

# Preventing Childhood and Adolescent Obesity: Interventions Utilizing an Ecological Model

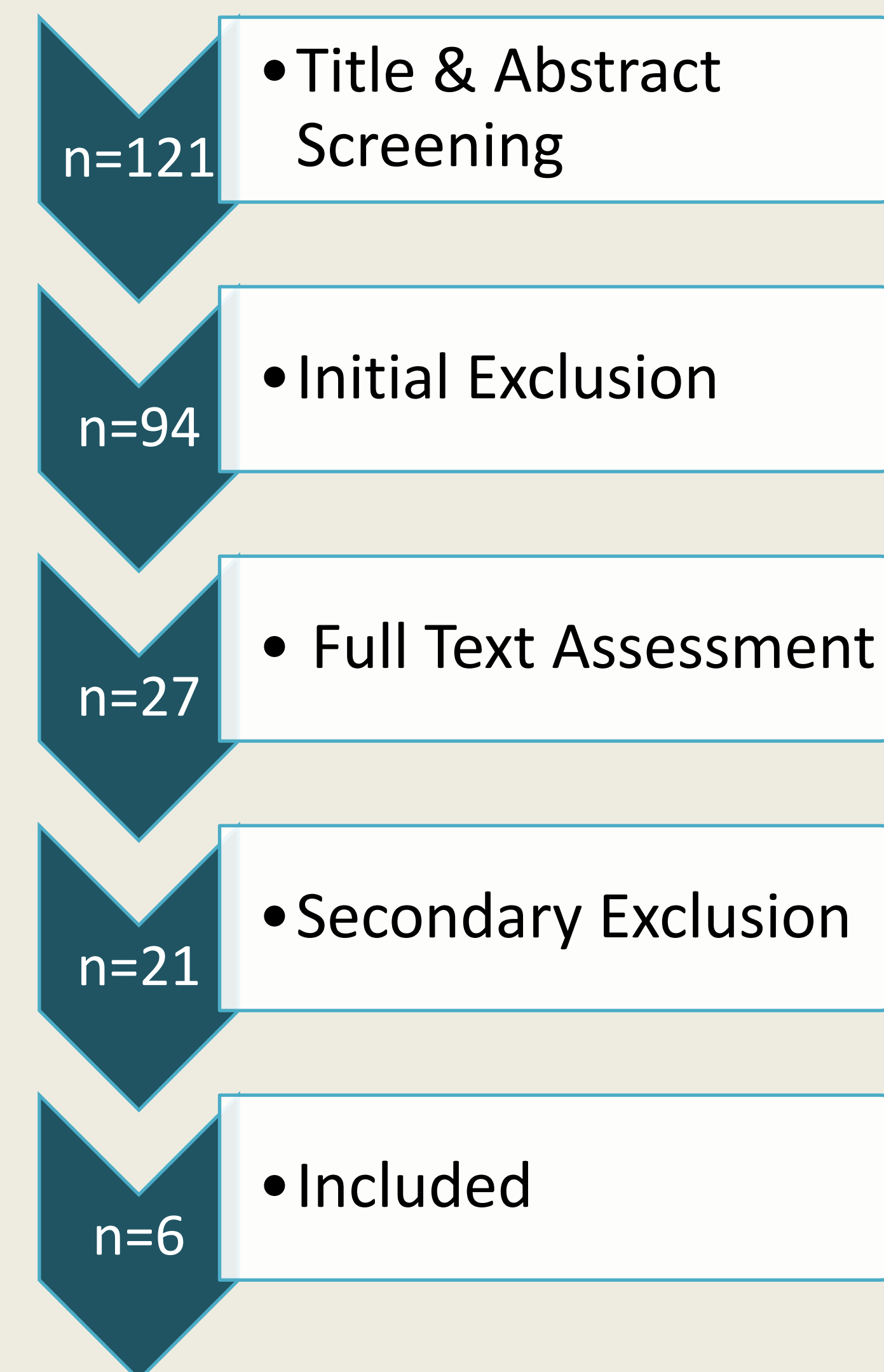
Bethany Tennant, M.S. & Michael Stellingson, Ph.D.

University of Florida, Gainesville, FL

## Abstract

**Introduction:** Childhood obesity is a leading health indicator and is recognized as a national health concern. Rates of childhood obesity continue to rise as a result of a complex number of factors. Recently, *Healthy People 2020* explicated the need for research utilizing multi-level approaches to identifying and addressing determinants of childhood and adolescent obesity. Ecological approaches consider individual and interpersonal characteristics, as well as broader community and societal determinants as interdependent influences on health behaviors. **Purpose:** The purpose of this presentation is to highlight findings from a critical review assessing the effectiveness of interventions designed using an ecological approach for preventing childhood and adolescent obesity. **Methods:** A critical review of the literature was conducted to locate peer-reviewed research articles describing multi-level (ecological) childhood and adolescent obesity prevention programs between 1995 and 2010. Inclusion criteria required studies to focus on school-aged children and/or adolescents participating in a physical activity and/or dietary intervention designed specifically or implicitly using a multi-level (ecological) approach to inform intervention activities. Studies that intervened at less than three levels, were implemented outside the United States, or that targeted multiple co-morbidities outside of obesity prevention were excluded. **Results:** After accounting for conditions outlined by inclusion and exclusion criteria, only six (n = 6) studies were retained. While all six obesity prevention interventions used multiple dimensions and various combinations of the social ecological model, improvements in measured health outcomes was limited. Most notably, none of the studies reported a decrease in overall body fat percentage or body mass index following intervention. The reviewed studies did, however, report several moderate changes in several obesity prevention health behaviors. **Conclusion:** To address the numerous factors that place a child at risk for becoming overweight, change must occur on multiple levels. Unfortunately, interventions using an ecological model have achieved only modest success in combating childhood and adolescent obesity. While multi-level interventions aimed at personal, social, environmental, and political factors can be successful in the prevention of childhood and adolescent obesity they are still in their infancy and require further development and evaluation to determine which program components are essential for success.

## Methods



Author(s) (year) Project Name	Individual	Interpersonal/ Family	Organizational/ School	Community	Society
Caballero (2004) <i>Pathways</i>	Education to encourage healthy eating and increased physical activity	Family fun nights, family educational packets and workshops	Guidelines and support for food service to reduce the % of calories from fat and increase the use of lower fat foods, fruits, and vegetables		
DeBate et al. (2009) <i>VERB™ Summer Scorecard</i>	Encouraged tweens to monitor their own physical activity with program scorecards		Businesses, schools, and local groups partnered to provide access to activities (swimming, sports clinics, roller skating, dance classes, and paint ball)	Built community capacity and collective efficacy with community partners	
Eisenmann et al. (2008); Gentile et al. (2009) <i>SWITCH</i>	Education and activities to enhance knowledge and skills about physical activity and nutrition	Monthly packets for children and parents including activities, calendars, and meal planners	School wide messages and activities to promote <i>SWITCH</i>	Community awareness campaign to increase awareness and knowledge about preventing childhood obesity	
Perry et al. (1997); Nader et al. (1999) <i>CATCH</i>	Education to increase knowledge and skills regarding dietary habits, and physical activity	Families were involved in skill-building activity packets and <i>Family Fun Nights</i>	<i>Eat Smart</i> school food service program was implemented to provide reduced fat and low sodium meals; Increase in the amount of MTV physical activity at school		
Ward et al. (2006) <i>LEAP</i>	Curriculum was added to provide participants with knowledge and physical skills for physically active lifestyles	Assignments were given to child and adolescent participants that encouraged parental involvement.	Displayed announcements, print materials; school nurses were used to encourage and support physical activity; physically active staff and faculty served as role models for participants	Provided participants with information regarding physical activity opportunities in the community	
Webber et al. (2008) <i>TAAG</i>	Health education to enhance behavioral skills and encourage self-monitoring		Increased activity during physical education classes, school wide messages promoting physical activity for all girls	Partnerships with local health clubs and community recreation centers to offer After-school step-aerobics class, basketball camp, weekend canoeing programs	

## Results

Pathways	Reduce body fat percentages among participants.	<ul style="list-style-type: none"> <li>Significant reduction in total energy intake, percent of calories derived from fat</li> <li>Increase in knowledge and behaviors related to healthy lifestyle</li> <li>No reduction was found in percent body fat or BMI in participants compared to the controls.</li> </ul>
VERB™ Summer Scorecard	Increase physical activity among participants.	<ul style="list-style-type: none"> <li>Participation was significantly related to meeting recommendations for vigorous physical activity, being physically active on the weekends, and more days of trying a new game or activity.</li> </ul>
SWITCH	Increase amount of physical activity and fruit and vegetable consumption among participants, increase community awareness	<ul style="list-style-type: none"> <li>Significant increase in self-reported fruit and vegetable consumption.</li> <li>There were no significant effects on pedometer measure of physical activity or body mass index of participants.</li> </ul>
CATCH	Targeted dietary behaviors, physical activity, and smoking.	<ul style="list-style-type: none"> <li>At the three year follow-up lower daily energy intake from fat, higher self-reported daily vigorous activity, and higher dietary knowledge and intentions as compared to the control group.</li> <li>No significant differences were found for social support for physical activity, smoking behavior, blood pressure, cholesterol levels, or body mass index.</li> </ul>
LEAP	Increase physical activity among participants.	<ul style="list-style-type: none"> <li>Regular vigorous physical activity 8% greater in the intervention schools than in the control group.</li> <li>Incidence of overweight and obese in the girls who received the intervention did not decrease.</li> </ul>
TAAG	Increase physical activity among participants.	<ul style="list-style-type: none"> <li>More physically active than girls in controls school</li> <li>No differences were found in fitness or percent body fat as a result of the intervention.</li> </ul>

## Discussion

- The effectiveness of the reviewed interventions was limited.
- While multi-level interventions aimed at personal, social, and environmental factors have been recommended to address the obesity epidemic, results from this review suggest that programs are in their infancy and present many challenges for future research.
- To bring about behavior change, interventions must focus on understanding each target group, tailoring programs to fit individual needs, and addressing the environmental context in which children live and make choices.
- Attempts could have been made advocating for change in a variety of societal areas such as the food and beverage industry, media, food production policies, economic systems, and land use.
- Addressing all levels of a comprehensive social ecological model within a single intervention is challenging and even more challenging to evaluate
- Ecological models and approaches to childhood and adolescent obesity still require further development and evaluation to determine what constitutes an effective application.