

Article

Jump2Health Website™ for Head Start parents to promote a healthy home environment: Results from formative research

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Significance for public health

Overweight and obesity in preschool children are at undesirable levels, reflecting a need for parent education programs that address a comprehensive set of obesigenic behaviors (diet, family meals, physical activity, sleep, and screen time) and meet parental needs in terms of accessibility and appeal. Formative evaluation with stakeholders (parents, teachers, and nutrition experts) was useful in shaping the development of the Jump2Health Website™. Websites may be able to overcome some of the challenges of traditional in-person education programs as parents can learn at their own pace and schedule. Parents may be able to obtain information from a website that they would have not felt comfortable asking their paediatrician. Stakeholders suggested that shorter text passages and additional topics on weight control and bullying be included. To provide more access and appeal, a mobile website for smartphones and other supportive materials (newsletters, text messages, and an interactive discussion blog) may be needed.

Abstract

Background: In US, approximately 23% of children between the ages of 2-5 years are overweight or obese. Parents need access to information to create healthy home environments for obesity prevention, yet participation for in-person education programs is challenging. Web-based interventions are promising educational tools due to 24/7 availability. However, information is limited on their development and evaluation.

Design and Methods: This study reports on a rigorous development process that included six focus group discussions (FGD) with stakeholders (three FGD each with parents and teachers) to assess education needs and inform the development of the Jump2Health Website™ by a multidisciplinary team. After development, the Website was evaluated by telephone interviews with stakeholders (five parents and six teachers) and reviewed by an expert panel of five Registered Dietitians.

Results: Twenty Head Start parents and 22 Head Start teachers participated in the FGD. To address the needs identified by these stakeholders, the Website was designed to include components that were enabling and motivating, such as descriptions of health benefits by achieving the desired behaviours, short videos on easy meal preparation, and tip sheets on how to achieve healthy behaviours in easy, economical ways. Stakeholder evaluation of the Website indicated that the information was helpful, easy to use, and would be beneficial for parents.

Conclusions: The development of Jump2Health Website™ was strengthened by FGD with stakeholders that assessed educational needs. Interviews with stakeholders and an expert panel review showed that the Website may be an effective educational method to teach parents about healthy behaviours related to obesity prevention.

Introduction

Approximately 23% of children between the ages of two to five in the United States are classified as overweight or obese, and almost 9% are obese.¹ Even though a recent report suggests that the prevalence in obesity in preschool children has been reduced in 19 states,² levels are still undesirably high and almost double the levels of 5% in the 1970's.³ Overweight or obese pre-schoolers are five times as likely to become overweight or obese adults, compared with their normal weight peers.² In older children and adolescents, obesity is associated with high cholesterol, high blood sugar, asthma, and mental health problems. Studies suggest that the prevention of childhood obesity is related to multiple behaviours including: consuming more whole grain foods, consuming more fruits and vegetables, consuming less sweet drinks, and having more family meals, engaging in more physical activity, getting adequate amounts of sleep, and engaging in less screen time.⁴⁻¹¹ These seven behaviours will be referred to as *7 Healthy Habits* for this study.

To help parents develop a healthy home environment that will protect against child obesity, nutrition and health professionals need to provide parents with appropriate resources.¹² However, traditional in-person educational interventions with families are difficult due to work schedules, lack of time, and child care issues.^{13,14} These and other challenges may be especially prominent in parents with low-income^{15,16} and may contribute to the finding that only 39% of low income parents responded that they were likely to sign up for a parenting program.¹⁵ Through electronic health (e-Health) programs such as websites, parents could engage in online education programs from home while caring for children. Thus, in light of challenges related to traditional in-person education methods, web-based education is promising due to its 24/7 availability and its growth in accessibility. Americans' Internet access has increased from 52% in 2000 to 84% in 2015; access by households with an annual income under \$30,000 a year is 74%.¹⁷

Also, web-based education or e-Health may be as effective as traditional in-person education methods; however, this may depend on the behaviour (physical activity, dietary) and whether these behaviours are studied separately or together.¹⁸ In a comparison of a web-based versus in-person nutrition education program for low-income adults, web-based participants made significant improvements ($P < 0.05$) from pre to post in 15 of the 16 health-related behaviour outcomes (fruit and vegetable intake, breakfast eating, meal-planning frequency, physical activity, etc.).¹⁹ The participants in the in-person education group improved significantly ($P < 0.05$) from pre to post in 13 of the 16 health-related behaviour outcomes. These results showed that web-based education was similar in effectiveness to in-person education for dietary and physical activity outcomes. In addition to being accessible and

effective, web-based programs may be less expensive and more environmental friendly than in-person education programs.²⁰ Even though there is great potential for e-Health to reach large groups of people, more research is needed on acceptability, accessibility, and effectiveness of web-based and other e-Health programs, especially in underserved populations.¹⁸ Further, while there are studies on obesity prevention in preschool children that include one or more desirable features (theory-based, stakeholder driven, and inclusion of multiple behaviours that are related to the health outcome),²¹⁻²³ only one study that includes all of these using e-Health has been reported, and it is in progress.²⁴

Given the need for innovative and accessible education programs to create healthier home environments for children in low-income families, the goal of this research was to use stakeholder and expert input to develop and evaluate a theory-based educational website focused on 7 Healthy Habits for child obesity prevention. To achieve this goal, the PRECEDE-PROCEED planning model (PPM) was used to guide the engagement with the target community to determine education needs.²⁵ PPM has been used effectively to design interventions for a variety of populations and health issues for the past 30 years, with over 1000 publications reporting its use.²⁶ Specifically, PPM has been used to guide the qualitative assessment and development of healthy eating and childhood obesity prevention interventions in the CHANGE! Program²⁷ and the ToyBox-study.²¹ PPM can be thought of as a road map and behaviour change theories as the specific directions to a destination.²⁸

Materials and Methods

This study included two Phases conducted in 2012-2013. Phase I included a needs assessment and the development of the *Jump2Health Website*[™]. The needs assessment informed a multi-disciplinary team of faculty and graduate students in the fields of nutrition, child development, computer science, and marketing in the initial prototype development of the *Jump2Health Website*[™]. Phase II evaluated the acceptability and feasibility of the *Website*. Both Phases I and II were approved by the Human Research Protection Program at Texas Tech University.

Phase I: The Phase I Focus Group Discussions (FGD) were conducted with a self-selected sample of Head Start parents and teachers to identify low-income parents' needs related to promoting a healthy (non-obesogenic) home environment using the 7 Healthy Habits. All preschool teachers and parents who had children at 10 Head Start sites (29 teachers and 900 parents) in a local school district were invited to participate. Teachers were notified

via email about the study from the Head Start Coordinator for the school district. Teachers then distributed recruitment fliers provided by the researchers to parents in their classrooms via their child's school folder that was routinely used for communication purposes between schools and parents. Parents and teachers then emailed the first author with their preferred date to attend one of the FGD. Three FGD were conducted with parents, and three FGD were conducted with teachers. The three FGD for parents had 5, 6, and 9 participants, respectively, for a total of 20 participants. The three FGD for teachers had 8, 5, and 9 participants, respectively, for a total of 22 participants. All FGD were held immediately at the end of the school day (teachers) or early evening (parents) at one of three elementary schools with a Head Start component. Child care was provided.

The content of the FGD questions (Table 1) included the 7 Healthy Habits and reflected the constructs of the PRECEDE component of the PRECEDE-PROCEED model (PPM).²⁵ Constructs and their definitions include: i) Predisposing (knowledge and attitudes that need to be in place for the desired behaviours to occur; ii) Enabling (resources and skills that need to be available to help facilitate the desired behaviours; and ii) Reinforcing (praise and encouragement from others and perceived benefits from performing the behaviour). Thus, an application of the PPM's *predisposing* and *enabling* constructs is shown in this study by *Question 4: What information or resources would help you as a parent to help prevent or reduce these problems?* To the extent that health education programs address a priority population's predisposing, enabling, and reinforcing needs, it can promote positive behaviour change.

All the responses were audio taped and transcribed after each FGD. NVivo qualitative analysis software (version 10.0, QSR International, qsrinternational.com) was used to analyse and code the responses from the FGD. Prior to coding, a preliminary codebook was developed related to the predisposing, enabling, and reinforcing constructs of the PPM. This allowed a deductive approach to guide initial coding similar to that employed by other researchers using qualitative research and the PPM to inform the development of health interventions.^{27,29} There were two coders, the first author and another doctoral student in nutritional sciences who was not affiliated with the research, but who had previously coded transcripts for other nutrition studies. They reviewed and coded the transcripts line by line in open coding that was modified by using the PPM constructs and the codebook as a general guide. Additional codes were added as part of the modified open coding process, if the content involved multiple constructs or did not fit within the three PPM constructs. All disagreements in coding were resolved through discussions with the two coders and the second author until consensus was reached. Emergent themes across FGD

Table 1. Questions for focus group discussions with Head Start parents and teachers.

Questions
1. Which of these are problems for preschool children? (not eating enough fruits and vegetables, not eating enough whole grains foods, not getting enough physical activity, are watching too much television, drinking too many sweetened beverages, and not getting enough sleep)
2. What do you think contributes to (causes) these problems in preschool children?
3. How do parents play a role in helping to prevent or reduce these problems?
4. What information or resources would help you as a parent to help prevent or reduce these problems?
5. What are the challenges for you as a parent to prevent or reduce these problems with your child?
6. We plan to develop a website that will have information and resources to help parents help their children have healthier habits (more fruits and vegetables, more whole grains, more physical activity, less television). What would be the advantages and disadvantages of having a website like this? Would you use it? How could we encourage parents to use the website?

In Focus Group Discussions with Teachers, Questions 4, 5, and 6 were worded to reflect their perceptions about parents' needs.

were explored by the first and second authors using an inductive process.

Phase II: To obtain feedback on the *Website* after development (Phase II beta-testing), telephone interviews were conducted with a self-selected subsample of the parents and teachers who participated in the Phase I FGD and who indicated at that time that they would be interested in providing feedback about the *Website*, once it was developed. The five parents and six teachers who consented to participate were given a link to the *Jump2Health Website™* and asked to look at the 7 Healthy Habits sections for at least 20 minutes prior to participating in an individual interview set at their preferred day and time. Table 2 presents the questions asked to parents in Phase II; teachers were asked similar questions that were phrased to capture their views about the *Website* related to parents' needs and perspectives. Participants were emailed a copy of the questions in advance of the interviews to save time during the interview. Individual telephone interviews were conducted with the parent and teacher participants, using trained interviewers who were not members of the research team. The telephone interviews were audio-recorded and transcribed manually using word processing software.

In addition, feedback about the *Website* was obtained from an expert panel of five Registered Dietitians/Nutritionists (RDNs) recruited from the local Academy of Nutrition and Dietetics list-serv (approximately 35 members). Panel members were not compensated for their participation. Their feedback was obtained by an online survey using Qualtrics (online survey tool for data collection and analysis, version 2013, Qualtrics, LLC, <http://www.qualtrics.com>). The links to the *Website* and to the Qualtrics evaluation survey were emailed to the expert panel. Table 3 shows the questions asked to the panel.

Results

Phase I: A total of 20 Head Start parents (19 females and 1 male) participated in the FGD. Approximately one-half (9) of the parents were 30 years of age or younger; one-half (10) were single; three-fourths (15) had some college or a bachelor's degree, two-thirds (13) were employed, and two-thirds (13) had 1-2 children. A total of 22 teachers (all females) participated in the FGD. Eight of

Table 2. Interview questions for parents and teachers.

1) About how much time have you spent looking at the Website?	a) 1-30 minutes; b) 31-59 minutes; c) 60 minutes or more
2) How did you access this Website?	a) Phone; b) Personal laptop/Computer; c) Public computer such as library; d) Tablets such as Ipad, Touchpad etc (If yes, specify what brand); e) Other means?
3) Where do you usually get your nutrition or health information from?	a) Magazines; b) Internet; c) Books; d) Television/Radio; e) Friends and Family; f) Other
4) How does using this Website compare with learning about nutrition using the sources you have mentioned? (<i>State the exact options here</i>)	a) Very helpful; b) Somewhat helpful; c) Not at all helpful.
5) Compared to other sources of nutrition information, please say a "Yes" or "No" or "Somewhat" for each item	The website was: Well-organized; Reliable, accurate information; Attractive; Easy to use; Easy to read; Accessible; Enjoyable; Provides helpful information
6) What are some of the possible reasons that would discourage you from using the Website? Please say a "Yes" or "No" or "Somewhat" for each item.	Possible reasons: Lack of time; Inability to access Internet; Not interested; Website is not appealing; Any other barriers that I haven't mentioned?
Preferences	
7) Please tell us your reasons for using our Website. (<i>Probe: Do your children have issues with one or more of the 7 Healthy Habits? Do you like to know about nutrition and health related information?</i>)	...
8) On the Website, there are sections for 7 Healthy Habits. Do you have these pulled up on your screen? If not, I can read them to you. Please tell me which of the 7 Healthy Habits sections you have looked at	...
9) Of all the sections you looked at, which sections did you find most helpful? And how was each helpful?	More Whole Grains; More Fruits and Vegetables; Less Sweet Drinks; Less Screen Time; More Physical Activity; More Family Meals; More Sleep
10) Please tell me the parts of the Website that are the least interesting or least helpful to you.	...
11) How do you think this Website can be used as an effective tool for parents to improve their children's choices about eating, physical activity, and other health habits?	...
12) Does this Website provide information related to your concerns about your children's health habits? (If yes, please ask for examples)	...
13) Do you think this Website provides enough information for you to make informed decisions? (If yes, please ask for examples)	...
14) Which of the following statements best describes you in terms of knowledge gained from this Website?	a) I feel more knowledgeable about the 7 Healthy Habits after viewing this Website; b) I feel somewhat more knowledgeable about the 7 Healthy Habits after viewing this Website; c) I know this information already. I want different information

Note: In Interviews with Teachers, Questions 6, 7, 9, 10, 12, and 13 were worded to reflect their perceptions about parents' needs.

the teachers had 5 years or less preschool teaching experience, and 10 had 6-15 years teaching experience.

Themes identified based on PRECEDE-PROCEED planning model constructs

Predisposing: Knowledge and attitudes related to the 7 healthy habits

Overarching theme: Parents in all of the FGD reported that they lack knowledge and strategies related to the 7 Healthy Habits for obesity prevention. They indicated specific circumstances that were particularly challenging: picky eaters and weather issues. Teachers confirmed that parents had numerous gaps in their knowledge, especially related to healthy food choices, food preparation, and sleep guidelines.

Parent responses to questions in the FGD showed a lack of knowledge of the importance of whole grains, fruits and vegetables, physical activity, and family meals and a lack of knowledge of the negative consequences of high intakes of sweet drinks, inadequate sleep, and excessive screen time. In addition, parents lacked strategies for improving these behaviours in their children. These parent quotes reflect these findings:

We do not have a set sleep routine at home. Every day is different for us. Our kids go to bed with us.

My child is horrible; he eats only 6 things, really picky with textures. No meat. No vegetables. Only crackers, cheese, peanut butter and now started peanut butter and jelly. It is challenging, and it's been like that since he was born.

When it is too hot outside, my children are at home most of time. They watch TV. I don't know what else to do.

In addition, parental knowledge gaps related to healthy habits were reported by teachers in the following comments, based on their interactions with parents and students:

We often see ourselves providing suggestions to parents about parenting and nutrition. Parents need to be educated.

Parents pack lunches for their children and often make poor meal choices such as chips and soft drinks.

Parents need cost effective ways to cook. In fact, I think most parents need basic cooking classes.

We see a lot of children sleeping in the classroom, being inactive. It is a constant struggle to deal with children with behavioural issues.

Enabling: Barriers to address and resources and skills needed related to the 7 healthy habits

Overarching theme: The perception that performing healthy habits takes too much money and time was very prevalent across all parent and teacher groups and represents a significant barrier that needs to be addressed. Parents were interested in learning about resources and skills related to healthy habits, especially cooking skills. Ideas for creative physical activity and help with sleep schedules were also mentioned frequently. Comments indicated that some parents already had been trying to make changes or were considering making changes in these behaviours. There was not a consensus on the best method for learning about the 7 Healthy Habits. Some parents and teachers mentioned traditional print materials, like newsletters that could be sent home, but disadvantages to that were identified. Even though some parents mentioned that they were using the Internet to search for information and recipes and most parents said they would be interested in using a website to access health information, a few parents and teachers felt that not all parents would have access.

Barriers. Over half of the preschool parents perceived lack of money and inability to purchase healthy foods as one of the major causes that contribute to poor health habits in preschool children. This is expressed by these parent quotes: *It is really expensive to eat healthy. It is cheaper to get a bag of Fritos or chips than to get apples or peaches and I am constantly trying to find coupons to buy foods for cheaper cost. I really like to buy fresh foods, but we cannot afford them.*

Some parents mentioned barriers to physical activity, such as unsafe neighbourhoods, not having enough money to enrol their kids in extracurricular activities, and lack of time. One of the parents mentioned her awareness that some children are bullied at school, making them not want to eat or participate in any form of physical activity:

It is sad, but my niece told me that she is bullied at school for her weight. Now she does not want to go out and play that much.

Time was another major barrier that was mentioned by both parents and teachers:

My busy schedule is a large barrier for eating healthy. I do not have time to cook, but I would love to cook a good meal for my family.

Table 3. Survey questions for expert panel.

1) What sections of the website did you use? Check all that you used.	More Whole Grains; More Fruits and Vegetables; Less Sweet Drinks; Less Screen Time; More Physical Activity; More Family Meals; More Sleep
2) Approximately, how much time did you spend on the website?	... minutes
3) Compared to other sources of nutrition information, please rate our website on the following criteria.	Well-organized; Reliable, accurate information; Attractive; Easy to use/navigate to all parts; Easy to read; Enjoyable; Provides helpful information
4) Do you think the content on the website is appropriate for Head Start Parents? Please provide examples of website content that were appropriate or easy to understand/not appropriate or not easy to understand.	...
5) Please tell us what can be done to improve the quality and quantity of the information on our website	...
6) Please tell us what can be done to encourage parents to use our website
7) Is there anything else that you would like to tell us that could improve the website?	...

I am tired by the time I get home, and most of the days I do not have the time to cook. It is so much easier to pick up McDonald's drive-thru than worry about making dinner after coming home.

A teacher said:

Parents do not have time after a long day of work. The only way they can get things done quicker at home is by letting their kids watch TV.

Resources needed. The majority of the parents were interested in the idea of having a website that provides information and resources to help their children have healthier habits.

Website is a great idea. I would definitely use it, but I fear that most parents may not have Internet access.

Parents mentioned that they frequently browse the Internet for recipes and nutrition-related information, but they do not know where exactly to go. They were interested in using a website that has all the information at one place.

There are a million websites out there. How do you know which one is good?

Most of the parents said they would use the website if it was updated regularly with new information and thought monthly newsletters with updates would be helpful.

I would definitely use it if it is updated regularly and has useful information.

Some parents suggested that text messages with updates be sent when new information is added to the website.

Overall, parents said they would definitely use a website with nutrition information if it was easy to use with simple language and short sentences: *I get lost when I read information with a lot of scientific terms. The website needs to be simple and easy to read I think.* Similarly, a teacher said: *A website is not going to be helpful if it is not user friendly. It would be helpful if the website layout is straight forward and contains useful information that can be archived.*

Besides the website, a parent mentioned:

I like cooking demos and home exercising videos since I do not have time for any physical activity.

Some parents preferred monthly meetings with parents over the website as they thought interacting often would help parents to share ideas rather than just reading information from the website.

Meetings like this (group discussion) every month would be very nice. We can discuss and share so many ideas here.

Teachers felt that sending out newsletters to parents on a weekly basis could help parents.

Newsletters to send to parents or information on website would be helpful. Research based information would be helpful like sleep hours, calories per day needed.

One teacher said: *I feel that most of the parents do not have Internet or computers. Sending newsletters with nutrition information to their homes would be more helpful than just a website.* However, one parent stated, *Monthly newsletter will be good. But some parents just don't care; they toss the newsletters and don't even look at them*

Parents mentioned that they wanted to learn more information on local event calendars, and information on available parks and walking trails to help them plan outdoor activities with their children.

Skills needed

Parents suggested that skills related to planning meals ahead and cooking them over the weekend and freezing them can help their family eat healthier.

By the time I get home it is 7 or 8, I cook fast and have them go to bed. I do not have time to cook healthy meals, and we eat out. I was thinking of cooking ahead of time and freezing food.

For increasing physical activity, parents mentioned that learning about creative ways to engage their children both indoors and outdoors can be helpful.

Sometimes we just go to the mall play area if it's too hot. We just let them play. I really need more ideas.

Also, parents felt that by following a set schedule at home, children can get enough sleep. One of the parents mentioned:

We realized that removing the TV from my child's bedroom made her go to bed sooner.

Reinforcing: Encouragement needed related to the 7 healthy habits

Overarching theme: Teachers and parents acknowledged that role modelling of healthy habits by the parents was important to encouraging children to engage in healthy habits. Barriers to parents being role models can be that they don't like the Healthy Habits themselves, or they don't have adequate knowledge about the Healthy Habits. Parents may benefit from interaction with other parents who are successful role models.

Some parents in each FGD mentioned that lack of role modelling of healthy habits was a major contributing factor: *If you don't like certain vegetables, you are likely not going to feed (them to) the kids.*

Another parent mentioned: *Interacting with fellow parents and having group discussions could help parents share information and try new things to reduce children's health problems.*

Teachers believed that due to parents' lack of knowledge about nutrition, they aren't role models for children for healthy habits. *Nobody is being role models to them. Teenage parents or grandparents are trying to raise kids. They eat out by drive-thru at McDonald's and eat in the car.*

A summary of the FGD results related to predisposing, enabling, and reinforcing factors in the PPM is shown in Figure 1.

Website creation and overview

While some parents and teachers in the FGD expressed concerns about parental Internet access, the authors pursued the development of the *Jump2Health Website*TM for the following reasons: i) concern was also expressed by the FGD participants about the lack of effectiveness of traditional methods of education, including print materials such as newsletters; ii) e-Health overcomes some challenges of traditional in-person education methods such as time conflicts; iii) parents in the FGD are already using the Internet to access health information and recipes, thus showing interest and feasibility; iv) Internet access is increasing rapidly with the prevalence of smart phones across all income levels³⁰ and v) health professionals are encouraged to develop and evaluate e-Health as an option that may be effective and feasible for consumers.^{18,31}

Based on the input from parents and teachers in Phase I, the *Jump2Health Website*TM featuring the 7 Healthy Habits was developed by the multidisciplinary team. Best practices for technology (user-friendliness with regard to consistent navigation and layout features (across each Healthy Habit) and health education (appeal through the use of color pictures and non-technical language)³² were used. Across the 7 Healthy Habits, the reading level ranged

from a grade level of approximately 6th grade to 9th grade, with an average of 8th grade. The *Website* was designed to include components that are enabling and motivating, such as descriptions of health benefits to achieving the desired behaviours (7 Healthy Habits), short videos on easy meal preparation, and tip sheets on how to achieve the 7 Healthy Habits in easy and economical ways. Features of the *Website* included tabs for each of the 7 Healthy Habits highlighting importance, recommendations, and tips and strategies. For content, the *Website* utilized national guidelines and reputable information related to nutrition, physical activity, health, and child development, from sources such as www.fns.usda.gov, www.fruitsandveggiesmorematters.org, and www.kidshealth.org. In addition, a link to > 100 cooking videos developed by Texas AgriLife Extension was included (<https://www.youtube.com/user/txdinner/playlists>).

Each Healthy Habit had a similar format to increase ease of use as follows: i) Why that Healthy Habit is important, citing a few statistics about the percent of children who are not following the recommendations; ii) Quantifying the Healthy Habit in terms of amounts recommended; and iii) Strategies to aid parents in implementing the Healthy Habit and overcoming barriers. Using the sleep Healthy Habit as an example, the sleep section included the impact of sleep on health, statistics of children falling asleep in class, steps to determine if a child is sleeping enough, sleep recommendations for preschool children, strategies for parents to encourage adequate sleep, and other resources (information about nightmares, recommended bedtime books, and special tips for children with Attention Deficit Hyperactivity Disorder). Figure 2 shows the

homepage for the 7 Healthy Habits on the *Jump2Health Website™* with Whole Grains featured.

Phase II

To evaluate the accessibility and acceptability of the initial version of the *Jump2Health Website™*, feedback from parents, teachers, and an expert panel was obtained.

Parent Feedback

Five female Head Start parents who participated in the FGD also participated in the phone interviews. The questions asked in the interview related to where the *Website* was accessed, time spent using the *Website*, questions about the interest and usefulness of information in each of the 7 Healthy Habits, and overall appeal and acceptability of the *Website*. Four parents said that they spent 30 minutes or less viewing the *Jump2Health Website™* whereas one parent spent more than 60 minutes. Three parents accessed the *Website* using a personal laptop/computer, and two parents accessed the *Website* using their smart phones. When asked about where they get their nutrition or health information from, three parents mentioned the Internet, one parent mentioned magazines, and one other parent mentioned books. Other sources mentioned by the parents included school cafeteria, food stamp office, brochures through the mail, and paediatrician. All of the parents thought that the *Website* was helpful to them. One of the parents said:

I don't have to wait till I see my doctor. I can just click on this, and I can get what I need, since I don't have WIC (Special Supplemental Nutrition Program for Women, Infants, and

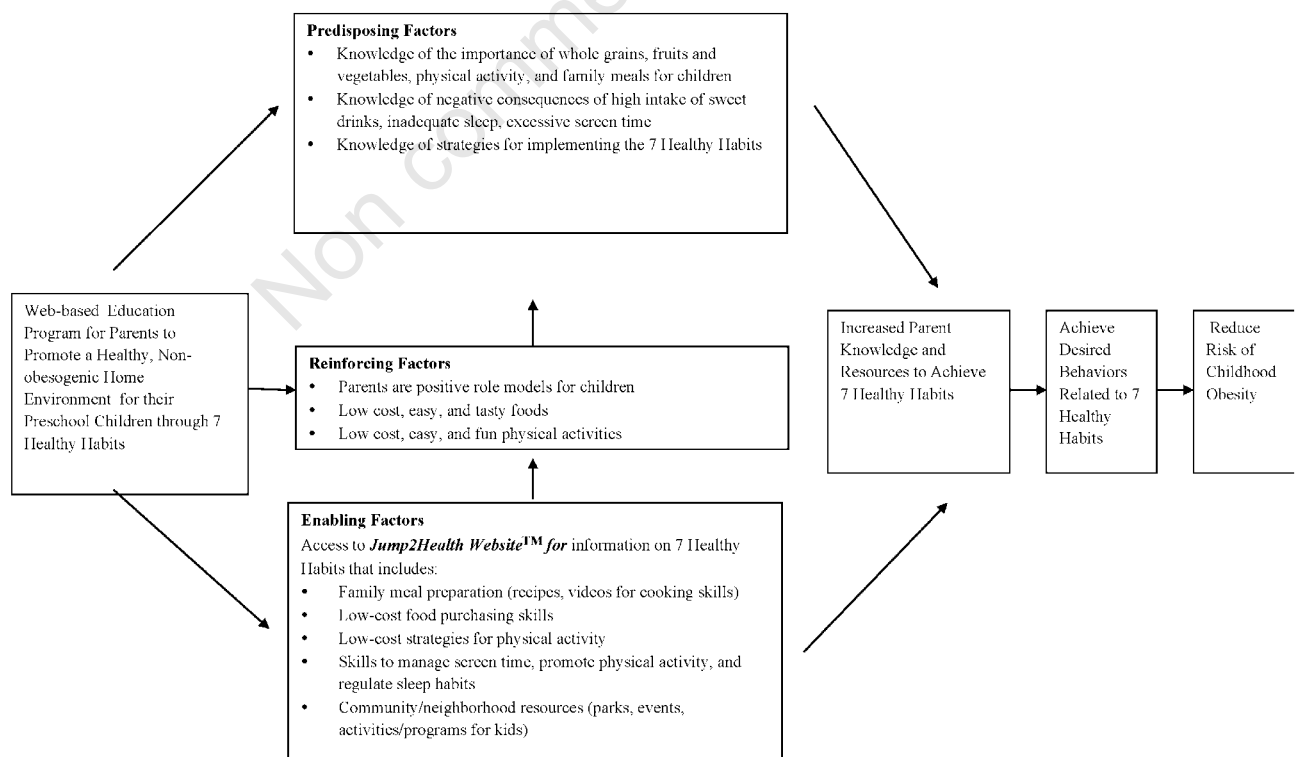


Figure 1. Precede-Proceed model to meet the needs of parents in creating a healthy, non-obesogenic home environment for preschool children.

Children) any more for asking questions. I don't like to just call and ask my doctor, and I wouldn't know where else to go. Sometimes you can go to websites for different things, but with this, all are here so you don't have to go other places.

When asked about how the *Jump2Health Website*TM compared to other sources of nutrition information, all five parents thought it was well organized, provided reliable and accurate information, was easy to use and read, and accessible. Four out of five parents reported that the *Website* was attractive and enjoyable.

The possible reasons that would discourage parents from using the *Website* were: four parents mentioned inability of other parents to access the Internet; two mentioned lack of time; one parent mentioned that the *Website* was not appealing; and one mentioned that they are not interested. Below are a few comments from parents:

I can only access the Internet at work or when I go to library on Saturdays.

It would be good to have recipes pertaining to whole grains that are fun for kids.

When asked why they were interested in using the *Website*, parents mentioned that they used the *Website* for recipes and kids' games. Parents also said that they were interested in learning nutrition information for their kids and to follow healthy habits in their family.

Parents considered the *More Fruits and Vegetables* section as the most helpful section. For the *More Whole Grains* section, they said it was helpful to know what foods are considered whole grains and the amount their child should eat. However, they mentioned that there was too much text in the Whole Grains section. For the *Less Screen Time* section, parents said that they already knew most of information. Parents indicated that the *More Family Meals* section was helpful as they learned the importance of eating together

as a family. In response to the *More Sleep* section, parents mentioned that they really found this section helpful and will start to pay attention to this.

Overall, four parents said that they feel more knowledgeable after visiting the *Website*, but only two parents mentioned that they felt motivated to start implementing the 7 Healthy Habits after viewing the *Website*. This may reflect the responses of three parents who indicated that they already have been following these recommendations.

All the parents agreed that the *Website* provided enough information for them in general to make informed decisions. However, one parent stated, *I feel like I need more details. Especially for the obesity part, my daughter doesn't eat much, but she is on the hefty side. I want more information about that. She does drink Coke and eat candy.*

In response to *Which parts of the Website encouraged you to think about making changes?* parents mentioned that the physical activity and sleep sections encouraged them to make changes. Also, when asked if they made any changes after using the *Website*, some parents mentioned that they now encourage kids to play outside more often instead of video games and now buy more whole grain foods; however, one parent said that she hadn't made any changes.

When asked if they would return to the *Website*, four out of five said they would, and all the parents mentioned that they are likely to recommend the *Website* to other parents as they felt they would benefit. One of the parents mentioned that:

Most parents are embarrassed to ask their doctors or paediatrician questions. They feel like they are asking too many questions and may feel dumb. By accessing the Website, they can feel more comfortable in finding answers and understand the information better.

Jump2Health Website



Figure 2. Sample Webpage from the *Jump2Health Website*TM Developed from Phase I Focus Group Discussions with Head Start Parents and Teachers.

Teacher feedback

Six Head Start teachers who participated in the FGD also participated in the phone interviews to provide an evaluation of *Jump2Health Website™*. Four teachers indicated that they spent about 30 minutes or less viewing the *Website* whereas two teachers spent 31-90 minutes. All the teachers accessed the *Website* using a personal laptop/computer at their school. When asked about where they usually get their nutrition or health information from, three teachers mentioned the Internet, one teacher mentioned magazines, and two teachers mentioned books.

When asked how the *Website* compared to other sources of nutrition information, all the teachers thought it was well organized, contained reliable and accurate information, and was easy to use and read, attractive and enjoyable. This is best captured by this teacher's comment:

I think the Website is well organized and easy to read. If parents follow it, it will be a useful resource to them.

The possible reasons that would discourage parents from using the *Website* as mentioned by the teachers were: inability to access the Internet, lack of time, and lack of interest.

In response to the *Less Screen Time* section, teachers mentioned that children today are getting a lot of screen time with playing games on smart phones and tablets, and this section will be good for parents to learn about screen time and encourage their children to play outside. For the *More Family Meals* section, teachers thought it would be helpful to parents, especially the cooking videos that were available. Related to the *More Sleep* section, teachers felt that this section had good information needed by parents all in one location.

Overall, the teachers felt that the *Website* provided information related to their health concerns about children in their classrooms and provided enough information for parents to make informed decisions. In addition, they felt more knowledgeable about the 7 Healthy Habits related to obesity prevention after visiting the *Website*. When asked if they would return to our *Website*, all the teachers said they would, and they were also willing to share it with fellow teachers at their schools. All of the teachers wanted to be notified about future updates to the *Website*.

During the interviews, it was evident that not all of the parents and teachers read or viewed each of the 7 Healthy Habits sections completely. Consequently, some mentioned that it would be helpful if recipes and cooking videos were included in the *Website* even though these were already there.

Expert panel feedback

Five RDNs, each with more than 2 years of professional experience, participated in our online survey. Compared to other nutrition information sources, all of the RDNs agreed that the *Website* was well-organized, easy to use, attractive, easy to read, enjoyable, and provided helpful, reliable, and accurate information.

In response to the question: *Do you think the content is appropriate for parents and teachers?* they said:

The majority of the information is really good, but I think that some of it gets a little bit too wordy.

Absolutely! I particularly liked the information in 'the Less Sweet Drinks' section. The information was put into very understandable language that parents, health providers, and teachers will be able to utilize. I found each section to have very credible and useful information for teachers, parents, and RDNs alike!

The Website is very user friendly. The tabs along the side are easy to navigate and make sense. The links provided are excellent and varied. I also like that there are several videos and recipes. As

a nutrition professional, I have many clients asking for recipes. This is a very useful, well designed site that I will refer my patients (especially parents and kids).

Discussion

To create education materials and methods that are appropriate and appealing, continuous involvement with stakeholders throughout the development and testing process is important.³¹ FGD have been used in a variety of studies with stakeholders (parents or parents and teachers) to inform the development of preschool childhood obesity prevention programs delivered via traditional modes of face-to-face and print.^{21,23} However, only one other study was found that solicited input from parents and teachers (home visitation staff) to guide the development and initial testing of obesity prevention materials aimed at preschool parents that included an electronic component.³³ Specifically, the HomeStyles study's materials were designed to be used electronically by parents or face-to-face with home visitation staff. Currently, a randomized control trial is being conducted with a web-based version of the HomeStyles program.²⁴ Thus, despite the dramatic increase in Internet use, our study is apparently only one of a few to use formative research with parents and teachers to guide the development of an e-learning program (website) for obesity prevention in preschool children using a comprehensive set of 7 Healthy Habits. The Phase I FGD results were used to develop the *Jump2Health Website™*, and Phase II results evaluated the *Website*.

Phase I needs assessment

To assess the educational needs of parents with preschool children, related to providing a healthy, non-obesogenic home environment, parents and teachers at a local Head Start Program participated in FGD. Our findings are similar to other FGD with parents of preschoolers, suggesting common barriers related to healthy behaviours, including perceived lack of time and money, lack of knowledge about food preparation, and lack of strategies for picky eaters and concern for neighbourhood safety.³³⁻³⁵ Although not specifically found in our FGD, parents of preschoolers in other studies mentioned that they had difficulty enforcing rules about some healthy behaviours because they had negative childhood memories, such as being denied foods, and not wanting to do that to their children,³⁵ or working parents feeling guilty about the limited time they had with their children in the evenings so they allowed their children to stay up later.³³ Teachers in our study saw the negative consequences of these parental behaviours in the types of foods their children brought to school and in children falling asleep in their desks. The need for information on parenting skills for healthy behaviours and the importance of parents being role models was a common finding in our FGD and in qualitative research with parents and other stakeholders.³³⁻³⁵

Parents' perceived impressions related to healthy habits may be *internal barriers*. Internal barriers include a variety of thoughts and emotions that individuals identify as reasons why making behavioural health changes are difficult.³⁶ As they relate to this study, internal barriers may be perceived impressions that discourage certain healthy habits, regardless of whether the impressions match reality, such as cooking healthy meals takes too much time, or being physically active costs too much or is time consuming. Although some healthy foods are expensive, a parent's perceived impression that all healthy foods are too expensive may be an unnecessary internal barrier that keeps the parent from making dietary improvements. The perception that in order for children to

be physically active, they should participate in extra-curricular sports is an unnecessary internal barrier, as parents can be informed about low-cost options, including those that parents and children can do together. Educators need to consider parents' perceptions and internal barriers when planning lifestyle change interventions.²⁴ Therefore, in our *Website* development, we included food preparation videos featuring low-cost, healthy, and easy-to-prepare meals, and information on low cost versions of healthy foods, such as canned and frozen fruits and vegetables, to help reduce barriers to healthy food intake. For bad weather days or when outside play/use of parks is not feasible or safe, we also included ideas for indoor activities that parents can do with their children, such as dancing.

Phase II Evaluation of Jump2Health Website

Telephone interviews were conducted to obtain parents' and teachers' feedback as part of beta testing the *Jump2Health Website*TM. Overall, parents and teachers thought the *Website* was a helpful resource, appealing, and well organized. It was also found that most of the parents were very interested in the recipes and videos related to the 7 Healthy Habits, yet they had difficulty finding them in the different Healthy Habit sections. The interviews provided in depth qualitative responses that went beyond what could be learned from a quantitative survey. For example, the comment by one parent showed advantages of the *Website* in accessing information that they may not have felt comfortable asking health care providers and being able to *digest* the information at their own pace. Thus, online education has the potential to overcome barriers to health information that have been reported by other Head Start parents.³⁴

It is important to note that only two of the five parents mentioned that they felt motivated to start implementing the 7 Healthy Habits after viewing the *Website*. As mentioned in the results, this may reflect the responses of three parents who indicated that they already have been following these recommendations. However, it also shows the challenges of health education, even with a stakeholder-driven, theoretically-based intervention. Individual, social, and cultural barriers to Internet use may affect its effectiveness; these barriers should be further explored.¹⁸

In addition to parent and teacher feedback, the expert panel validated the accuracy of the content and overall appeal and usefulness of the format of the *Jump2Health Website*TM. The panel liked the cooking videos, recipes, and easy navigation. Interviews with nutrition education experts in Georgia also suggested the value of these in eLearning platforms for consumers with limited resources.³⁷ They suggested that motivation may be the most important barrier to eLearning in low-income audiences, not lack of access to the Internet or limited literacy. This is supported by two statements in our FGD's: *But some parents just don't care* (parent) and *If parents follow it, it will be a useful resource to them* (teacher).

Overall, the Phase II beta-testing was very helpful to evaluate the *Website* and incorporate stakeholder feedback prior to additional development and testing on a larger scale. Some concern was mentioned by parents and teachers regarding Internet access by parents. Previous research in low-income adults found that approximately 50% of the respondents (n=1620) indicated that they had a working computer in their home, and of those, the majority (78%) had a high-speed Internet connection.³⁸ Chi-square analysis revealed that younger adults who were white and had more education were more likely to have a computer (P<0.001) and Internet. Thus, while web-based education may meet the needs of an increasing number of parents, access to the Internet may be a barrier for others. Also, it is important to consider that some parents

and teachers in our study felt that parents would benefit from in-person group discussions and access to printed material, possibly as additional educational options.

Changes made as a result of Phase II

To address the feedback obtained in Phase II, the text throughout the *Website* was shortened where possible, and a *read more* button was added to all 7 Healthy Habit sections to allow the user to read additional information if interested in that topic. Separate buttons for the videos and recipes were added to the homepage, to provide easy access to the parents, in addition to being included within the 7 Healthy Habit sections. Two additional buttons were added to the *Website* to include information on childhood obesity and strategies for parents to encourage a positive self-image in their children to address concerns about bullying. Changes to the *Jump2Health Website*TM to address motivation are on-going, including the development of a discussion blog for parents and a Pinterest-like section for parents to post successes related to the 7 Healthy Habits, and thus provide role models/encouragement to parents. Also, a mobile *Jump2Health Website*TM for smart phones is being developed by the authors to provide more access to parents who may not have access to a personal computer.

Strengths and limitations

A strength of this study is its intervention focus on obesity prevention in the preschool child using e-Health. In recognition of the undesirable obesity levels in the preschool population and undesirable health behaviours starting at an early age, the preschool age is an important priority. Analysis of data from the national Early Childhood Longitudinal Study found that the incidence of obesity between the ages of 5 and 14 years was 4 times higher among children who had been overweight at 5 years of age compared to children who had a normal weight at the same age.³⁹

Another strength of this study was that the *Jump2Health Website*TM content and features were developed by a multidisciplinary team using formative evaluation (input from parents and teachers) and beta testing (parents, teachers and expert panel). The use of all three stakeholder groups provided a more comprehensive evaluation than just relying on either parents, teachers, or expert panel only, during the development process. This allows comparisons to be made across the stakeholder groups to improve credibility and dependability, as was also found by Boddy and co-authors (2012) with their qualitative study that included parents, teachers, and elementary aged children.²⁷ Also, the content of the *Jump2Health Website*TM, organized as 7 Healthy Habits, was based on current best practices and evidence analysis, including new factors related to childhood obesity, such as sleep.^{7,8} Other obesity prevention research involving parents of preschool children has included only one or a few healthy habits simultaneously, such as a program focusing on fruits, vegetables, and whole grains⁴⁰ and a program focusing on sugar-sweetened beverage and juice intake.⁴¹ Of these, only the latter program was designed to be delivered by e-Health.

This study is subject to limitations inherent in qualitative research and is not generalizable to other contexts and settings. The study samples of parents and teachers were self-selected from Head Start classrooms in only one school district. Parents who participate in health programs may have a greater interest in learning about health for their children and different challenges and resources than non-participants.⁴² Further, the 20 parent participants in Phase I included only 1 father so it is not known if other fathers in this Head Start program would have different knowledge or resource needs related to the PPM predisposing, enabling, or reinforcing factors. We don't know the reasons for non-participa-

tion of parents in Phase II; perhaps the parents who didn't participate in Phase II lacked access to the Internet which reinforces the need to explore *one size doesn't fit all*.

Conclusions

Two phases of formative evaluation were used to guide the content and design of the *Jump2Health Website*[™] for parents of preschool children in Head Start. Our findings have complemented and extended the understanding of consumer-led research priorities to develop website education tools for obesity prevention in a high priority population of preschool children.

The *Jump2Health Website*[™] is promising as it shows that parents with low-income were able to access the *Website* and found it to be appealing and helpful. However, the *Jump2Health Website*[™] may not be feasible and effective with all preschool parents with low-income, but may serve as a valuable adjunct or option to traditional parent meetings and newsletters.

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References

- Ogden CL, Carroll MD, Kit BK, et al. Prevalence of childhood and adult obesity in the United States, 2011-2012. *JAMA* 2014;311:806-14.
- Centers for Disease Control and Prevention (CDC). Vital signs: obesity among low-income, preschool-aged children: United States, 2008-2011. *MMWR Morb Mortal Wkly Rep* 2013;62:629-34.
- Fryar CD, Carroll MD, Ogden CL, et al. Prevalence of obesity among children and adolescents: United States, trends 1963-1965 through 2009-2010. Available from: <http://www.nccpeps.com/ContinuityModules-Fall/Fall%20Continuity%20Source%20Materials/Obesity-2009-10%20Trends.pdf> (2012, accessed 27 June 2017).
- Barr-Anderson DJ, van den Berg P, Neumark-Sztainer D, et al. Characteristics associated with older adolescents who have a television in their bedrooms. *Pediatrics* 2008;121:718-24.
- Davis AM, Befort C, Steiger K, et al. The nutrition needs of low-income families regarding living healthier lifestyles. Findings from a qualitative study. *J Child Health Care* 2013;17:53-61.
- Hammons AJ, Fiese BH. Is frequency of shared family meals related to the nutritional health of children and adolescents? *Pediatrics* 2011;127:e1565-74.
- Landhuis CE, Poulton R, Welch D, et al. Childhood sleep time and long-term risk for obesity: A 32-year prospective birth cohort study. *Pediatrics* 2008;122:955-60.
- Mitchell JA, Rodriguez D, Schmitz KH, et al. Sleep duration and adolescent obesity. *Pediatrics* 2013;131:e1428-34.
- Spear BA, Barlow SE, Ervin C, et al. Recommendations for treatment of child and adolescent overweight and obesity. *Pediatrics* 2007;120:S254-88.
- Welsh JA. Overweight among low-income preschool children associated with the consumption of sweet drinks: Missouri, 1999-2002. *Pediatrics* 2005;115:e223-9.
- Ontai L, Ritchie LD, Williams ST, et al. Guiding family-based obesity prevention efforts in low-income children in the United States. Part I: What determinants do we target? *Int J Child Adolesc Health* 2009;2:19-30.
- Andrews KR, Silk KS, Eneli IU. Parents as health promoters: a Theory of Planned Behavior perspective on the prevention of childhood obesity. *J Health Commun* 2010; 15: 95-107.
- Taylor T, Serrano E, Anderson J. Management issues related to effectively implementing a nutrition education program using peer educators. *J Nutr Educ* 2001;33:284-92.
- Baker CN, Arnold DH, Meagher S. Enrollment and attendance in a parent training prevention program for conduct problems. *Prev Sci* 2011;12:126-38.
- Davis DW, Logsdon MC, Jones VF, et al. First we have to engage them: A mixed methods assessment of low-income parents' preferences for and barriers to receiving child health promotion information. *J Pediatr Health Care* 2015;29:501-8.
- Reed DB. Focus groups identify desirable features of nutrition programs for low-income mothers of preschool children. *J Am Diet Assoc* 1996;96:501-3.
- Perrin A, Duggan M. Pew Research Center. Americans' Internet Access: 2000-2015. Available from: <http://www.pewinternet.org/2015/06/26/americans-internet-access-2000-2015/> (26 June 2015, accessed 24 September 2017).
- Vandelanotte C, Müller AM, Short CE, et al. Past, present, and future of eHealth and mHealth research to improve physical activity and dietary behaviors. *J Nutr Educ Behav* 2016;48:219-28.
- Neuenschwander LM, Abbott A, Mobley AR. Comparison of a web-based vs in-person nutrition education program for low-income adults. *J Acad Nutr Diet* 2013;113:120-6.
- Swindle TM, Ward WL, Whiteside-Mansell L, et al. Technology use and interest among low-income parents of young children: differences by age group and ethnicity. *J Nutr Educ Behav* 2014;46:484-90.
- Manios Y, Grammatikaki E, Androutsos O, et al. A systematic approach for the development of a kindergarten-based intervention for the prevention of obesity in preschool age children: the ToyBox-study. *Obes Rev* 2012;13:3-12.
- Bergström H, Haggård U, Norman Å, et al. Factors influencing the implementation of a school-based parental support programme to promote health-related behaviours: interviews with teachers and parents. *BMC Public Health* 2015;15:541.
- McGarvey EL, Collie KR, Fraser G, et al. Using focus group results to inform preschool childhood obesity prevention programming. *Ethn Health* 2006;11:265-85.
- Byrd-Bredbenner C, Martin-Biggers J, Koenings M, et al. HomeStyles, a web-based childhood obesity prevention pro-

- gram for families with preschool children: protocol for a randomized controlled trial. *JMIR Res Protoc* 2017;6:e73.
25. Green LW, Kreuter MW. Health promotion and a framework for planning. In: *Health Promotion Planning: An Educational and Environmental Approach*. Mayfield, 1999, pp. 1-49.
 26. Green L. Published Applications of the Precede Model. <http://lgreen.net/precede%20apps/preapps-NEW.htm> (2017, accessed 16 September 2017).
 27. Boddy LM, Knowles ZR, Davies IG, et al. Using formative research to develop the healthy eating component of the CHANGE! school-based curriculum intervention. *BMC Public Health* 2012;12:710.
 28. Gielen A, McDonald E, Gary T, et al. Using the PRECEDE-PROCEED Model to apply health behavior theories, Chapter 18. In: Glanz K, Rimer B, Viswanth K, eds. *Health Behavior and Health Education. Theory, Research, and Practice*. Jossey-Bass publishers, 2008, pp. 407-433.
 29. Weir C, McLeskey N, Bruncker C, et al. The role of information technology in translating educational interventions into practice: an analysis using the PRECEDE/PROCEED model. *J Am Med Inform Assoc* 2011;18:827-34.
 30. File T, Ryan C. Computer and Internet use in the United States: 2013. U.S. Census Bureau. Available from: <https://www.census.gov/content/dam/Census/library/publications/2014/acs/acs-28.pdf> (2014, accessed 18 August 2016).
 31. Kreps GL, Neuhauser L. New directions in eHealth communication: opportunities and challenges. *Patient Educ Couns* 2010;78:329-36.
 32. United States Department of Agriculture, United States Department of Agriculture (USDA). Criteria for the development and evaluation of electronic-based nutrition education for WIC participants. Available from: http://www.nal.usda.gov/wicworks/Learning_Center/criteria_electronic.pdf (2004).
 33. Martin-Biggers J, Spaccarotella K, Hongu N, et al. Translating it into real life: a qualitative study of the cognitions, barriers and supports for key obesogenic behaviors of parents of preschoolers. *BMC Public Health* 2015;15:189.
 34. Fleary SA, Ettienne-Gittens R, Heffer RW. Perceptions of preventive health care and healthy lifestyle choices for low income families: a qualitative study. *ISRN Prev Med* 2013;2013:e189180.
 35. Herman AN, Malhotra K, Wright G, et al. A qualitative study of the aspirations and challenges of low-income mothers in feeding their preschool-aged children. *Int J Behav Nutr Phys Act* 2012;9:132.
 36. Pender N, Murdaugh C, Parsons M. *Health promotion in nursing practice*. 6th ed. Upper Saddle River, NJ: Prentice-Hall, 2011.
 37. Stotz S, Lee JS, Rong H, et al. The feasibility of an eLearning nutrition education program for low-income individuals. *Health Promot Pract* 2017;18:150-7.
 38. Neuenschwander LM, Abbott A, Mobley AR. Assessment of low-income adults' access to technology: implications for nutrition education. *J Nutr Educ Behav* 2012;44:60-5.
 39. Cunningham SA, Kramer MR, Narayan KMV. Incidence of childhood obesity in the United States. *N Engl J Med* 2014;370:403-11.
 40. Sharma SV, Rashid T, Ranjit N, et al. Effectiveness of the Lunch is in the Bag program on communication between the parent, child and child-care provider around fruits, vegetables and whole grain foods: A group-randomized controlled trial. *Prev Med* 2015;81:1-8.
 41. Nezami BT, Lytle LA, Tate DF. A randomized trial to reduce sugar-sweetened beverage and juice intake in preschool-aged children: description of the Smart Moms intervention trial. *BMC Public Health* 2016;16:837.
 42. Ghai NR, Reynolds KD, Xiang AH, et al. Recruitment results among families contacted for an obesity prevention intervention: The Obesity Prevention Tailored for Health Study. *Trials* 2014;15:463.