

The method of delivery of nutrition and physical activity information may play a role in eliciting behavior changes in adolescents

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Received 16 September 2005; received in revised form 27 January 2006; accepted 27 January 2006

Abstract

Objectives: Motivating adolescents to adopt proper nutrition and physical activity behaviors is important in this nation's fight to prevent obesity and chronic diseases. This study was conducted to determine which health education delivery method would elicit a greater behavior change.

Method: The intervention was conducted in three schools (control, computer-based, and traditional education).

Results: Students who received the computer-based intervention showed increased knowledge ($p < 0.001$), physical activity ($p = 0.001$), self-efficacy ($p < 0.001$), and social support ($p < 0.001$), and decreased meals skipped ($p < 0.001$).

Conclusion: The computer-based group showed more positive behavior changes. However, future programs may be enhanced by including group discussion and individual feedback.

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Keywords: Adolescents; Nutrition; Physical activity patterns; Overweight and obesity; Dietary behaviors

1. Introduction

It is well documented that several chronic diseases, major causes of morbidity and mortality in the US, have their roots in a person's younger years (CDC, 2003). Behavioral patterns established during adolescence are likely to influence long-term health behavior and may have a tremendous impact on life-long health (Hoelscher, Evans, Parcel, & Kelder, 2002).

Obesity is currently considered the most prevalent nutritional disease of children and adolescents in the United States (Dietz, 1998). An estimated 66% of obese children have one or more unfavorable cardiovascular risk factor (Diabetesincontrol.com, 2005). Fatty streaks, elevated total cholesterol, reduced HDL, calcifications in the aorta and coronary arteries, and elevated blood pressure, all risk factors for cardiovascular disease, have been recently noted among children and adolescents (Freedman, Dietz, Srinivasan, & Berensen, 1999). Paralleling the incidence of childhood obesity, type 2 diabetes is increasingly noted in young children and may also be associated with the development of cardiovascular diseases and other chronic diseases in adulthood (Fagot-Campagna, Saaddine, Flegal, & Beckles, 2001).

Excesses and imbalances of nutrients have become the target for improving the health of adolescents in the US. The CDC reports that over 60% of young people eat higher than the recommended amount of fat while only 34% of boys and

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33% of girls consume the suggested 5 a day servings of fruits and vegetables (CDC, 2003). Nearly 25% of the calories adolescents consume are from high fat, low nutritional value foods such as french fries, deep-fried foods, candy, and cookies (HP2010, 2000; Jacobsen, 2005). Moreover, it is estimated that 66% of girls and 73% of boys consume more than 10% of their calories from saturated fat (Boreham & Riddoch, 2001). An additional 25% of calories are estimated to come from the consumption of low nutrient density beverages such as soft drinks (Jacobsen, 2005; Phillippas and Lo, 2005).

Despite their natural tendencies, children have become less physically active in recent decades and expend approximately 600kcal less per day than children 50 years ago (Boreham & Riddoch, 2001). The CDC estimates that less than 50% of adolescents are physically active on a regular basis, with a sharp decline in activity from childhood noted (CDC, 2003). An estimated 20% of adolescents do not engage in any leisure time physical activity (CDC, 2004).

In order to improve the health of the adolescent population, effective programs/interventions focused on modifying unhealthy lifestyle behaviors are needed (ADA, 2003; Hoelscher et al., 2002; Lytle, 2002). Improvements in dietary patterns have the potential to positively influence risk factors for chronic disease such as body weight, blood lipid levels, and glucose homeostasis. Making physical activity part of a daily or weekly routine is also a strong predictor of long-term weight management (ADA, 2003). Regular physical activity in teens and adolescents has been shown to benefit strength and aerobic endurance, bone mass and density, blood glucose regulation, and reduce body fat (Foreyt, 1999). The question that remains, however, is *how* to motivate adolescents to adopt healthy behaviors to improve their health status.

Research indicates that nutrition education is more likely to be effective when it is behaviorally focused. Contento, Balch, and Bronner (1995) suggests three components of successful dietary interventions: the cognitive, the affective, and the behavioral. The cognitive component focuses on providing pertinent information and concurrent health messages. The affective component addresses beliefs, attitudes, and perceptions associated with healthy lifestyle behaviors. Using this approach, tips and strategies for making behavior change are provided. The behavioral component focuses specifically on the change process, goal setting, skill building, incentives, and readiness (Contento et al., 1995). This approach empowers individuals to take responsibility for the choices they make. The participant creates actions aimed at a healthy lifestyle including: dietary improvement, incorporation of physical activity, and weight management.

To be most effective the information must have relevance to the individual student, and students must be able to integrate the information into their own lifestyle (Achterberg & Miller, 2004). This is often difficult to accomplish using standard printed material and traditional education methods. Computer-based education can provide a powerful medium because programs cannot only be tailored to the individual, which allows for a more comprehensive approach to behavior change, but the information can be accessed quickly, around the clock, at a low-cost without geographic barriers (Brug, Oenema, & Campbell, 2003; Oenema, Tan, & Brug, 2005; Probst & Tapsell, 2005). In addition, learners are able to access and assimilate information at their own pace and have an experience that is enjoyable, exciting, and effective (Kreisel, 2004).

The financial burden associated with obesity and the precursors to chronic disease developed in adolescence have the potential to surpass our ability as a nation to treat these complications. The purpose of this study was to compare the outcomes of two delivery methods for health education programs to determine if either was an effective strategy to elicit adoption of a healthier lifestyle by adolescents. The specific questions to be answered were: Will the method of delivery result in a greater behavior change in terms of:

- movement toward a healthy body weight for height, as measured by BMI
- Improvement of dietary habits as demonstrated by 24-h recalls and food frequency questionnaire.
- An increase in physical activity level, as measured by a validated physical activity questionnaire.
- an increase in knowledge
- an increase in perceived self-efficacy regarding dietary and physical activity habits
- an increase in perceived social support

2. Methods

The Institutional Review Board at Florida International University and the research sector of the School Board of Broward County approved the study. The administration of the selected schools granted permission for the research to be conducted at their site. Students and parents signed informed consent prior to initiation of the study.

The attainment of a sufficient sample size while maintaining the integrity of the study design in this population incurs issues with consent as well as confidentiality, especially since research review boards consider the adolescent population

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