A school-based internet obesity prevention program: Development, evaluation, and implementation

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Objectives

• To describe the development of two school-based internet obesity prevention programs
• To describe results of RCT comparing the effectiveness of two school-based internet obesity prevention programs
• To discuss program implementation
• To discuss lessons learned
Prevalence of obesity in youth

- Prevalence of obesity in youth has increased dramatically since 1970 – approximately 18% (CDC, 2008)
- Black and Hispanic youth have higher risk
Health consequences of obesity

- Asthma
- Hypertension, hyperlipidemia
- Type 2 diabetes
- Low self-esteem
- Stigma
- Depression
Why school-based?

• Existing infrastructure for health promotion education
• Ability to reach youth of diverse race/ethnicity and income
• Can be supplemented with school-wide policies and procedures to promote healthy eating and PA
Why internet?

- Program content is standardized
- Decreased burden to teachers and schools
- Youth are technology adopters
- Technology has potential to be engaging
Development of Program

1. Developed program outline based on previous adolescent internet and obesity programs (TeenCope, Tween)
2. Conducted focus groups with teens and teachers
3. Designed prototype
4. Obtained feedback from teens and teachers on prototype using “think-a-loud” method
5. Revised website
6. Implemented clinical trial
## Theoretical Components

<table>
<thead>
<tr>
<th>Theoretical Component</th>
<th>Health [e] Teen Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interactive education</td>
<td>Lessons on healthy eating, physical activity, and sedentary behavior</td>
</tr>
<tr>
<td></td>
<td>Interactive self-assessments, problem-solving, individualized feedback</td>
</tr>
<tr>
<td>Social learning theory</td>
<td>Self-monitoring and goal setting</td>
</tr>
<tr>
<td>Skill development</td>
<td>Reality TV concept</td>
</tr>
<tr>
<td>Social modeling</td>
<td>Interaction with peers/moderator</td>
</tr>
<tr>
<td>Social networking</td>
<td></td>
</tr>
<tr>
<td>Social learning theory</td>
<td>Lessons on coping skills training</td>
</tr>
<tr>
<td>Moderation of psychological response</td>
<td></td>
</tr>
</tbody>
</table>
HEALTH [e] TEEN

EAT HEALTHY. GET MOVING. MAKE IT YOUR REALITY.
Lessons

Interactive education, self-monitoring, goal setting, social modeling, social networking

8 Lessons:
- Nutrition
- Healthy Eating
- Metabolism
- Physical Activity
- Sedentary Behavior
- Portion Control

4 Extra Lessons:
- Stress Management
- Problem Solving
- Communication
- Conflict Resolution
Fast Food, Eating Out, And Special Occasions

Making the most out of eating out while learning how to make great choices.

Start Lesson >

The Cast Reacts To This Lesson

Be sure to mouseover each cast with every new lesson. Their responses change.

Shateac | Bio  Blair | Bio  Devin | Bio
Dorrie | Bio  Molly | Bio  Jessie | Bio

Coach's Latest Blog

Fast Food Face Off!

“Fast food is a part of everyone’s life whether we like to admit it or not.”

Read more >
Mental Benefits Of Exercise

Getting exercise to help you prevent health problems in the future may not motivate you to be physically active. Did you know that exercise can improve your mental health and help you feel better?

How do you feel after physical activity or exercise?

"Wow! I didn't know all that. I get stressed easily...maybe I should think about doing something after school with my friends."
Click the appropriate button that best describes your health behaviors. Earn star power over time by making small changes to improve your health!

<table>
<thead>
<tr>
<th>Activity</th>
<th>No days</th>
<th>Some days</th>
<th>Most days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ate 2-3 pieces fruit</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ate 2-3 servings vegetables</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ate breakfast</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ate junk food</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ate fast food</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Exercised at least 30 minutes</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Getting Started

An important way to improve your nutrition and physical activity is to set goals. So, select a goal...or create your own goal. We suggest that you pick 1-2 Healthy Eating Goals and 1-2 Physical Activity Goals to start.

Keeping Track

Then, keep track of your progress each time you log in to this site. Select ‘Active’ if you are still working on your goal. Select ‘Completed’ if you have accomplished your goal. Yay! Select ‘No longer interested’ if you want to try something new.

Healthy Eating Goals

Select Goal: Eat 1–2 pieces of fruit every day
Active: Active

Create Goal
Active: Active

Active Goals

Completed Goals

“Make sure your goals are SPECIFIC and REALISTIC!”
An Internet Obesity Prevention Program for Adolescents

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Keywords: Obesity; Prevention; Adolescents; Internet

ABSTRACT

Purpose: To compare the effectiveness of two school-based internet obesity prevention programs for diverse adolescents on body mass index (BMI), health behaviors, and self-efficacy, and to explore moderators of program efficacy. It was hypothesized that the addition of coping skills training to a health education and behavioral support program would further enhance health outcomes.

Methods: A randomized clinical trial with cluster randomization by class and repeated measures with follow-up at 3 and 6 months was conducted (n = 384). BMI was assessed by use of standard procedures. Sedentary behavior, physical activity, nutrition behavior, self-efficacy, and satisfaction were assessed with self-report measures. Data analysis consisted of mixed model analyses with autoregressive covariance structure for repeated data by use of intent-to-treat procedures.

Results: The mean age of students was 15.31 years (± 0.65), with a mean BMI of 24.69 (± 5.58). The majority were girls (62%) and of diverse race/ethnicity (65% non-white). There were no significant differences between groups on any outcomes and no change in BMI over time. There were significant improvements in health behaviors (sedentary behavior, moderate and vigorous physical activity, healthy eating, fruit and vegetable intake, sugar beverages, and junk food intake) and self-efficacy. Gender and less completion moderated select health outcomes. There was excellent participation and high satisfaction with the programs.

Conclusions: School-based internet obesity prevention programs are appealing to adolescents and improve health behaviors. The differential effect of coping skills training may require longer follow-up.

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Clinical Trial

• To compare the effectiveness of HET compared to HET + CST on BMI, health behaviors, and self-efficacy
Clinical Trial

- Mixed-methods
- Cluster randomization
- Data collection (baseline, 3, and 6 months)
  - BMI
  - Health Behaviors (Nutrition, PA, Sedentary Behavior)
  - Self-efficacy
- Mixed effect model analysis with intent-to-treat procedures (adjusted for age, gender, race/ethnicity, ICC)
Procedures

- IRB and Board of Education approval
- Recruited from 3 schools
- Determination of program implementation
  - Classroom
  - Homework
- Informed consent
- Teacher training
Recruitment

- Approached: 604
  - Consented: 403
    - Did not meet inclusion criteria: 2
  - Not Consented: 201
    - Enrolled: 384
      - Did not participate: 17
    - Declined: 36
    - Passive Refusal: 165

- 3 month data collected: 372
- 6 month data collected: 366
Sample (n=384)

**Gender**
- Male: 38%
- Female: 62%

**Age**
- 14-15: 69%
- 16-17: 31%

**Grade**
- 9th: 93%
- 10th: 4%
- 11th: 2%
- 12th: 1%

**Race/Ethnicity**
- White non-Latino: 36%
- White Latino: 22%
- Black non-Latino: 23%
- Multiracial: 6%
- Other: 13%
Results

• No significant difference between HET and HET + CST on BMI, health behaviors, or self-efficacy

• Significant improvement in health behaviors and self-efficacy in both groups
  • Increase in fruit and vegetable intake, moderate and vigorous exercise, stretching exercise, self-efficacy for healthy eating and physical activity
  • Decrease in sugar drink intake, junk food, and sedentary behavior
Results

• No effect:
  • Strengthening exercise
  • Eating breakfast
  • Fast food
  • BMI
Conclusions

• Reached a diverse sample of adolescents
• Positive health outcomes of school-based internet obesity prevention program
• No additional effect of CST
Implementation of a School-based Internet Obesity Prevention Program for Adolescents

Robin Whittemore, PhD, APRN, FAAN; Ariana Chao, MSN, RN, FNP-BC; Myoungock Jang, MSN; Sangchoon Jeon, PhD; Tara Liptak, MPH; Rachel Popick, MSN, MPH, ACNP; Margaret Grey, DNP, RN, FAAN

ABSTRACT

Objective: To evaluate the reach, adoption, and implementation of HEALTH[e]TEEN, a school-based Internet obesity prevention program, and examine differences in student participation and satisfaction by school, gender, age, and race/ethnicity.

Design: Concurrent mixed method evaluation.

Setting: Three public high schools in Connecticut.

Participants: Three hundred eighty-four adolescents, 8 teachers.

Intervention(s): HEALTH[e]TEEN vs HEALTH[e]TEEN plus coping skills training.

Main Outcome Measured(s): Demographic and state-available data, measurements of student satisfaction and participation, interviews with school administrators and teachers.

Analysis: Mixed and logistic models, content analysis.

Results: The sample (n = 364) was diverse (35% white), with a mean age of 15.3 years and mean body mass index of 24.7 kg/m². Student participation (83% of lessons completed) and satisfaction (mean 3.6 out of 5) was high. Schools implementing the program in class had higher satisfaction and participation compared with schools that implemented the program as homework (P = .001 and < .001, respectively). Girls had higher satisfaction and participation compared with boys (P = .02 and .03, respectively). Younger students had higher participation compared with older students, but no difference in satisfaction was noted (P = .33).

Conclusions and Implications: Two school-based Internet programs to decrease obesity reached diverse adolescents, and were adopted and implemented with high student satisfaction and participation. Implementation of the intervention was influenced by setting (classroom vs homework), teacher characteristics, student age, and gender.

Key Words: adolescent, obesity, prevention, Internet, health (J Nutr Educ Behav. 2013; [1-9].

INTRODUCTION

In the United States, obesity among adolescents aged 12-19 years has more than tripled over the past 30 years, increasing from 3.6% in 1976 to over 18.4% in 2010.1 The increase in obesity rates is even more profound in minority adolescents, with obesity rates exceeding 20% for Latino and black adolescents.2 The alarming increase in obesity in youth has resulted in a marked rise in type 2 diabetes, hypertension, asthma, and depression in this age group.3,4

The primary strategy for decreasing the prevalence of childhood obesity is prevention, with schools representing a popular setting for obesity prevention programs.5,6 Whereas school-based obesity prevention programs are multifaceted and heterogeneous, the majority of programs provide curricular content aimed at increasing physical activity and improving dietary intake.7 Several meta-analyses and systematic reviews have been conducted on school-based obesity prevention programs and have indicated that most programs (> 75%) significantly improve knowledge, self-efficacy, and health behavior (physical activity and nutrition).8,9 However, effects on body mass index (BMI) have been inconsistent; some interventions demonstrated a decrease in BMI10,11 and others had no effect on BMI.12 This result may be explained by potential variations in the amount of behavioral change in youth across studies, inadequate power to detect differences between groups, and the challenges of evaluating BMI changes in programs of short duration, which may not allow for consideration of normal growth and development in youth or factors influencing intervention implementation.

School adoption and implementation of obesity prevention programs may affect BMI and health behavior outcomes in adolescents. However, schools have multiple curriculum
Program Implementation

• Little research on participation in school-based internet obesity prevention programs

• Participation
  • Decreases over time
  • Moderates outcomes

• Satisfaction has been variable
  • 34-67% report high satisfaction
  • Gender and age differences
Purpose

• To evaluate the implementation (participation & satisfaction) of a school-based internet obesity prevention program

• To evaluate differences in participation and satisfaction by school, gender, age, and race/ethnicity
Program Implementation

- 3 schools
  - 2 schools provided in class (Health and Biology)
  - 1 school provided as homework (Biology or Public Health)
- 35 classes
- 604 students participated in program
- 384 students participated in research
Participation & Satisfaction

• Participation
  • % Lessons complete
  • Logistic model with random effect of class

• Satisfaction
  • 6-item Satisfaction Survey (content, enjoyment, helpfulness, ability to navigate, practice content, how worthwhile)
  • Mixed model analysis with random effect of class (adjusted for age, gender, race/ethnicity, school)
Participation

- High participation
  - 83% of lessons completed across all students and schools
- Highest participation when program provided in Health class
- Girls had higher participation compared to boys
- Younger students had higher participation compared to older students
- No difference in participation by race/ethnicity
Satisfaction

- High satisfaction
  - Mean satisfaction score 3.6 (SD=0.5) out of 5
- Students who had program provided in class were more satisfied compared to students who completed the program for homework
- Girls had higher satisfaction compared to boys
- No difference in participation by age or race/ethnicity
Limitations

• Multiple statistical comparisons
• Small sample size in one school

• Other factors influencing participation and satisfaction were not measured

• Different procedures to deliver program in school.
Conclusion

- Successfully reached diverse adolescents
- Overall high participation and satisfaction
- Participation varied by school, age, and gender, but not race/ethnicity
- Satisfaction varied slightly by gender, but not school, age, or race/ethnicity
Lessons Learned

- School ‘champion’
- School internet procedures and equipment
- Research assistants comfortable with adolescents
- Teaching training
- More systematic evaluation of implementation
  - Teacher documentation
  - Program fidelity
- Further examine gender and age differences
Conclusion

• School-based internet obesity prevention programs have potential to be successful and widely disseminated
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