping adolescents quit smoking.

Unfortunately, most previous studies on smoking cessation using cognitive behavioral programs have been cross-sectional and have examined outcomes based on self-reporting by participants. Therefore, this study aimed to develop a six-week smoking cessation program for Korean male adolescents by integrating the findings of previous studies

Table 1
Program overview.

Session	Specific program	Goals	Description	Method
Pre-program	Pre-test	·Assessment of smoking behavior and related variables	·Compilation of data regarding study subjects ·Pre-program examination	Self-administered questionnaire; CO level test; urine test for cotinine levels
1	Orientation group formation; smoking cessation education	·Understanding of the program and its goals	·Introduction of the program	
		·Building rapport between administrators and participants ·Providing accurate information and knowledge about the harmful effects of diseases caused by smoking	·Introduction of group members and setting of rules ·Warm-up games ·Smoking cessation class on harmful effects of smoking	Group work; education
2	Strengthening motivation; setting goals for quitting smoking	·Self-monitoring and reinforced motivation to quit smoking	·Provide students with the motivation to change by allowing them to assess the pros and cons of smoking and anticipate the changes from quitting smoking	Group work
		·Setting specific goals for quitting smoking	·Setting individual, specific, and practical goals	
3	Improving self-efficacy	·Identifying one's strengths and learning about available support	·Sharing stories of successful quitters ·Identifying strengths for quitting smoking ·Information on support from local community	Group work
4	Stress management	·Assessment of stressors and how to cope with stress ·Finding out and practicing positive ways to cope with stress	·Identifying what causes stress and sharing various ways to deal with stress ·Discussion on positive means of coping with stress ·Physical activities	Group work
5	Practicing quitting smoking	·Finding out practical ways to quit smoking ·Acquiring techniques to abstain from smoking	·Practicing ways to refuse cigarettes under various circumstances ·Acquiring and practicing ways to abstain from smoking	Role play
6	Measures for preventing relapse; program evaluation	·Pursuing and maintaining new lifestyle	·Identifying changes within oneself ·Plans for maintaining one's new identity/show of determination	Group work
		·Closing remarks and evaluation	·Program evaluation	
Post-program	Post-test	·Evaluation of the program's effects	·Post-program examination	Self-administered questionnaire; CO level test; urine test for cotinine levels