



Empower U: Effectiveness of an Adolescent Outreach and Prevention Program With Sixth-Grade Boys and Girls: A Pilot Study

Sharon Dowdy PhD, RN^a, Maria Alvarado RN, BSN^b, Olive Atieno RN, BSN^b, Susan Barker RN, BSN^b, Sandra Barrett RN, BSN^b, Anna Carlton RN, BSN^b, Ginny Cheshire RN, BSN^b, Melissa Cooper RN, BSN^b, Crystal Eastridge RN, BSN^{b,*}, Shaylon Grant RN, BSN^b, Stefanie McHenry RN, BSN^b, Kendra Methvin RN, BSN^b, Sherry Murray RN, BSN^b, Amy Ratcliff RN, BSN^b, Catherine Reynolds RN, BSN^b, Abigail Scott RN, BSN^b, Sherry Tidwell RN, BSN^b, Jessica Turley RN, BSN^b, Lance Williamson RN, BSN^b

^a*School of Nursing, Belmont University, Nashville, TN*

^b*Belmont University, Gordon E. Inman College of Health Sciences, Nashville, TN*

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Sixth graders are at a prime age to modify behaviors and beliefs regarding exercise, nutrition, body image, and smoking. Empower U was created to change knowledge, beliefs, and behaviors regarding these topics. This pilot study utilized pre/post assessments of 58 sixth graders from a private middle school in the midsouth. Results showed a significant increase in self-esteem as well as in exercise and nutrition knowledge and beliefs at posttest and a significant increase in body image as well as in self-reported exercise and nutrition behaviors at the 1-month follow-up. Empower U provides nurses with an effective educational program that may be useful in positively impacting health behaviors.

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PREADOLESCENT BOYS AND girls may benefit from innovative education about exercise, nutrition, body image, and smoking to help them establish healthy lifestyle patterns that will continue throughout their lives. Research has demonstrated that increasing children's physical activity has important implications for preventing obesity

later in life, reducing coronary heart disease (CHD), and decreasing risk of depression while enhancing body image (Cohen, Mansoor, Langut, & Lorber, 2007; Dishman et al., 2006; Duncan, Al-Nakeeb, & Nevill, 2009; Janz et al., 2002; Thomas, Cooper, Williams, Baker, & Davies, 2007). Girls who are physically active perform better academically and have higher self-esteem and self-worth compared with their more sedentary counterparts (DeBate, Gabriel, Zwald, Huberty, & Zhang, 2009). Furthermore, increased nutrition knowledge has been shown to impact food choices and behaviors in preadolescents (Fahlman, Dake, McCaughy, & Martin, 2008). Children as young as 6

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* Corresponding author: Crystal Eastridge, RN, BSN.

E-mail address: crystal.eastridge@gmail.com (C. Eastridge).

years have attempted to diet to achieve a thinner body; this dissatisfaction with physical appearance may be associated with later development of low self-esteem in the preadolescent years (Dohnt & Tiggemann, 2006). In addition, in 2006, approximately 6% of middle school-aged children were smokers (Centers for Disease Control and Prevention [CDC], 2009a, 2009b). The leading cause of preventable death in the United States is cigarette smoking, with almost all first uses of smoking occurring before age 18 years (CDC, 2007).

Empower U is a preadolescent outreach and prevention program designed to improve four key health-related behaviors: exercise, nutrition, body image, and smoking behaviors. Empower U was adapted from the GirlForce community-based program (Vanderbilt University Medical Center, 1998, 2003), with permission from the GirlForce creator, for use in this study. In the GirlForce program, girls in a private southeastern middle school were tested on the four key health-related behaviors 1 week before, 1 week after, and 1 month following the 1-day program consisting of four 25-minute sessions, each addressing a different health behavior. Significant improvements in the areas of body image and physical activity were found in this unpublished study of the GirlForce intervention (Bonhert, Dyer, & McDonald, 2001), suggesting that brief group-based interventions may be effective during preadolescence. In contrast, the Empower U program includes both male and female preadolescents and consists of 45-minute educational and participatory interventions on the four health behaviors, with one area being covered each week over a 4-week period.

Review of the Literature

The need for children to get more exercise and to increase physical activity is evident in the literature today. A cross-sectional study of fatness, physical activity, and television viewing during the adiposity rebound period in 467 children, 4 to 6 years old, demonstrated that minutes spent watching television and performing vigorous physical activity were the variables most associated with body fatness (Janz et al., 2002). Janz et al. suggested that increasing vigorous physical activity during the years of the adiposity rebound period may play a role in reducing obesity later in life. Thomas et al. (2007) found a significant, inverse relationship between aerobic fitness and fatness in 12- and 13-year-old school children and that fatness was an independent predictor of triglyceride levels and blood pressure, which are CHD risk factors.

Exercise and increased physical activity are beneficial not only for reducing fatness and CHD risk factors but also for improving psychological well-being (Marsh & Redmayne, 1994). Duncan et al. (2009) studied 34 boys and 34 girls, aged 10 to 11 years, and showed that a 6-week circuit-based training intervention significantly improved body image

scores and decreased body mass index compared with the control group immediately postintervention; however, these results were not sustained at the 6-week postintervention evaluation. Burgess, Grogan, and Burwitz (2006) studied 50 adolescent (13–14 years) females and found that participation in a 6-week aerobic dance intervention significantly reduced body dissatisfaction and improved positive body image perceptions; these results were also not sustained at follow-up. Duncan et al. (2009) suggest that the lack of sustainable results may be because of a single exercise intervention rather than combined interventions including nutrition and exercise. Another possible explanation for the lack of sustainable results may be because of the rapid physical changes that are occurring during preadolescence.

Other aspects besides exercise may affect the health of preadolescents, including nutrition. Studies show that although education may increase knowledge about better food choices, the impact on changes in behavior is unclear. Allen, Taylor, and Kuiper (2007) found that food choices were influenced by nutrition education in 10 adolescents. Self-reported postintervention food choices were significantly healthier compared with preintervention choices (Allen et al., 2007); however, self-reported food choices may not reflect actual behavior change. A pilot study of the impact of the Michigan Model Nutrition Curriculum on nutrition knowledge, efficacy expectations, and eating behaviors of 576 middle school students showed that the intervention group had significantly more nutritional knowledge post-intervention than preintervention but, again, no reported change in behavior (Fahlman et al., 2008).

Exercise, nutrition, and body image frequently interconnect; therefore, the three variables are often studied simultaneously. A study of eighty-four 10–12-year-olds receiving an 8-week physical activity and nutrition intervention found that participants in the intervention group did not have significant improvement regarding their negative self-perceptions of body dissatisfaction, drive for thinness, and weight concerns (Gehrman, Hovell, Sallis, & Keating, 2006). However, another study by Huang, Norman, Zabinski, Calfas, and Patrick (2007) examined the relationship of body image and self-esteem after a behavioral intervention, which targeted physical activity, sedentary activity, and dietary behaviors of 657 adolescents. The findings suggest that girls in the intervention group who had a weight reduction or a weight maintenance experienced improvements in body image satisfaction compared with ones who had weight gain, even though there were no overall intervention effects on self-esteem or body image (Huang et al., 2007).

A study by DeBate et al. (2009) focused on the short-term effects of The Girls on the Run and The Girls on Track programs. The results of those developmentally focused youth programs showed statistically significant changes in self-esteem, body size satisfaction, and physical activity frequency, with commitment to physical activity approaching significance (DeBate et al., 2009). Melnyk et al. (2009) conducted a pilot study with Hispanic adolescents to

determine the short-term efficacy of the Creating Opportunities for Personal Empowerment Healthy Lifestyles Thinking, Emotions, Exercise, and Nutrition program on physical and mental health outcomes. Healthy lifestyle choices and depressive symptoms improved from baseline to postintervention in the intervention group, with improvements in health knowledge and beliefs in a subset of overweight adolescents who received the intervention (Melnyk et al., 2009).

Another important facet affecting preadolescent health is smoking behaviors. Although overall childhood smoking rates have decreased, many youth continue to use tobacco products, thus demonstrating the need for continued tobacco education. A tobacco prevention program for children was conducted with 201 students aged 9–15 years, showing an increase in knowledge about the health risks from pretest to posttest (Smith, Talley, Hubbard, & Winn, 2008). Tingen et al. (2006) looked at the effects of a theory-driven tobacco prevention program in sixth-grade children with significantly higher knowledge about smoking, lower smoking attitude, and higher ability to say “no” on the posttest compared with the pretest.

Many studies have been conducted with preadolescent boys and/or girls on one or more of the variables: exercise, nutrition, body image, and smoking abstinence. Studies that examined physical activity, nutrition, and body image are available (DeBate et al., 2009; Gehrman et al., 2006; Huang et al., 2007), but no research studies were found that incorporated all four variables within the target age group. Because exercise, nutrition, body image, and smoking have serious implications for the health of young preadolescents and because no published studies have been conducted looking at all four variables, the following study was conducted.

Theoretical Framework

Borzekowski’s (2009) suggestion to combine the theoretical approaches of Piaget, Vygotsky, and Freire can be used to guide teaching strategies for changing health behaviors of children and adolescents. Piaget’s well-known cognitive development theory suggests that learning takes place in a sequential, linear order, with the individual learning by exploring and interacting with the environment (Wills & McEwen, 2011). In Piaget’s concrete operational stage (ages 7 through 11 years), learning is attained by applying known rules and knowledge in new situations. Students encounter new information, changes their thinking based on the new information in light of their previous knowledge, and then reequilibrates their understanding after incorporating the new information. Students with ages 11 to 16 years, who are in Piaget’s formal operational stage, are able to think abstractly and can make logical choices between alternatives (Borzekowski, 2009).

According to Vygotsky, cognitive development can also be affected by social interactions. In the school setting, students can be provided with assistance or “scaffolding” by peers or adults to master a new topic or skill, using the edge of their current understanding or “zone of proximal development” to facilitate learning (Borzekowski, 2009, p. S286). The addition of Freire’s theory suggests interaction rather than passive learning to encourage critical thinking within the student’s cultural context by allowing dialog and reflection (Borzekowski, 2009). The high level of active involvement of the student with the new information facilitates personal transformation, which should affect beliefs about health and encourage change in health behaviors. According to these theories, providing information in an interactional format that is based on the students’ previous knowledge, using principles of simple to complex, and beginning with concrete examples to develop abstract concepts should expand the knowledge of preadolescents from previous understanding to a new level of knowledge, with subsequent improvement in their beliefs and behaviors. The goal of Empower U is to provide factual information in the four areas to influence the children to make healthier lifestyle decisions.

Purpose

The purpose of this study was to determine if the intervention (Empower U) yields positive changes in exercise, nutrition, and body image and promotes smoking abstinence in preadolescents. We propose posttest changes at 1 and 4 weeks following the Empower U program. Based upon the combined theories of Piaget, Vygotsky, and Freire, we propose that participants will have increased scores on their exercise and nutrition knowledge, beliefs, and behavior; improved scores on their attitudes toward body image and self-esteem; and less smoking behaviors.

Methods

A private, religiously based, K-12 school in a large metropolitan area located in the southeastern United States was conveniently selected for this pilot study using a one-group, pre- and posttest design. Students who attended this school were predominantly Caucasian and represented the middle to upper-middle socioeconomic level. Sixty-three male and female sixth-grade students were registered for an enrichment course consisting of four separate classes led by the school’s guidance counselor, with class sizes of 9, 15, 19, and 20 students. Group divisions were based on the students’ homeroom assignment. Recruitment took place through an informational session for these students and an informational

letter sent home to their parents, which included a health-screening questionnaire, a parental consent, and a student assent form. In order to participate in this study, students had to be actively enrolled in the sixth grade and have no health conditions listed on the health-screening questionnaire.

Of the 63 eligible students, 58 male and female participants, with ages ranging from 10 to 13 years ($M = 11.62$, $SD = 0.56$), were included in the study (Table 1). Students were excluded from the study if they did not return a parental consent and student assent form ($n = 3$), if they missed more than one educational session ($n = 1$), or if they missed any testing session ($n = 1$).

Two students missed one educational session each and were included in the study. No health-related problems were disclosed that limited any student from the intervention. The school's guidance counselor offered an alternative activity in another location for those who were not participating in the study.

The intervention took place from September thru October 2010 and was conducted by 19 graduate nursing students as part of a research class. Researchers provided the participants with pretests consisting of combined instruments to measure the four areas of interest, followed by administration of separate lessons that occurred over the course of 4 weeks. Lessons contained information about exercise, nutrition, self-esteem and body image, and smoking prevention. One week postintervention and 4 weeks later for follow-up, participants were administered with the same combined instrument.

After researchers reviewed informed consents and health-screening questionnaires, study participants were identified. Participants were initially given a pretest consisting of six combined instruments concerning their personal knowledge, attitudes, and behaviors of exercise, nutrition, self-esteem/body image, and smoking. Interventions consisted of group presentations taught by the graduate nursing students assigned to each of the lesson topics. After each lesson was prepared, the lesson was presented in its entirety to the graduate class to review for consistency, adherence to theoretical principles, age-appropriate content, language, and presentation before offering the information to the participants in class. Each

individual topic was presented by the same nursing student group in a 45-minute session to all four classes within the same week.

The exercise intervention consisted of a 20-minute educational session regarding forms of exercise, intensity levels, proper nutrition and hydration for increased exercise activities, and health benefits. A poster depicting pre-adolescents at five different levels of physical exertion (Vanderbilt University Medical Center, 1998) was presented to participants with an explanation of each of the different levels. The groups then took part in exercise sets consisting of a 5-minute warm-up session, 15 minutes of exercises at different levels of intensity, and a 5-minute cooldown session. Study participants were asked after each set of exercises to rate their level of exertion according to the scale to monitor exercise tolerance.

The nutritional intervention included a presentation and teaching from researchers about the food pyramid (U.S. Department of Agriculture, Center for Nutrition Policy and Promotion, 2005); instructions for reading food labels, counting calories, and determining daily requirements; the food groups; and healthy food choices. Participants were assessed for prior nutritional knowledge during group question-and-answer sessions prior to intervention. Participants then took part in an interactive relay game developed by the researchers where different food items were matched to their corresponding food group.

The intervention regarding self-esteem and body image was conducted via slide show about societal views of male and female attractiveness through different eras in history followed by group discussion led by researchers. Acceptance of thoughts and ideas about different styles and standards of beauty was reinforced by researchers. Researchers also supported discussion regarding media influence on societal ideals of beauty through television, movies, magazines, and music (Brausch & Muehlenkamp, 2007).

The smoking intervention included a 2-minute video based on current public health information, created by the researchers, depicting the consequences of smoking from a health perspective. A body diagram representing various organ systems negatively affected by tobacco smoke was presented to study participants. Participants were encouraged to share personal experiences with the use of tobacco and relate how media and peer and family pressures influenced their personal beliefs, attitudes, and behaviors about smoking.

Posttesting regarding the participants' knowledge, attitudes, and behaviors was given approximately 1 week after the last intervention. An identical follow-up testing battery was conducted approximately 1 month after posttest administration. Efforts toward standardization of teaching and testing procedures included inclusion of all presenters and evaluators in planning, presentation practice before class sessions, leader appointment for each class session and data collection period, and debriefing after each student encounter.

Table 1 Demographic Data ($N = 58$)

	<i>n</i> (%)
Gender	
Male	33 (56.9)
Female	25 (43.1)
Age in years	
10	1 (1.7)
11	21 (36.2)
12	35 (60.4)
13	1 (1.7)

Instruments

The exercise and nutrition knowledge instrument is a 21-item questionnaire that measures knowledge regarding benefits of exercise, types of exercise, food nutritional information, portion sizes, and eating habits (Melnyk et al., 2009). Scores range from 0 to 21, with 21 indicating all correct answers. Reliability and validity have been previously established (Melnyk et al., 2009). The Cronbach's alpha in this study was .80.

The Healthy Living Beliefs Scale is a 15-item instrument adapted from other belief scales used by Melnyk et al. (2006) in prior studies to assess beliefs about various facets (i.e., nutrition and exercise) of maintaining a healthy lifestyle. A higher score on the scale indicates a stronger belief in maintaining a healthy lifestyle. Possible scores range from 0 to 30 for the summed items. Validity and reliability have been previously established (Melnyk et al., 2006; Melnyk et al., 2009). The Cronbach's alpha in this study was .85.

The Healthy Lifestyle Choices Scale (HLCS) is a 16-item instrument that assesses behaviors about nutrition and exercise to maintain a healthy lifestyle. Possible scores range from 0 to 32 for the summed items. A higher score on the scale indicates an increase in the participation of healthy lifestyle behaviors. The instrument was originated by Melnyk et al. (2006), who previously established reliability and validity (Melnyk et al., 2009). The Cronbach's alpha was .75 in this study.

The Body Investment Scale (BIS) is a 24-item Likert scale instrument with four subscales, one of which is the body image feelings and attitudes, with 6 items that measure perceived love and expression for the body. Possible scores range from 6 to 30, with a higher score indicating more positive feelings about the body. This 6-item subscale was used to measure the students' attitudes regarding their body image. The 6-item subscale of the BIS has an acceptable internal consistency reliability (Orbach & Mikulincer, 1998; Osman et al., 2010) and very good known-groups validity and construct validity (Fischer & Corcoran, 2007, p. 440). The Cronbach's alpha in this study was .82.

The Rosenberg Self-Esteem Scale (RSE) is a 10-item instrument that was used in this study to assess self-esteem. The instrument originated from Rosenberg in 1965 (Fischer & Corcoran, 2007, p. 595). Possible scores range from 10 to 40, with a higher score indicating a lower self-esteem. The RSE has been shown to be reliable and valid for use with preadolescent and adolescent samples (Fischer & Corcoran, 2007, p. 595; Shutz, Paxton, & Wertheim, 2002; Keery, van den Berg, & Thompson, 2004). The Cronbach's alpha in this study was .82.

The national Youth Risk Behavior Surveillance System (YRBS) is a 50-item instrument developed by the CDC (2009a, 2009b). Eight multiple-choice questions from the YRBS were used to assess smoking behaviors. The questions determined whether cigarettes, chewing tobacco, or cigars had been used and, if so, how often in the last 30 days. The

CDC has previously conducted two test-retest reliability studies of the national YRBS questionnaire (CDC, 2009a, 2009b). Although no study has been conducted to assess the validity of all self-reported behaviors that are included on the YRBS questionnaire, the CDC conducted a review of existing empirical literature and determined that, although self-reports of these types of behaviors are affected by both cognitive and situational factors, these factors do not threaten the validity of self-reports of either type of behavior (Brener, Billy, & Grady, 2003; CDC, 2004).

Results

A paired *t* test was used to evaluate the relationship between the pre- and posttest scores of the participants' knowledge, beliefs, and behaviors toward exercise and nutrition. The knowledge scores indicated that the participants had some previous knowledge of nutrition and exercise at baseline ($M = 11.98$, $SD = 4.17$); however, scores increased significantly at posttest ($M = 16.00$, $SD = 3.04$) and follow-up ($M = 16.16$, $SD = 3.40$; Table 2). The results of the paired *t* test indicated that the students' exercise and nutrition knowledge scores significantly increased from pretest to posttest, $t(56) = -9.32$, $p < .00$, and were maintained from posttest to follow-up. The belief scores indicated that participants had a moderately high level of nutrition and exercise beliefs at baseline ($M = 23.43$, $SD = 4.98$; Table 2). The results of the paired *t* test also showed that the students' belief scores significantly increased from pretest to posttest, $t(44) = -5.05$, $p < .00$, and were maintained from posttest to follow-up. The behavior scores indicated that they had a moderately high level of nutrition and exercise behaviors at baseline (Table 2). No significant increase was noted in the scores on their nutritional and exercise behaviors from pretest to posttests, but significant improvements in behaviors were noted from posttest to follow-up scores, $t(52) = -3.10$, $p < .00$.

Table 2 Exercise, Nutrition, Body Image and Self-Esteem Scores

Scale (Min–Max)	Pretest, <i>M</i> (<i>SD</i>)	Posttest, <i>M</i> (<i>SD</i>)	Follow-up, <i>M</i> (<i>SD</i>)
Exercise/Nutrition knowledge (0–21)	11.98 (4.17)	16.00 (3.04)	16.16 (3.40)
Exercise/Nutrition belief (0–30)	23.43 (4.98)	26.29 (3.37)	26.46 (4.25)
Exercise/Nutrition behavior (0–32)	20.52 (4.59)	21.11 (4.72)	22.16 (4.34)
Attitude toward body image (6–30)	26.45 (4.18)	26.33 (4.58)	27.48 (2.61)
Level of self-esteem* (10–40)	16.11 (4.78)	14.89 (4.60)	14.86 (4.35)

* Lower scores indicate higher self-esteem.

A paired *t* test was used to evaluate the relationship between the pre- and posttest scores of the participants' attitudes toward body image and the participants' level of self-esteem. The body image scores indicated that the students had high positive attitudes toward their body image at baseline (Table 2). The self-esteem scores also indicated high levels of self-esteem at baseline (Table 2). Paired *t* test results showed that there was no significant improvement from the pre- to posttest but significant improvements from posttest to follow-up scores of the students' attitudes toward body image, $t(55) = -2.51, p < .02$. A significant improvement in self-esteem from pretest to posttest scores was noted, $t(55) = 2.17, p < .05$. The improvement in self-esteem scores was maintained through the follow-up testing period (Table 3).

Preintervention testing for smoking behavior showed that 100% of the participants had not used or experimented with tobacco products. The pretest smoking scores indicated that they had a high baseline level of understanding of the effects of smoking. Test results were unchanged from pretest to posttest and from posttest to follow-up testing.

Discussion

The Empower U program was designed to be an interactive educational series to promote active learning. The goals were to positively influence knowledge, beliefs, and behaviors regarding exercise and nutrition, body image and self-esteem attitudes, and smoking abstinence in the preadolescents involved in the program. Exercise and nutrition knowledge, beliefs, and behaviors showed significant improvement after completion of the Empower U program, suggesting that the intervention is useful in positively impacting health behaviors. These findings are consistent with improvements in nutrition knowledge and healthy lifestyle choices and beliefs found in a study of older teens (mean age = 15.5 years) by Melnyk et al. (2009). These

findings offer support for Borzekowski's (2009) use of the theoretical approaches of Piaget, Vygotsky, and Freire in developing educational programs to improve healthy behaviors. Offering scaffolding in the form of teaching, which begins with previous knowledge; moving from concrete to abstract principles; and encouraging personal interaction in a supportive environment affect knowledge development in preadolescents, with subsequent change in health beliefs and behaviors.

Body image scores improved from posttest to follow-up; self-esteem scores improved from pretest to posttest and were maintained through follow-up testing, suggesting that an age-appropriate intervention, such as Empower U, can positively impact body image and self-esteem. This is consistent with the findings of DeBate et al. (2009), who found that age-appropriate programs involving active physical activity intervention had positive effects on the self-esteem of girls with ages 8–13 years. In this study, both boys and girls showed significant improvement in self-esteem scores. When self-esteem was examined separately by gender in this study, nonsignificant results were attained, which could indicate that self-esteem was not affected by gender or that gender differences were not seen because of the smaller sample size when split into groups by gender.

Although Smith et al. (2008) found that about 12% of middle school students report smoking behaviors, pretest data in this study revealed that none of the participants reported smoking behaviors in the previous 30 days. The lack of smoking behavior in this study may be because of the relatively high socioeconomic level that may exist in a private, religiously based school.

Because the site was a private, religiously based school with a homogenous sample of preadolescents enrolled in an enrichment course, factors such as socioeconomic status and educational level of parents may have inflated the scores on all study variables. All data were based on self-report measures; therefore, results need to be interpreted cautiously. Some of the participants verbalized concern about their identity being discovered despite reassurances of privacy. Hence, response-set bias is a possible limitation. Further, the convenience sample and lack of random sampling limited the generalizability of this study.

The Empower U study design was a descriptive pilot study with no control group; a study design utilizing both an intervention with the same Empower U interventions and a control group is necessary to have higher confidence in the program and to establish causal relationships between the interventions and the outcomes. Presentation of this intervention to other groups of preadolescents, especially those in public schools, those from lower socioeconomic groups, and those who have had less exposure to health education, may be beneficial. A longitudinal study to track changes in behavior would be informative to determine sustainability of improvements in health behaviors.

Table 3 Results of Paired *t* Tests

Scale	Pre- to Posttest			Posttest to Follow-up		
	<i>t</i>	<i>df</i>	<i>p</i>	<i>t</i>	<i>df</i>	<i>p</i>
Exercise/Nutrition knowledge	-9.32	56	.00 [†]	-0.48	56	.63
Exercise/Nutrition belief	-5.05	44	.00 [†]	-1.40	49	.17
Exercise/Nutrition behavior	-1.67	48	.10	-3.10	52	.00 [†]
Attitude toward body image	0.37	53	.72	-2.51	55	.02*
Level of self-esteem	2.17	55	.04*	0.15	55	.88

* $p < .05$.

[†] $p < .00$.

The internal consistency reliability of the instruments in this study of preadolescents was slightly lower overall than the reported Cronbach's alpha values in the literature. In general, the instruments were developed for adolescents ranging in age from 12 to 18 years and used with those age ranges in the literature. The age of the present sample is 10 to 13 years, making this sample slightly younger, which may have affected the reliability values. All reliability coefficients of the instruments used in this study were greater than .80 except for the HLCS, which had an alpha of .75. This value suggests that the instruments, especially the HLCS, should be evaluated further or modified for use with the younger age group of preadolescents.

Nurses play a critical role in the health education of communities. As nurses have a role in educating and screening for important preadolescent behaviors and practices, they are in a unique position to intervene with educational programs. School nurses in particular can influence health curriculum in the school setting.

The results of this one-group, pilot study using self-report measures indicated that the targeted, interactive, and age-appropriate teaching interventions of the Empower U program positively impacted the knowledge and behaviors of a sample of preadolescents in the important areas of nutrition, exercise, body image, and self-esteem. The Empower U program should be further tested using a more heterogeneous sample and a stronger research design including a control group to determine its usefulness as an effective method to influence children with ages 10–13 years as they develop lifelong eating and exercise habits. Because of the limitations of the study design, the results of the study are considered preliminary. However, further study is warranted based on the findings of this pilot study.

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