

# Factors Associated with Healthy Lifestyle Behaviors among Adolescents

Colleen M. McGovern, MPH, RN, Lisa K. Militello, PhD, MPH, RN, Kimberly J. Arcoleo, PhD, MPH, & Bernadette M. Melnyk, PhD, RN

## ABSTRACT

**Objective:** Guided by cognitive theory, this study tested an explanatory model for adolescents' beliefs, feelings, and healthy lifestyle behaviors and sex differences in these relationships.

Colleen McGovern, Doctoral Candidate and Graduate Research Associate, College of Nursing, The Ohio State University, Columbus, OH.

Lisa Militello, Assistant Professor, College of Nursing, The Ohio State University, Columbus, OH.

Kimberly Arcoleo, Associate Professor, Associate Dean for Research, Director, Center for Research Support, University of Rochester School of Nursing, Rochester, NY.

Bernadette Melnyk, Vice President for Health Promotion, University Chief Wellness Officer; Dean and Professor, College of Nursing; and Professor of Pediatrics and Psychiatry, College of Medicine, The Ohio State University, Columbus, OH.

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This study is registered at [www.clinicaltrials.gov](http://www.clinicaltrials.gov) NCT01704768.

Some of the data in this manuscript were presented at the Council for the Advancement of Nursing Science conference. No previous manuscripts have been published with the analyses from this study.

Correspondence: Colleen McGovern, MPH, RN, College of Nursing, The Ohio State University, 1585 Neil Avenue, Columbus, OH 43210; e-mail: [mcgovern.5@osu.edu](mailto:mcgovern.5@osu.edu)

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**Methods:** Structural equation modeling evaluated cross-sectional data from a healthy lifestyle program from 779 adolescents 14 through 17 years old.

**Results:** Theoretical relationships among thoughts, feelings, and behaviors were confirmed and sex differences identified. Thoughts had a direct effect on feelings and an indirect effect through feelings on healthy behaviors for both sexes. A direct effect from thoughts to behaviors existed for males only.

**Discussion:** Findings provide strong support for the thinking–feeling–behaving triangle for adolescents. To promote healthy lifestyle behaviors in adolescents, interventions should incorporate cognitive behavioral skills–building activities, strengthening healthy lifestyle beliefs, and enhancing positive health behaviors. *J Pediatr Health Care.* (2018) ■■■, ■■■■■.

## KEY WORDS

Adolescent physical and mental health, healthy lifestyle behaviors, cognitive behavior skills, path analysis

## BACKGROUND

Understanding factors that contribute to healthy lifestyle behaviors in adolescents is critical to the development of interventions needed to promote positive behaviors that can prevent negative physical and mental health outcomes, which may have lifelong implications. Cognitive theory (CT; Beck, 1979) is a model linking a person's thoughts to emotions and behaviors. The basic premise of CT is that an individual's emotions and behaviors are, in large part, determined by the way in which he or she thinks and appraises the world (Beck, 2011). Therefore, a person who has negative beliefs tends to have negative emotions and behave in negative ways (Beck, 1979; Lewinsohn, Clarke, Hops, & Andrews, 1990; Skinner, 1960). A form of psychotherapy, cognitive behavior therapy (CBT) builds on CT principles. In CBT, people learn specific skills to identify distorted thinking, modify beliefs, and change behaviors. Negative emotions and behaviors are

exacerbated when poor emotional regulation, problem-solving, and assertiveness skills are present.

CBT is recognized as a psychotherapy criterion standard for mild to moderate anxiety or depression (U.S. Department of Health and Human Services, National Institutes of Health, National Institute of Mental Health, 2015). Skills from CBT (e.g., cognitive reframing, goal setting, problem solving, behavior activation) have also been successfully used in behavior change interventions targeting health behaviors in adolescents (Beck, 2011; Hoying, Melnyk, & Arcoleo, 2016; Linardon, Wade, de la Piedad Garcia, & Brennan, 2017; Lock, 2015; Wilfley, Kolko, & Kass, 2011; Winkler, Dörsing, Rief, Shen, & Glombiewski, 2013). Le Grange, Lock, Agras, Bryson, and Jo (2015) implemented a CBT-based intervention for adolescents with an eating disorder that indicated a significant longitudinal reduction in binge/purge behaviors. Winkler et al. (2013) completed a meta-analysis for Internet addiction; CBT-based interventions had a larger effect size for a reduction in screen time and depression compared with other treatments in adults and adolescents.

Although there is a body of growing evidence to support CBT as an effective strategy to target improvements in mental health and healthy lifestyle behaviors in adolescents, less is known about how the relationships among thoughts, feelings, and healthy lifestyle behaviors function in adolescents. Furthermore, inherent developmental differences between adolescent males and females may influence the effects of behavior change interventions. For example, females have been recognized to be at higher risk for anxiety and depression compared with males (Altemus, Sarvaiya, & Epperson, 2014; Avenevoli, Swendsen, He, Burstein, & Merikangas, 2015). Reviews by Haynos and O'Donohue (2012) and Kaisari, Yannakoulia, and Panagiotakos (2013) reported that compared with males, females had slightly more favorable outcomes to interventions to increase healthy lifestyle behaviors. Thus, a basic understanding of cognitive behavioral processes between sexes may inform how behavioral interventions are most likely to succeed (Haynos & O'Donohue, 2012; Melnyk et al., 2013, 2015; Tate, Spruijt-Metz, Pickering, & Pentz, 2015). Scalable interventions to increase healthy lifestyle behaviors should target this population to improve health outcomes during adolescence and into adulthood.

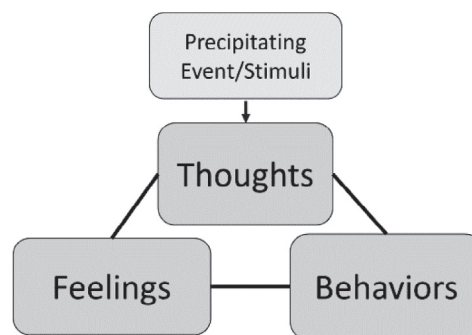
Guided by CT (Figure 1), the objectives of these secondary analyses were to test an explanatory model for the influence of adolescents' thoughts and feelings on healthy lifestyle behaviors and to investigate whether there are sex differences in these relationships.

## METHODS

### Ethics

The institutional review board for The Ohio State University reviewed and approved these secondary analyses.

**FIGURE 1.** The cognitive behavioral therapy model of how thoughts affect feelings and behaviors.



All participating universities and school districts approved the original study.

### Participants

Baseline measures from a longitudinal randomized controlled trial titled "Creating Opportunities for Personal Empowerment (COPE)" were used for this study (Melnyk et al., 2013, 2015). Urban and suburban high school teens ( $N = 779$ ) from 11 schools in two school districts from the Southwestern United States were included. Adolescents aged 14 through 17 years, primarily freshmen and sophomores, were recruited and enrolled from their required health education courses. Data were collected from January 2010 through December 2012.

### Measures

#### Healthy lifestyle beliefs scale

Healthy lifestyle beliefs were measured using the Healthy Lifestyles Beliefs scale (Melnyk, 2014; Melnyk & Moldenhauer, 2006). Previous studies show that this scale has acceptable reliability, with Cronbach's alpha equal to .89 (Melnyk et al., 2013). The Healthy Lifestyles Beliefs scale consists of 16 items with Likert-type responses ranging from 1 (*strongly disagree*) to 5 (*strongly agree*); higher scores indicate greater healthy lifestyle beliefs. Examples of questions include *I am sure I will do what is best to lead a healthy life*, *I am sure that I will do what is best to keep myself healthy*, and *I know what to do when things bother or upset me*.

#### Healthy lifestyle perceived difficulty scale

The Healthy Lifestyle Perceived Difficulty scale measures perceived difficulty in engaging in healthy lifestyle behaviors. It is a 12-item measure with Likert-type responses ranging from 1 (*very hard to do*) to 5 (*very easy to do*); higher scores reflect lower perceived difficulty. Examples of items include *How hard is it to exercise regularly?* and *How hard is it to take the time to help plan and prepare healthy meals?* Cronbach's alpha for this measure was .88 (Braet & Van Winckel, 2000).

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