Boston University Initiative on Cities

BOSTON UNIVERSITY

Designing Public Health Interventions for the Town of Winthrop, MA

METROBRIDGE

About this Report

This report is a product of student work in Boston University's Obesity in Society course taught by Prof. Monica Wang in Fall 2019.

Acknowledgments

The MetroBridge program at Boston University's Initiative on Cities wishes to thank our partners in the Town of Winthrop -- especially Public Health Director Meredith Hurley – for their collaboration and support on this project.

About BU MetroBridge

MetroBridge empowers students across Boston University to tackle urban issues, and at the same time, helps city leaders confront key challenges. MetroBridge connects with local governments to understand their priorities, and then collaborates with Boston University faculty to translate each city's unique needs into course projects. Students in undergraduate and graduate classes engage in city projects as class assignments while working directly with local government leaders during the semester. The goal of MetroBridge is to mutually benefit both the Boston University community and local governments by expanding access to experiential learning and by providing tailored support to under-resourced cities. MetroBridge is funded by the College of Arts and Sciences and housed at Boston University's Initiative on Cities.

Table of Contents

Executive Summary

Childhood obesity is a growing concern in the City of Winthrop, where rates are consistently higher than the state average. Obesity in Winthrop has many determinants that affect healthy eating which include availability, accessibility, and affordability of healthy foods. Social determinants include the built environment and socioeconomic status. In regards to the built environment, the Town of Winthrop has a single local grocery store and no supermarkets; the store does not have an extensive inventory which leads to higher produce prices, and does not accept SNAP benefits. The town also has many convenience stores which is associated with higher obesity prevalence, particularly in adolescents. Socioeconomic status is another determinant of higher obesity rates. Low-income residents may be a greater risk for obesity because they have a limited ability to pay for more expensive produce.

Paper One

Three main objectives were laid out to be addressed the MetroBridge team's intervention. First to increase purchases of fruits and vegetables by increasing access to fresh produce; second to improve knowledge of healthy behaviors and nutritional literacy; third to improve the consumption of healthy foods; and fourth to reduce the childhood obesity rates within the town. Through the aid of a logic model to visualize a pathway for success, the team identified inputs, proposed activities, determined outputs, outcomes, and ultimately the impact of the intervention. The suggested intervention will lead to the achievement of the previously listed objectives.

The team proposes an intervention that consists of nutrition education classes combined with the creation of a community garden and local farmers' market. It will target elementary through middle school-aged children who are a part of a pre-existing after-school program. It would be implemented through the after-school program, which allows for flexibility, continuity, and greater access to low-income students as these programs are often inexpensive or subsidized. Community outreach will be the basis of a crowdfunding campaign in order to fund the intervention. Evaluation of the program will be conducted by facilitators of the afterschool program, comparing a group who participates in the intervention to a group that does not. Primary measures are Body Mass Index (BMI) and daily fruit and vegetable intake.

Paper Two

The main health objectives the MetroBridge team identifies is to first increase purchasing of health foods by at least 10% over the course of one year for the target population. The second objective is that the target population will increase consumption of the purchased foods by at least 10% over the course of one year, and finally to reduce overall obesity rates in Winthrop by at least 5% over a five-year period. Through the aid of a logic model, the team identified inputs, proposed activities, determined outputs, outcomes, and ultimately the impact of the intervention.

The MetroBridge team's intervention is a two-pronged program utilizing the abandoned middle school building. The building will be used to establish a year-round farmers' market to engage local farms and artists. A part of the building will also be renovated to be used for hockey and ice rink events which will increase offerings of town-centered events and attract more residents to participate in various activities. Numerous inputs are necessary for successful implementation of the two-pronged intervention, including human resources and community buy-in, physical resources, and

funding for the renovation of the hockey rink amenities. Once the initial inputs are established, not many additional resources will be needed to sustain the activities. Evaluation of the intervention will be conducted by the Winthrop Public Health Department with assistance from Boston University School of Public Health students who will aid in data collection in the form of both quantitative and qualitative questions. Primary measures include purchasing behavior, food consumption behavior, physical activity levels, and BMI.

Paper One: Obesity Intervention for Winthrop, MA

Kellcey Lesmerises, Carole Sioufi, and Susan Eichhorn

The Challenge

Meredith Hurley, the Director of the Winthrop Department of Public Health & Clinical Services, discussed the growing obesity concern, specifically the high childhood obesity prevalence, in Winthrop and the current barriers the city must overcome in order to implement a meaningful obesity prevention intervention. According to the results of the Body Mass Index (BMI) Screening in Massachusetts Public Schools, childhood obesity rates in the Town of Winthrop were consistently higher than the state average (Commonwealth of Massachusetts, 2017). The most striking difference was observed in first graders. In Winthrop, 35% of first graders were obese, but state prevalence of obesity was only 28% (Commonwealth of Massachusetts, 2017). Students in the fourth and seventh grades had the highest prevalence of obesity among all age groups at 37%, which was also higher than the Massachusetts average of 34% for these age groups (Commonwealth of Massachusetts, 2017).

Once presented with this issue, we as a group brainstormed different interventions that could positively impact the obesity issue, then focused on those that would be most appropriate for Winthrop. We also pursued strategies that could be integrated into already existing community programs and resources in order to increase the feasibility of the intervention. After finalizing our idea, we looked at other adolescent-centered projects throughout Massachusetts for implementation strategies to ensure this intervention would be effective.

For our proposed intervention, the primary target population is children and adolescents, specifically elementary and middle school students enrolled in grades kindergarten through 8th grade. Currently, there are little to no specific interventions designed for encouraging health behaviors in young children in the community. Children under 18 make up about one-fifth of Winthrop, so an intervention targeting this population could meaningfully address high obesity levels (US Department of Commerce, 2018). Additionally, there will be supporting community-based strategies with potential secondary impacts on older students, parents, and other community members.

Determinants of Obesity

Social determinants of obesity are the environmental and individual factors that impact health outcomes and influence disease risk. Any intervention recommendation should address these characteristics in order to have meaningful population level benefits. One major determinant of the high obesity prevalence in Winthrop is the built environment, specifically the low availability of grocery stores with fresh produce. Studies have demonstrated that a lack of grocery stores within a community is associated with higher obesity rates and less healthy diets, and currently, there is only one grocery store with fresh produce in Winthrop (Larson, Story, & Nelson, 2009). This research shows that grocery store availability is an important target for obesity prevention programs. In the absence of supermarkets, there are also several convenience stores throughout Winthrop, which research reveals is associated with higher obesity prevalence, especially in adolescents (Larson, Story, & Nelson, 2009).

Another determinant of higher obesity rates in Winthrop is socioeconomic status. The average household income is close to $100,000 and the median house value is roughly $430,000, both of which are significantly higher than the Massachusetts average household income and median home value of $74,167 and $357,600, respectively (US Department of Commerce, 2017). Despite the

high household income and property values, nearly 10% of the population still lives in poverty (US Department of Commerce, 2018). Trends have shown that obesity prevalence increases in lower income groups, so it is important that any obesity prevention strategy addresses this population (Ogden & Flegal, 2010). These low-income residents in Winthrop may be at greater risk for obesity because they do not have the same ability to pay for expensive produce at the local grocery store or have the means to travel to supermarkets outside of the neighborhood, leaving them with few alternatives to the convenience stores.

Objectives

The first objective of this intervention is to increase purchases of fruits and vegetables by increasing access to fresh produce in the neighborhood. After the first year of the intervention, sales of fruits and vegetables will increase for community members by 50%.

The second objective is to improve knowledge of healthy behaviors and nutritional literacy through increased health education initiatives targeted at children. Over the first 6 months of our intervention, scores on nutrition and healthy eating assessments should increase in children aged five to fourteen by 25%. Access to healthy foods alone is not enough to improve diets and likelihood of nutrition-oriented choices.

The third objective is to improve the consumption of healthy foods. After the first year of our intervention, self-reported daily consumption of fruits and vegetables should increase by 25% in children aged five to fourteen. Purchasing fresh produce is a necessary step to creating a healthier diet, but if the food is not actually consumed, it will not have a meaningful impact on health and obesity risk.

Our last objective is to reduce the high childhood obesity rates within the town. Five years after the intervention, we hope to see BMI prevalence in the obesity category reduced in children aged 5 to 14 years old by 5 percentage points.

Intervention

Overview of Intervention

Our proposed intervention consists of nutrition education classes combined with the establishment of a community garden and a local farmers' market. Our intervention will target children aged 5-14, i.e. elementary and middle school students and will be part of a pre-existing after-school program in Winthrop such as For Kids Only or 21st Century. Because it targets children, we expect the intervention to trigger a domino effect, and influence the eating behaviors of parents and the community. We chose a combined intervention because it improves dietary knowledge, induces healthier eating behaviors, increases interest in cooking, and promotes community building (Berezowitz et al., n.d.; Braunscheidel & Lachenmayr, 2010; DeCosta et al. 2017; Piscopo, 2016).

We decided to implement as part of an after-school program for it offers flexibility and continuity because they run after school and during school breaks, which would maximize the learning experience and reinforce healthy behaviors in the long run (Berkowitz et al., n.d.; School Health Guidelines, n.d.). After school programs are inexpensive and subsidized, making our program accessible to low-income students. They also facilitate the recruitment of volunteers and qualified personnel.

The farmers' market provides a marketplace for the community garden's produce. It complements our program by furthering education, specifically around healthy cooking practices, and helps us

engage the Winthrop community around the intervention. It also makes for a promising business model with potential revenues that could fund and sustain our program.

Funding is crucial for the establishment of our intervention, and community outreach is an especially effective means of raising funds (Burt et al. 2018; Nele et al. 2017). We will craft an online or social media crowdfunding campaign to encourage donations, including funds, materials, and equipment, for the establishment of the program. We also count on local ice-hockey star Mike Eruzione for his support in marketing the initiative and gathering state-wide attention. Additionally, we will devise sponsorship opportunities for local and Massachusetts-based corporations as part of their Corporate Social Responsibility goals. Eventually, we expect both the community garden and farmers' market to be self-sufficient and to generate enough revenues to fund the nutrition education program.

Implementation of Intervention

Children 5-14 years old in Winthrop receive limited nutrition education as part of their school health curriculum. The nutrition education program we suggest will comprise engaging, instructional methods and will focus on youth empowerment. At the elementary level, nutrition education increases the familiarity with and preference for eating vegetables (Growing Healthy Habits, 2015). At the middle school level, it improves the capacity to make more informed food choices (Sanaz et al., 2017). Our program will have clearly defined learning outcomes that revolve around healthy, local eating as well as learning assessment strategies and periodic evaluations (School Health Guidelines, n.d.). The Growing Healthy Habits curriculum that was piloted in Maryland in 2015 and the HGO! intervention that was piloted in Worcester in 2016 are useful models to draw from (Wang et al., 2016; Growing Healthy Habits, 2016). We will also leverage the nutrition material featured in the previous Wellness Weeks conducted in Winthrop. We plan to recruit qualified staff from the after-school and/or Wellness Week programs. We expect the program creation and training of the staff to be led by relevant faculty members in Boston University's Sargent College and/or Tufts' Friedman School.

The community garden's goal is to teach children how to grow and harvest produce throughout the year and familiarize themselves with fruits and vegetables. Such hands-on, multidisciplinary learning improves children's willingness to taste, ability to identify and self-efficacy to prepare and cook produce, and long-term eating behaviors (DeCosta et al. 2017; Davis et al., n.d.). It also enriches the social development of children, with benefits going beyond the school community (Berezowitz et al. n.d.; Utter et al. n.d.). The community garden will be set in the unused middle school during winter as a greenhouse with some indoor plants and in the adjacent Ingleside Park during spring, summer, and fall. The school is at walking distance from most schools in Winthrop, making it convenient for children to commute there after school and on weekends. Ingleside park is centrally-located, which would help us drive interest from the community. It is also large, which offers potential for large harvests, and affordable to rent.

We expect the garden to be run and managed by volunteers from the community, possibly high school students as well as parents and older members of the community with free time and experience in gardening. It is thus expected to increase community cohesion. Volunteers are an important component for sustaining programs, even when limited funding is available (School Health Guidelines, n.d.). To maximize the yield of the garden, we will invite local farmers and specialized growers to teach best practices. The community garden will be funded externally at first by donations. With time, we expect the sales of produce from the garden at the farmers' market to increase enough to allow for self-sufficiency.

The Farmers' Market will be established in Ingleside park and will run every Sunday. The demand for a Farmers' Market in the Town of Winthrop is validated and the model is feasible (the town ran a successful market for 5 years). We expect it to be run and managed by high school students who would volunteer to fulfill community work hours. The Farmers' Market will include a booth that sells the produce harvested from the community garden, with revenues used to sustain the garden's activities. The market will also include a cooking booth, highlighting a harvested produce of the week (from the garden), which is expected to increase the preference for vegetables among children (Davis et al. n.d.). This booth will be managed by members of the community, ideally from different ethnicities to increase exposure to diverse cuisines. In addition to booths for local farmers and other vendors that sell crafts, jewelry, or other self-made products, the market will include a health information booth, which would be managed by local physicians and health practitioners and offer informational pamphlets.

The Farmers' Market will be evaluated 6-months post-establishment and adjusted accordingly to ensure it fits our objectives. The program will run in pilot mode and then be adjusted for the final version. Although it will be crowdfunded at first, it has the potential to achieve self-sufficiency and generate profits and revitalize the local economy. By increasing access to healthy produce, food security will be addressed, which makes it more convenient for, specifically for the elderly population who have limited transportation, to source fresh produce.

We will kick-off our intervention with a 2-day local event featuring Mike Eruzione, 6 months after the implementation of our intervention, ideally in the spring or summer. The event will bring the community together around food, fun activities, and music. We expect it will help us increase awareness around our initiative and drive further donations and support. We hope to fund it with corporate sponsorship. The event will be marketed online and on social media and covered by the local media. All profits generated from the event will be used to further fund our intervention. If successful, we will host the event annually, which we hope drive tourism in Winthrop.

Logic Model

Our logic model presents the pathway in which our suggested interventions will lead to the achievement of our main objectives in the Winthrop community. The inputs (the investments and resources necessary for implementation of an intervention) include volunteer staff to support the community garden and Farmers' Market, funding for maintenance of these programs, space at the middle school and neighboring Ingleside Park to build the garden and hold the Farmers' Market, a health education curriculum to use in after-school programs, and the actual partnerships with existing after school programs. All of these are necessary for our projected activities, or the actual elements of the program. These events include delivery of health education in after school programs after training staff to grow the garden and holding a kick-off event after constructing the Farmers' Market. The outputs (what will occur if our intervention is successfully implemented) demonstrate specific attendance rates at after school programs and at the Farmers' Market kick-off event as well as the community garden growth.

Outcomes describe the desired effects of our intervention in the long and short-term if all of our outputs are accomplished. In the short-term, as a result of nutrition education courses, children's baseline knowledge of healthy behaviors will increase. Involving children in the production, harvesting, and cooking of the food has also been shown to make them more appreciative of the source of their food and of the quality, sustainability, and nutritional characteristics of fresh, local food (Piscopo, 2016). Once produce from the community garden is ready for purchase, it will be sold at the Farmers' Market, which will contribute to attendance rates at the weekly Farmers' Market.

Consistent traffic to the Farmers' Market will ultimately lead to increased purchases of produce, some of which may come from the community garden, by households in Winthrop.

These short-term outcomes will ultimately lead to our intermediate outcomes. We anticipate a rise in produce consumption as a result of increased purchases of produce and increased knowledge of nutritious dietary behaviors. Nutrition education has been shown to empower children of all ages to adopt healthier eating behaviors (Piscopo, 2016). Additionally, some studies found that an additional town supermarket was correlated with an 11% increase in fulfillment of recommended fruit and vegetable intake (Larson, Story, & Nelson, 2009). Increased purchases should also increase financial stability of the Farmers' Market due to increased revenue. Lastly, high attendance at the Farmers' Market, regardless of shopping habits, should increase community engagement. Ultimately, all of these outcomes will fulfill our major goals (lasting impacts) for the community of reduced childhood obesity rates increased profitability of local businesses, and increased economic revitalization.

Evaluation

Evaluation Design

An evaluation of the intervention will be performed by the facilitators of the afterschool program to track progress of the children participating every six months for the duration of the intervention. Data will be collected from a total sample of 90 children and intervention versus comparison groups will be selected via non-random assignment. Forty-five children will be participating in the after school program and 45 children will not be participating in the after school program, both groups will have five children for each of the nine grades in Winthrop schools.

The community garden and farmers market will also be evaluated for the duration of a one-year pilot by facilitators of the community garden and volunteers from the high school and community. After a six month period, the afterschool program participants will meet to determine next steps of evaluation that are appropriate for the farmers market moving forward, as we are expecting it to grow overtime.

Measures for Evaluation

The primary measures of interest for evaluation are BMI and daily fruit and vegetable intake of the children in both the intervention and comparison groups. Children will have their BMI measured by school nursing services and categorized using national standards of the four subcategories underweight, healthy, overweight and obese for each appropriate age group. Their daily fruit and vegetable intake, as well as other health behaviors and nutritional knowledge will be measured via the CATCH Kids Club Questionnaire. This questionnaire was chosen because it includes elements of nutritional literacy and education as well as gathering information about healthful food intake (www.nhlbi.nih.gov). The physical activity portion of the questionnaire was omitted as that is not a behavior directly addressed in our intervention. A sample of the questionnaire is provided in the appendix part B. Children will take the questionnaire in person at the initiation of the program or it will be sent home to be done with parents, which will be decided by the discretion of the teachers of the nutritional classes. Covariates collected via the survey include gender, age and grade. Students participating in the program and the comparison group will have repeated quantitative data collection, including BMI and survey, every six months until they age out of the program.

Secondary measures will be quantitative at the organizational level, measuring the sales of produce from the farmers market and the number of people visiting the nutrition and cooking booth.

Documentation of sales from the farmers market will be collected via a point-of-sale (POS) system that may be donated or rented from local companies or the school during the weekly farmers market

or documented by hand via the volunteers running the farmers market. We will document and compare produce harvested and sold on a weekly basis. We project an increase in sales over time due to larger harvest and increased market foot traffic, as well as community engagement. The health booth will be evaluated by number of visitors and pamphlets distributed weekly. This data will be collected weekly and at the end of the six-month pilot will be evaluated by the facilitators of the program. They will compare the cost of running the community garden with the revenue received from the farmers market. The farmers market will be year-round, with expected increase in involvement and sales during the summer months of May through September.

Success of the Intervention

Measuring Success

The success of the intervention will be defined by a decrease in the percentage of children that fall into the obese category for BMI, a reported increase in daily fruit and vegetable intake and overall score on the nutritional education survey. A secondary marker of success is the extent to which the farmers market can be self-sustaining and catalyze economic growth opportunities within the community. The results will be used to adjust the intervention as needed and possibly expand the farmers market and increase community/student involvement. We hope to see a subsequent impact of this program to increase access to healthful food for the Town of Winthrop and ultimately decrease obesity rates. Success of the farmers market will be determined if revenue is generated to cover the cost of running the community garden and after-school nutrition program.

Opportunities/Challenges

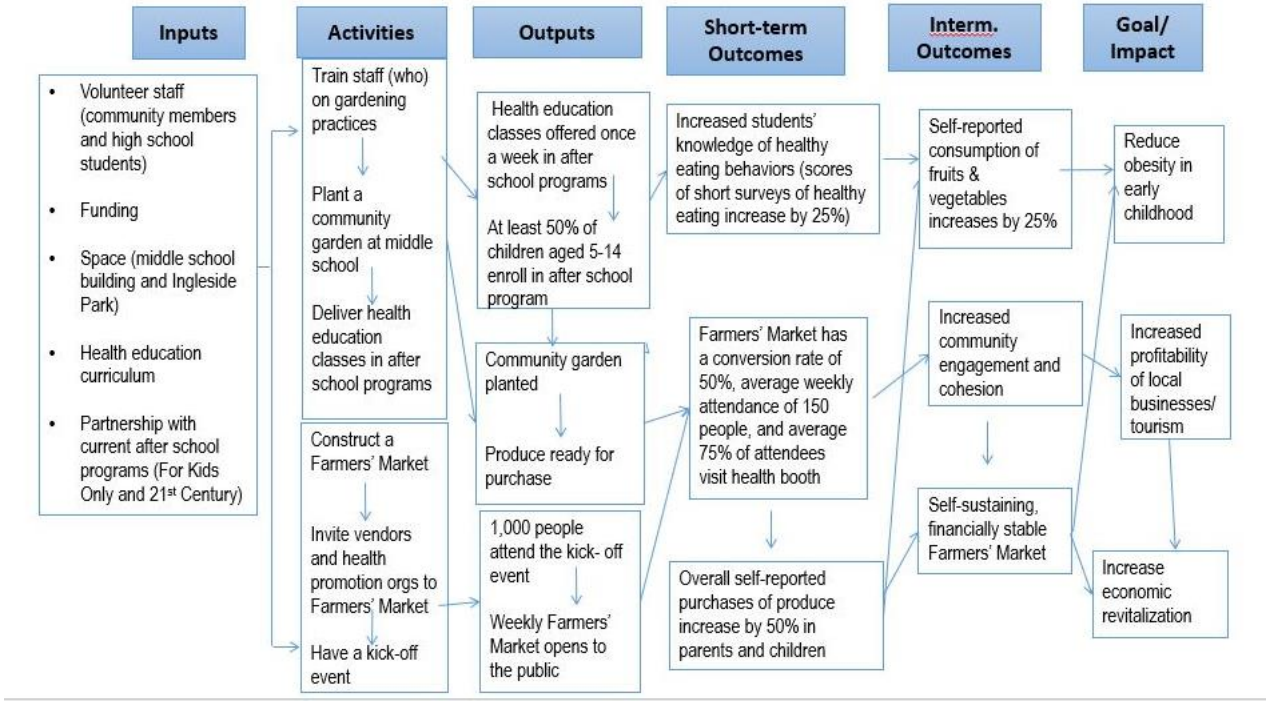
Potential barriers faced may include pushback from the community and unwillingness to introduce change. The overall goal of this intervention is to address the social determinants that may be contributing to increased levels of obesity in the Town of Winthrop among children and adolescents. We hope that because the focus of the intervention is on improving the health of children that it will be accepted among both children and the community. Another barrier may be fear of costs. However, if the after-school nutritional education program and associated community garden are successful, the farmers market has potential to greatly increase access to healthful foods for the community and lower obesity rates.

Next Steps

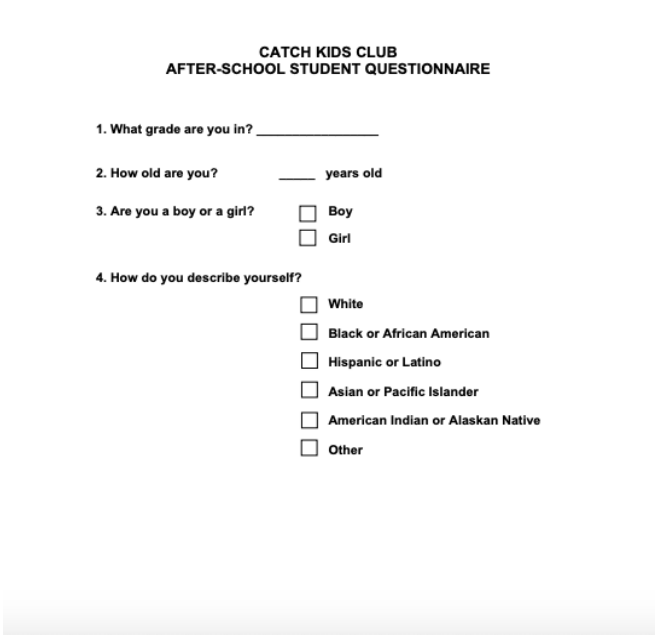
Moving forward, the after-school nutrition education program and community garden need to be established with leadership, student participants, volunteers and funding. Initial evaluations listed above need to be conducted. After six months, the community garden should be able to start selling produce and the introduction of the farmers market with the 2-day event needs to be implemented. The first round of evaluations for students should also be done during this time. After one year, the farmers market will need to be reassessed for future evaluation and feasibility considerations in anticipation of its growth. Students will also be reassessed at the end of the year and the results of the program should be made available to the community. The results will be used to further the growth and expansion of the farmers market and advocate the growth of the after-school program to include more children in the Town of Winthrop.

Appendix

Part A. Logic Model



Part B. CATCH Questionnaire Survey



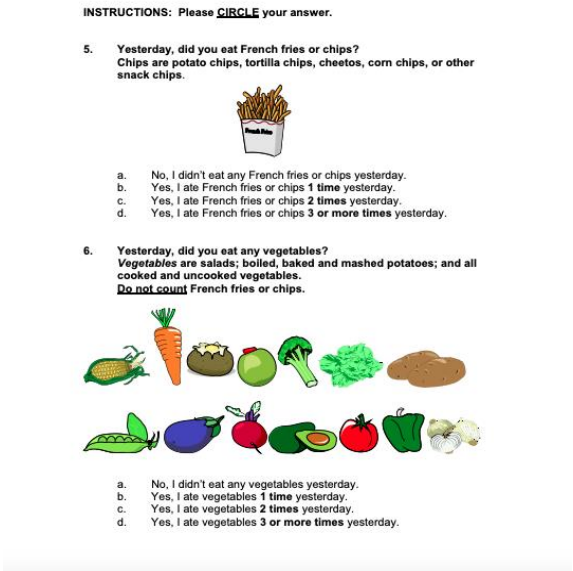
CATCH KIDS CLUB
AFTER-SCHOOL STUDENT QUESTIONNAIRE

1. What grade are you in? _____

2. How old are you? _____ **years old**

3. Are you a boy or a girl?
- ☐ **Boy**
- ☐ **Girl**

4. How do you describe yourself?
- ☐ **White**
- ☐ **Black or African American**
- ☐ **Hispanic or Latino**
- ☐ **Asian or Pacific Islander**
- ☐ **American Indian or Alaskan Native**
- ☐ **Other**



INSTRUCTIONS: Please CIRCLE your answer.

5. Yesterday, did you eat French fries or chips?
Chips are potato chips, tortilla chips, cheetos, corn chips, or other snack chips.

a. No, I didn't eat any French fries or chips yesterday.
b. Yes, I ate French fries or chips **1 time** yesterday.
c. Yes, I ate French fries or chips **2 times** yesterday.
d. Yes, I ate French fries or chips **3 or more times** yesterday.

6. Yesterday, did you eat any vegetables?
***Vegetables* are salads; boiled, baked and mashed potatoes; and all cooked and uncooked vegetables.**
Do not count French fries or chips.

a. No, I didn't eat any vegetables yesterday.
b. Yes, I ate vegetables **1 time** yesterday.
c. Yes, I ate vegetables **2 times** yesterday.
d. Yes, I ate vegetables **3 or more times** yesterday.

7. **Yesterday, did you eat beans such as pinto beans, baked beans, kidney beans, refried beans, or pork and beans?**
Do not count green beans.

a. No, I didn't eat any beans yesterday.
b. Yes, I ate beans **1 time** yesterday.
c. Yes, I ate beans **2 times** yesterday.
d. Yes, I ate beans **3 or more times** yesterday.

8. **Yesterday, did you eat fruit?**
Do not count fruit juice.

a. No, I didn't eat any fruit yesterday.
b. Yes, I ate fruit **1 time** yesterday.
c. Yes, I ate fruit **2 times** yesterday.
d. Yes, I ate fruit **3 or more times** yesterday.

9. **Yesterday, did you drink fruit juice?**
Fruit juice is a drink, which is 100% juice, like orange juice, apple juice, or grape juice.
Do not count punch, kool-aid, sports drinks, and other fruit-flavored drinks.

a. No, I didn't drink any fruit juice yesterday.
b. Yes, I drank fruit juice **1 time** yesterday.
c. Yes, I drank fruit juice **2 times** yesterday.
d. Yes, I drank fruit juice **3 or more times** yesterday.

10. **Yesterday, did you eat sweet rolls, doughnuts, cookies, brownies, pies, or cake?**

a. No, I didn't eat any of the foods listed above yesterday.
b. Yes, I ate one of these foods **1 time** yesterday.
c. Yes, I ate one of these foods **2 times** yesterday.
d. Yes, I ate one of these foods **3 or more times** yesterday.

18. **Do you ever read the nutrition labels on food packages?**

a. Almost always or always
b. Sometimes
c. Almost never or never

19. **How many total servings of fruits and vegetables should you eat each day.**

a. At least 2
b. At least 5
c. At least 9
d. At least 10
e. I don't know

20. **The foods that I eat and drink now are healthy.**

a. Yes, all of the time
b. Yes, sometimes
c. No

21. **Do you ever eat high fiber cereal?**

a. Almost always or always
b. Sometimes
c. Almost never or never

22. **Do you ever eat whole wheat bread?**

a. Almost always or always
b. Sometimes
c. Almost never or never

23. **Do you ever drink 100% fruit juice?**

a. Almost always or always
b. Sometimes
c. Almost never or never

24. **Do you ever eat fruit for lunch?**

a. Almost always or always
b. Sometimes
c. Almost never or never

25. **Do you ever eat vegetables for dinner?**

a. Almost always or always
b. Sometimes
c. Almost never or never

INSTRUCTIONS: Please CIRCLE one of the two foods that you would pick if you had to choose just one.

26. If you were at the movies, which one would you pick as a snack?

a. popcorn with butter

b. popcorn without butter

27. Which would you pick to drink?

a. regular milk

b. low fat or skim milk

28. Which food would you eat for a snack?

a. candy bar

b. fresh fruit

29. Which would you do if you were going to eat a piece of chicken?

a. leave on the skin

b. take off the skin and not eat the skin

30. Which food would you ask for?

a. frozen yogurt

b. ice cream

31. Which would you choose to cook if you were going to help make dinner at home?

a. French fries

b. baked potato

32. Which would you do if you were going to eat cooked vegetables?

a. eat without butter

b. add butter

33. Which would you order if you were going to eat at a fast food restaurant?

a. a regular hamburger

b. a grilled chicken sandwich

INSTRUCTIONS: The questions in this section ask how likely you are to eat some of the foods below. Please answer by circling either NOT LIKELY, LIKELY or VERY LIKELY for each question.

34. How likely are you to drink low fat or skim milk instead of regular white milk?

a. Not likely
b. Likely
c. Very likely

35. How likely are you to eat high fiber cereal instead of a donut?

a. Not likely
b. Likely
c. Very likely

36. How likely are you to eat fresh fruit instead of a candy bar?

a. Not likely
b. Likely
c. Very likely

37. How likely are you to take the skin off of chicken (and not eat the skin)?

a. Not likely
b. Likely
c. Very likely

38. **How likely are you to ask for frozen yogurt instead of ice cream?**

a. Not likely
b. Likely
c. Very likely

39. **How likely are you to eat a baked potato instead of French fries?**

a. Not likely
b. Likely
c. Very likely

40. **How likely are you to drink fruit juice instead of a soft drink (a soda pop)?**

a. Not likely
b. Likely
c. Very likely

41. **How likely are you to order a grilled chicken sandwich at a fast food restaurant instead of ordering a hamburger?**

a. Not likely
b. Likely
c. Very likely

INSTRUCTIONS: Please CIRCLE ONE of the two foods that you think is better for your health.

42.

a. whole wheat bread

b. white bread

43.

a. broiled beef

b. broiled fish

44.

a. cereal

b. eggs and bacon

45.

a. beef

b. beans

46.

a. chicken

b. regular hamburger

47.

a. regular milk

b. low fat or skim milk

48.

a. frozen yogurt

b. ice cream

49.

a. green salad

b. French fries

50.

a. French fries

b. baked potato

51.

a. 100% fruit juice

b. fruit punch

Paper Two: Winthrop Intervention Proposal

Elana Horwitz, Jessica Keller, and Katharine Perry

Introduction

Primary Determinants of Healthy Eating

The issues that Winthrop is currently facing are high rates of obesity and lack of town revenue. Our discussion with Meredith Hurley, who works for the Winthrop Public Health Department, provided insight into the behaviors of community residents that she believes are linked to their obesity rates and low town revenue. With this information, it was discerned that the three primary determinants affecting healthy eating in Winthrop are availability, accessibility, and affordability to healthy foods. Lack of availability of healthy foods can be defined as an area or community that has very limited options of healthy food provided. Affordability can be defined as the prices at which healthy foods are sold, in comparison to the prices of other unhealthy foods. Accessibility can be defined as having healthy food stores close to home. These determinants fall at the community level of the social ecological model and relate to each other while affecting Winthrop residents.

Winthrop currently has one local grocery store, and no supermarket stores. The produce prices at the local store tend to be higher because of limited inventory. This local store also does not accept SNAP benefits. Meredith explained that the owner would like to expand to be able to offer healthier selections but does not have the space at his current location. She also noted that there are a large number of convenience stores in Winthrop. One study found that "neighborhood residents who have better access to supermarkets and limited access to convenience stores tend to have healthier diets and lower levels of obesity." (Larson, 2008). In addition, only having one local grocery store limits access to healthy food options depending on proximity to said store. Another problem caused by the limited grocery selections was noted in the UMass Collins Center's 2014 Economic Trends Report, as it found that 68% of Winthrop retail spending is completed outside of town, contributing to the town's lack of revenue (Edward J. Collins, Jr. Center for Public Management, 2014). Due to the one local grocery store selling healthy food for high prices, and several convenience stores with limited, if any, healthy food options, we can conclude that availability, accessibility, and affordability are the three main determinants impacting healthy eating in Winthrop.

Health Objectives

Our health objectives, while focused on healthy eating, take into account that Winthrop has other challenges that require immediate attention. The lack of revenue for Winthrop will have catastrophic ramifications if not addressed. The first health objective is the target population will increase purchasing of healthy foods, namely fruits and vegetables, by at least 10% over the course of one year. As previously mentioned, opportunities for this community are quite limited, which is why we have chosen this objective as one focus. Our second health objective is that the target population will increase consumption of the purchased fruits and vegetables by at least 10% over one year. Purchasing healthy foods does not always equate to consuming healthy foods, so we want to focus on both of these predictors of healthy eating. Our last health objective is to reduce overall obesity rates in Winthrop by at least 5% over a five-year period. This final objective is directly affected by the first two objectives, while all three influence physical activity, community cohesion, and town revenue for longer term goals through our proposed intervention. Using these objectives and knowledge about Winthrop, we designed an intervention targeting healthy eating that aligns with the target populations' values and needs.

Intervention

Evidence

In food deserts such as Winthrop, the implementation of farmers' markets is used to alleviate some of the health concerns linked to the lack of resources. In areas with low access to supermarkets, residents tend to pay more for grocery items (Larsen & Gilliland, 2009). In these areas fruits and vegetables not only cost more but are significantly less readily available at smaller retail shops (Larsen & Gilliland, 2009). By introducing a farmers' market into a food desert neighborhood, research has found that fresh produce availability increases and household spending on food decreases (Larsen & Gilliland, 2009). Additional benefits of farmers' market implementation include a greater variety of fruits and vegetables (Larsen & Gilliland, 2009). Farmers' markets have been found to promote healthy eating overall when embedded in food deserts as one study found that residents who shopped at mobile markets consumed significantly higher quantities of fruits and vegetables than those who did not shop at these markets (Zepeda, Reznickova, & Lohr, 2014). Especially when combined with additional health promotion efforts and strategies, farmers' markets provide opportunities for dietary change (Evans et al., 2012).

Sporting events not only promote increased physical activity in those participating in the sport, but also may serve to motivate spectators to increase their own physical activity. Literature demonstrates that sporting event spectators are inspired to be physically active after watching, however, the strength of inspiration may be impacted by certain characteristics including age (Ramchandani, Kokolakakis, & Coleman, 2014). The most significant influences stemmed from observing team sports at events for all ages (Ramchandani, Kokolakakis, & Coleman, 2014). Ramchandani, Kokolakakis, and Coleman (2014) found that nearly two thirds of spectators at hockey events felt inspired to partake in sports and general physical activity. Additional evidence for success of increasing physical activity of residents of Winthrop is their self-identified sports-driven identity and their passion for hockey. The athletic condition of Winthrop primes the community for engagement and attendance at hockey events.

Intervention Overview

The proposed intervention is a two-pronged program utilizing the abandoned middle school building in a prime location in Winthrop. We propose implementing a year-round farmers' market on the second floor of the building, engaging local farms as well as artists and musicians. The second part of the proposed intervention is to renovate the locker rooms and bathrooms of the middle school building to be used for hockey and ice rink events. This will provide additional space and better facilities, so that the town can host an annual state-wide hockey tournament, as well as increase their offerings of town-centered events at the rink. These events will coordinate with the farmers' market with the intent of attracting a wider range of residents to participate in the various activities.

Demand: Community Engagement

This intervention aims to engage community members and key stakeholders to encourage healthy behaviors and cohesion of Winthrop residents. By aligning the goals of the intervention with town priorities, including financial concerns, we will garner the support from Winthrop leadership. Town leadership support is significant in achieving this intervention as the renovations will cost the town money in the short-term. We must sufficiently present the long-term financial benefits of the intervention in order to gain approval and move forward. In order to implement this program, other key stakeholders include local farms, musicians, and artists. Additionally, high school students,

school faculty, and local hockey league coaches and members must be engaged for this intervention to succeed.

Once the intervention is implemented, community members will be engaged and increase their community connectedness. The farmers' market will bring community members together to increase a sense of community cohesion as well as contribute to the economic growth of the town. Similarly, the proposed hockey events will serve to not only increase the physical activity of Winthrop residents and offer opportunities for revenue growth from outside sources but increase community cohesion as well. The nature of programming through both parts of the intervention leads to positive community engagement and events promoting unity and cohesion.

Feasibility

The feasibility of this intervention is largely based on the knowledge that Winthrop had a farmers' market up until this past year, the hockey rink is a source of revenue for the town, and the middle school is currently abandoned but money is being spent to maintain the property. These points lead us to believe that this intervention will not only be beneficial to the Town of Winthrop in terms of health and economic outcomes but will also be manageable for the town and supported by residents.

To implement the farmers' market portion of the intervention resources needed include both human and physical resources. As for human resources, engagement of community members, school faculty, high school student participation, and community partners such as local farms, artists, and musicians are necessary. Community member buy-in is essential as the farmers' market will have no effect on the town if townspeople do not participate. This is not anticipated to be a barrier as when farmers' markets were previously held in Winthrop there was high community participation, and some residents have reported missing the farmers' market. Participation of school faculty and volunteer high school students is necessary to help run the farmers' market at low cost. Because high school students are required to accumulate volunteer hours, the farmers' market provides a way to achieve those hours. It would be ideal to have the faculty member that is in charge of student volunteer hours involved as a means to increase accountability of the high school students. Finally, community partners such as local farmers, artists, and musicians are necessary to ensure there will be fresh produce to buy at the farmers' market but also crafts and local art.

Physical resources include tables and the middle school location. The middle school is currently being maintained; therefore, no extra money would have to be allocated toward the use of the location. The indoor location allows for the farmers' market to be held year-round. Tables will be necessary to have the stands at the farmers' market.

For the hockey rink portion of the intervention, the support and dedication of the management team will be a key part of coordinating the construction and ensuring that there is greater utilization of the rink; this would include scheduling tournaments and contacting outside sources (e.g. teams) that may want to use the rink. A construction company will also be necessary as a major reason why larger tournaments are currently difficult to host is the limited locker room space and a lack of sufficient bathrooms. Because the hockey rink is connected to the middle school a lower cost solution is utilizing a portion of the middle school as locker rooms. To make this happen there will have to be greater allocation of funds to the ice rink to pay for construction.

After the initial inputs to restart the farmers' market and to add viable locker space room for the ice rink, there is relatively little needed to sustain these changes. Major influences for sustainability will be the group that is formed to organize the farmers' market, and the management team at the

hockey rink. The farmers' market organizers are key because the past farmers' market ended because they felt burnt out. This is not an anticipated problem with this intervention because there will be increased support from the high school students and faculty leader built into the original plans of the farmers' market. The management team at the hockey rink will be essential for sustainability to ensure scheduling of more tournaments to increase profits.

Demand: Non-Health Priority

This intervention was created to achieve the health benefits of decreased obesity rates through greater availability of healthy food options, increased physical activity, but also to increase community capacity and to increase town profits made by the ice rink. The key non-health related outcome is the increase in profits. This is essential because of the predicted debt that Winthrop will face in the next fiscal year if nothing changes. If the intervention is carried out successfully it is predicted that ice rink profits will increase because there will be greater utilization of the rink through an increase in the number of tournaments and other hockey events.

Logic Model

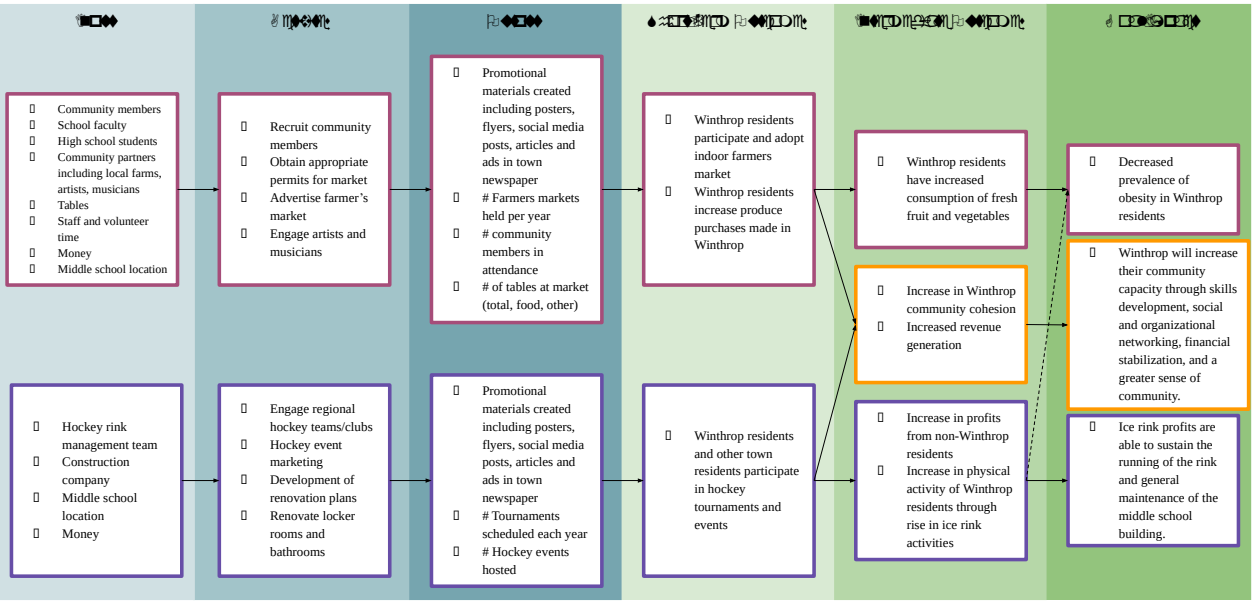
Description

There are two prongs to this intervention which will solicit individual short-term goals and will interact to solicit intermediate and long-term goals. It is expected that engagement in the suggested activities outlined in the logic model will produce the short-term goals of Winthrop residents participating in the indoor farmers' market, and increasing produce purchased in Winthrop. On the hockey side of the intervention it is expected that Winthrop residents will participate in an increased number of hockey tournaments and ice rink events.

If short-term outcomes are reached than it is reasonable to expect that they will lead to the intermediate outcomes. In regard to the resident participation in the farmers' market and increased quantity of produce purchased within Winthrop, it is reasonable to assert that increased quantity of produce purchased will translate to increases in produce consumed. Increased participation by residents in hockey events should lead to increased town revenue through more hours of ice time being purchased and increased physical activity for residents. Physical activity is expected to increase because there will be an increased number of opportunities to be physically active at the ice rink and for spectators to feel inspired. Both prongs of the intervention combine to lead to the intermediate outcome of increasing community cohesion and increasing town revenue. Community cohesion will be increased because both the farmers' market and changes to the ice rink will increase the time the community is brought together. Both will also increase revenue because they will increase spending within the town.

Finally, these intermediate outcomes will lead to the long-term outcomes of decreased prevalence of obesity, increased community capacity, and increased town revenue to offset costs of maintaining the middle school.

Logic Model



Evaluation

Evaluation Team

To start our evaluation process for our proposed intervention, we need someone to lead the effort. For this position, Meredith is perfectly positioned to oversee the evaluation efforts. For conducting said evaluation, Boston University practicum students could continue partnering with the Winthrop Public Health Department, under Meredith's guidance. This evaluation team would be mutually beneficial, as the students would gain a plethora of real world experience, and the intervention would benefit from being evaluated by persons with public health background.

Components

To accurately assess the process and impact of this intervention, we recommend implementing an evaluation employing a feasible yet effective design for Winthrop. We do not plan to use a comparison group due to the unique nature of Winthrop. Winthrop has baseline features that would be difficult to match including its geographic characteristics, such as having only two pathways in and out of town. We acknowledge that it weakens the evaluation to not have a comparison group, however, the lack of feasibility in having a sufficiently comparable town led to this decision. In order to strengthen the evaluation, we plan to gather data from both pre and post-intervention.

Sample. Since this intervention is targeting all Winthrop residents, we plan to collect data from a representative sample of residents. This sample will be determined through a random selection of households. 30% of all households in Winthrop will be chosen at random using publicly available phone and address information. Using a sample of all households allows for more rigorous follow-up procedures and is more feasible for the evaluation team. One adult per household will be expected to complete surveys including information and responses relevant to the entire household. We

expect that households will range in number of people and demographic characteristics but will be representative of the makeup of all households in Winthrop.

Measurement Time Points. In order to evaluate all components of the intervention and compare data to baseline measurements, we recommend executing the survey at three time points; once will take place pre-intervention, once at three months, and once at 12 months. Additionally, in order to evaluate the long-term impact on health, we suggest implementing a measure to evaluate outcomes at five years. In order to better understand the challenges and successes of the implementation process, we recommend collecting qualitative feedback from key stakeholders at 12 months.

Measures

Indicators. Knowledge, purchasing behaviors, consumption behaviors, physical activity levels, obesity and community capacity are all indicators that will be important to collect to measure outcomes. To best assess the intervention's effect on these indicators, baseline data will also be collected in these areas. It will also be essential to collect data regarding household demographics as they may be important moderator to consider when analyzing the data.

Type of Data. Both quantitative and qualitative data will be collected. While most validated questionnaires use quantitative data, qualitative questions will be included to gain a greater scope of information from the community.

Measurement instruments. Though there are a variety of measurement tools designed to assess knowledge, because in this case knowledge refers to the knowledge of the farmers' market and ice rink events, qualitative and quantitative questions will be created to assess a household's knowledge of these events. An example of a questions related to knowledge might be "have you heard about the local farmers' market?", "when was the last time you heard about the farmers' market?", "when was the last time you heard about a local ice rink event?".

Purchasing behavior will be assessed by qualitative questioning. A verified method will not be used because of the nuanced purchasing we are concerned with. The questionnaire will ask about the quantity of fruits and vegetables that the household purchases on a weekly basis, if the produce is fresh, canned, frozen, or dried, and where these items are primarily purchased.

Food consumption behaviors will be collected with a 24-hour recall method. Specifically, the ASA24 can be used. This is an online automated and self-administered 24-hour dietary assessment tool. This tool is particularly well suited to measure change in serving sizes consumed because when users input quantities consumed an example plate is shown with that quantity of food. An example of this questionnaire can be found in Appendix A ("Welcome to the ASA24 Researcher Site," n.d.)

Physical activity levels and will be measured by the IPAQ short version. This tool is located in appendix B ("International Physical Activity Questionnaire ("IPAQ," 2002.).

Obesity levels will be measured by report of height and weight for all individuals. From these reports BMI will be calculated during the analysis process.

Due to there being no current validated questionnaire measuring community capacity it is suggested that a student intern brought on should design a questionnaire to rate community cohesion using the principles that community capacity is composed of the following components: skills development, social and organizational networking, financial stabilization, and a greater sense of community.

Data Sources. Households will be sent the data collection materials and an adult in the household will be responsible for filling the materials out for all individuals in the household. This allows data to be collected on both children and adults.

Data Collection Methods. Once the participating households are selected, the evaluation team will utilize both mail and digital surveys to conduct a pre-intervention survey and post-intervention surveys. Mailed surveys will include a pre-stamped and labeled envelope in order to encourage completion of the survey. Additionally, these surveys will include incentives dependent on the evaluation budget; suggestions include return address stickers, raffle entrance tickets, or reusable tote bags. Once surveys have been distributed through the mail and electronically, the evaluation team will implement follow-up procedures including mailed reminder cards and phone calls to check on survey completion. Data collection for the long-term outcomes at five years will be conducted through quantitative data collection through town records in addition to surveys. This type of data collection will also be used to determine pre-intervention health data of the town as a whole. Alternative methods will be used in order to gain additional feedback data from key stakeholders in this intervention. The evaluation team will reach out to stakeholders and conduct in-person interviews to determine strengths and challenges of the intervention implementation process.

Implications

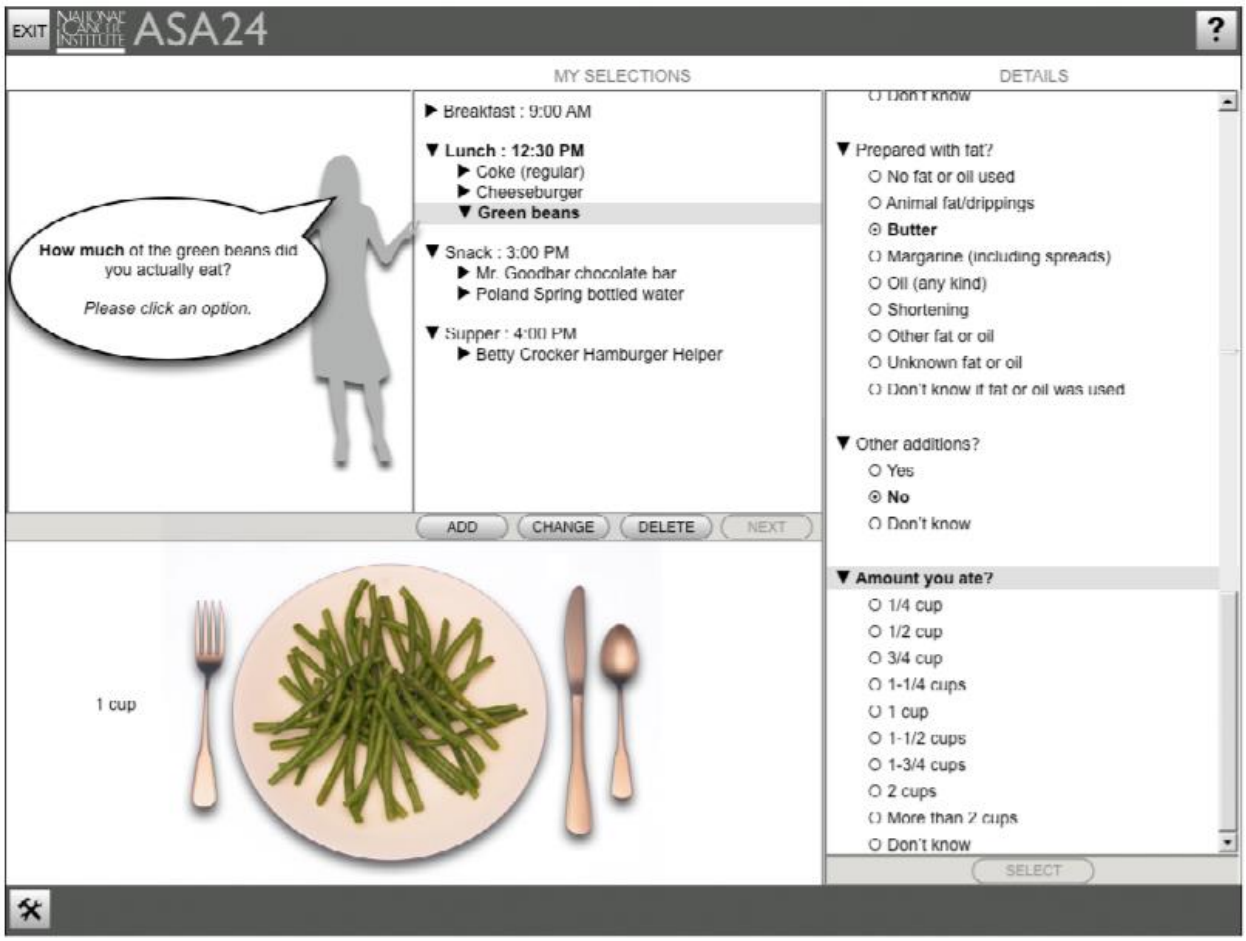
Intervention success will be looked at in a multi-pronged approach. The success of the farmers' market will be defined, as will the success of the middle school remodel/hockey tournaments, and success will also be looked at holistically. We will define success of our farmers' market by residential use of our indoor farmers' market, as well as attendance and enjoyment. Increased purchasing of healthy foods at the farmers' market will expose success. Attendance at hockey tournaments, as well as other town involvement will indicate success of the middle school remodel and hockey events. Levels of enjoyment at these events will also indicate success. Other measures that can be used to determine the success of the intervention would be increased retail spending within Winthrop, and in turn increase town revenue, as well as improved community cohesion based off of self-report data. Increased intent to be physically active, and increased levels of physical activity because of hockey tournament influences would also be indicators of success. Lastly, we will look at our objectives to measure the intervention's success. Our health objectives clearly lay out expectations of the intervention, and success can be measured by attainment of those goals. However, because these objectives are time sensitive, the previously mentioned measures of success must be considered and included in our final conclusions.

Contributions

Each team member contributed equally to the development of the intervention and written report. The team determined responses to each question collaboratively and divided the writing between members. Each member participated in the presentation development and reviewed the final products.

Appendices

Appendix A



INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

1. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

   _____ **days per week**

   ☐ No vigorous physical activities → ***Skip to question 3***

2. How much time did you usually spend doing **vigorous** physical activities on one of those days?

   _____ **hours per day**

   _____ **minutes per day**

   ☐ Don't know/Not sure

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

   _____ **days per week**

   ☐ No moderate physical activities → ***Skip to question 5***

SHORT LAST 7 DAYS SELF-ADMINISTERED version of the IPAQ. Revised August 2002.

4. How much time did you usually spend doing **moderate** physical activities on one of those days?

_____ **hours per day**

_____ **minutes per day**

☐ Don't know/Not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

5. During the **last 7 days,** on how many days did you **walk** for at least 10 minutes at a time?

_____ **days per week**

☐ No walking → ***Skip to question 7***

6. How much time did you usually spend **walking** on one of those days?

_____ **hours per day**

_____ **minutes per day**

☐ Don't know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the **last 7 days,** how much time did you spend **sitting** on a **week day**?

_____ **hours per day**

_____ **minutes per day**

☐ Don't know/Not sure

This is the end of the questionnaire, thank you for participating.

SHORT LAST 7 DAYS SELF-ADMINISTERED version of the IPAQ. Revised August 2002.

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