

A photograph of a woman and a young child, both smiling and looking towards the camera. The woman is holding the child, and they appear to be outdoors. The image is slightly faded to allow text to be overlaid.

# The Smart Moms Study

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JULY 18, 2016

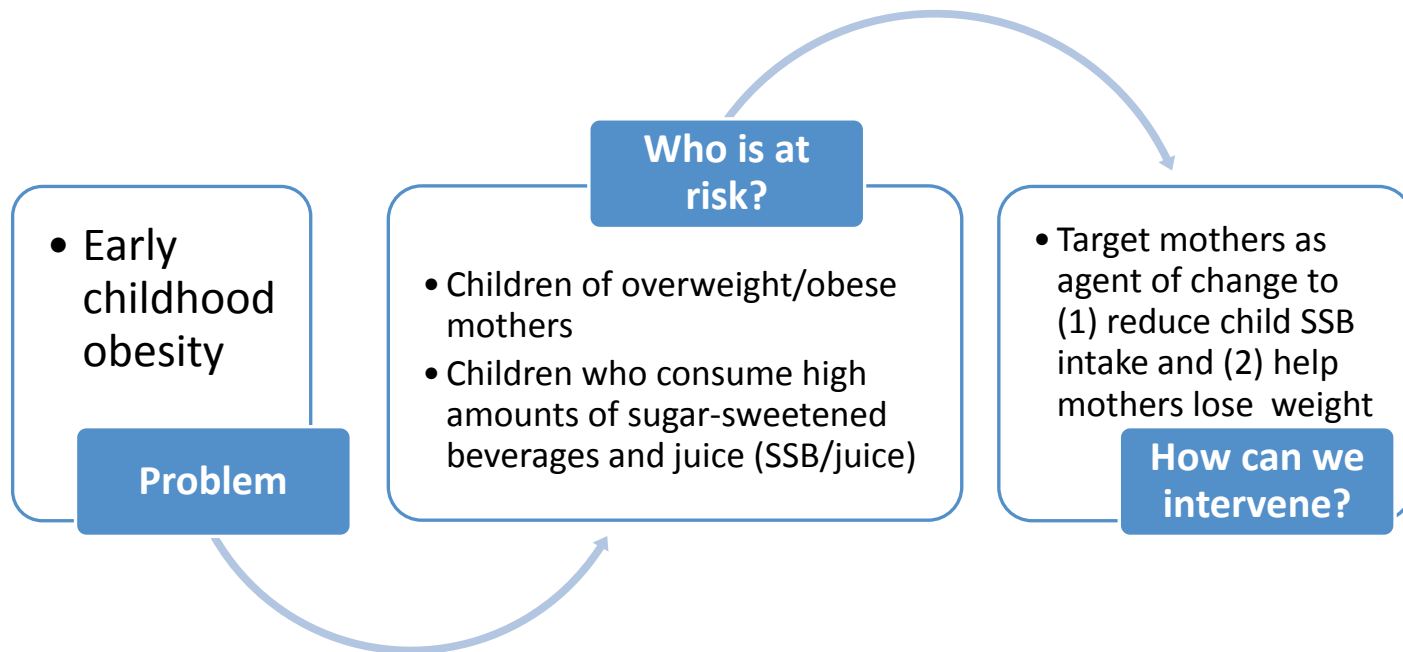


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GLOBAL PUBLIC HEALTH

# Background

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- Primary Research Interest:
  - Family-based interventions to reduce obesity risk in young children



# Key Ingredients

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Target Drivers  
of Child Obesity

Simple Goals



Maximize  
Engagement

# Adapting Standard Intervention

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- Adapt to enhance accessibility and adherence of parents
- Emerging technologies
  - Websites
  - Mobile phones/text messaging
  - Evidence for feasibility among mothers



# Study Design

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- 6-month RCT
  - Smart Moms intervention vs. waitlist control
- Population
  - Mother-child dyads
  - Child ages 3-5
- Primary outcome
  - Child SSB/juice intake
- Secondary outcome
  - Maternal weight



# Eligibility Criteria

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- **Child criteria**

- Ages 3-5
- Consumes at least 12 ounces of SSB/juice per day
- Without medical condition that would affect participation



- **Maternal criteria:**

- BMI of 25-50 kg/m<sup>2</sup>
- Own a smartphone with data and text messaging plan
- Without medical condition that would affect participation



# Recruitment

- Target Area
  - Within 20 miles of Raleigh, Durham, or Chapel Hill
- Traditional Methods
  - UNC informational listserv
  - Flyers in over 75 community locations
  - Letters to 400+ peds offices, daycares, preschools
  - Flyers with WIC staff

**LOSE a little weight, LIVE a lot better!**



Are you a mom of a preschooler?

Do you want to make healthy choices for you and your child?

Sign up for a no-fee research study at the University of North Carolina at Chapel Hill that is designed to help mothers of children ages 3-5 make small behavior changes and lose a little weight. The program will be delivered primarily through online contacts and text messages to fit your busy schedule. More information is available online at [www.smartmomsstudy.org](http://www.smartmomsstudy.org) or call us at 919-966-5852.

Learn more at [www.smartmomsstudy.org](http://www.smartmomsstudy.org)



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Or call us at  
919) 966-5852





# Online Recruitment

- Local parents groups
- Carolina Parent Ad
- Facebook



**UNC Smart Moms Study**  
Sponsored · Edited ·

Researchers at UNC are looking for mothers of young children to take part in a program designed to help them lose a little weight while also promoting the health of their children. The program will be delivered primarily through a website and text messages to fit your busy schedule.

More information is available at [www.smartmomsstudy.org](http://www.smartmomsstudy.org).

**Smart Moms Study**  
Smart Moms is a free research study brought to you by researchers at the University of North Carolina at Chapel Hill. The Smart Moms study is testing an innovative 6-month program to help mothers...

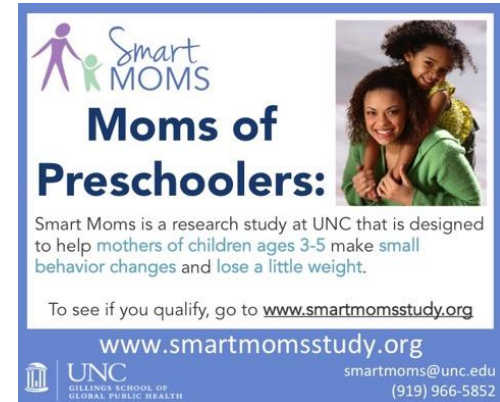
[SMARTMOMSSTUDY.ORG](http://SMARTMOMSSTUDY.ORG)

Unlike · Comment · Share · 192 20 115



**UNC Study for Moms!**  
[smartmomsstudy.org](http://smartmomsstudy.org)

**Moms of preschoolers:**  
Join a study at UNC to make healthy changes and lose some weight!



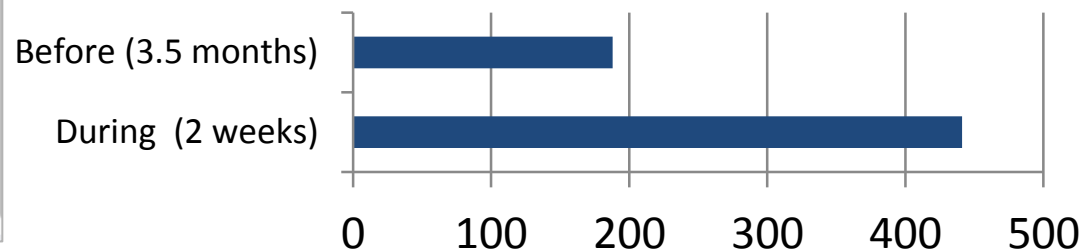
**Smart MOMS**  
**Moms of Preschoolers:**

Smart Moms is a research study at UNC that is designed to help mothers of children ages 3-5 make small behavior changes and lose a little weight.

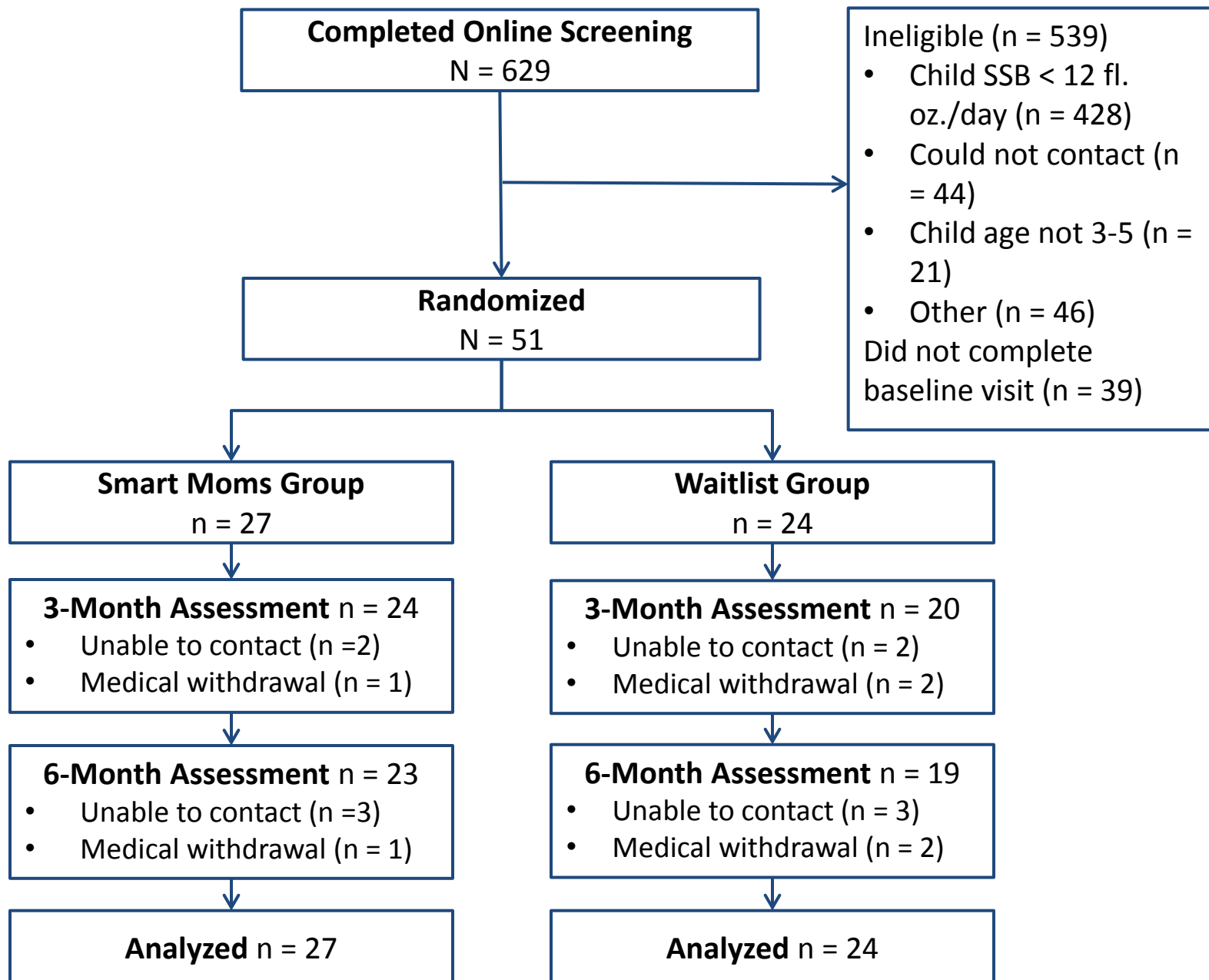
To see if you qualify, go to [www.smartmomsstudy.org](http://www.smartmomsstudy.org)

[www.smartmomsstudy.org](http://www.smartmomsstudy.org)  
UNC GILLESPIE SCHOOL OF GLOBAL PUBLIC HEALTH  
smartmoms@unc.edu  
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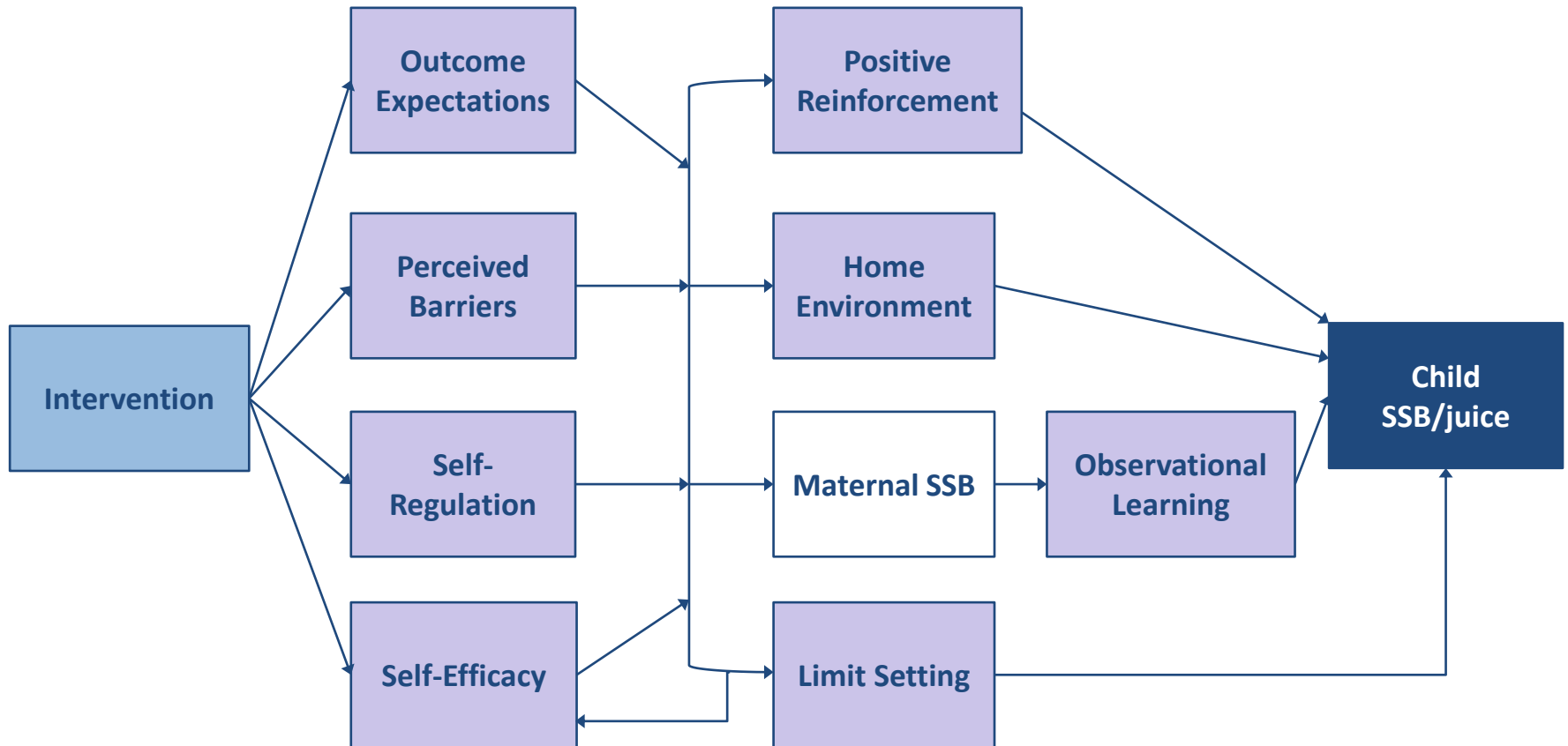
## Screeners Completed Before and After Facebook Post







# Conceptual Model



# Intervention Strategies

Determinant	Strategies
<b>Self-efficacy</b>	Set short-term goals Prompt self-monitoring Provide tailored performance feedback Prompt review of goals
<b>Outcome Expectations</b>	Provide general information about risk of obesity in young children Provide general information on relationship between SSBs and obesity
<b>Perceived Barriers</b>	Prompt barrier identification Provide strategies to overcome barriers Prompt behavior change with cues to action/encouragement
<b>Self-Regulation</b>	Set short-term goals Prompt self-monitoring
<b>Home Environment</b>	Environmental restructuring
<b>Limit Setting</b>	Provide tailored performance feedback Stress management
<b>Positive Reinforcement</b>	Provide contingent rewards Praise child for behavior
<b>Observational Learning</b>	Provide information on mother as behavioral role model for child

# Smart Moms Program Delivery

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# Overview


## • Goals

### Child Goal

- Gradually reduce SSB/juice intake to 4-6 fl. oz./day (1 serving)

### Mother Goals

- Reduce caloric beverage intake to  $\leq 8$  fl. oz./day
- Reduce intake of high-calorie foods ("red" foods)
- Weigh daily



**Traffic Light Food Guide**

Weekly

**Weekly Beverage Goals**

Weeks	10	servings per day
10	10	servings per day
20	10	servings per day
30	10	servings per day
40	10	servings per day
50	10	servings per day
60	10	servings per day
70	10	servings per day
80	10	servings per day
90	10	servings per day
100	10	servings per day
110	10	servings per day
120	10	servings per day

**MOMS!**

- 1 serving of quark or bunsen
- 100% fruit juice
- Fruit drinks
- Milk
- Soda
- Sports drinks
- Energy drinks
- Sweetened water
- Sweetened tea
- Wine
- Beer/Wine/Coolers
- Liquor
- Coffee (total)

**Smart Moms S**

**Week 1!**

**Daily Weighing:** Begin weighing your weight in your Week 1!

**Tracking Beverages:** Begin tracking your child's sugary beverage page (7). Aim to keep beverage own and your child's goals for of your diary!

**Sunday Check-in Text Message:** receive a text message asking that you have been tracking

- 1) **Child's Beverages:** My sugary beverages for the entire week!
- 2) **Mom's Beverages:** My caloric beverages that I consumed for the week!
- 3) **Mom's Weight:** You will report your most recent from your scale at home!!


**Instructions on how to send these text messages are**

**Text Messages:** You can expect to receive approximately messages each week. One will be the Sunday evening some will be tips, others will be motivational messages, and some will ask you to respond to a multiple choice question about your progress that week (see how to send text responses on page 9)!!

**William**

Monday	Tuesday	Wednesday	Thursday	Friday
I drank _____ servings or less of juice and sugary beverages today!	I drank _____ servings or less	I drank _____ servings or less	I drank _____ servings or less of juice and	I drank _____ servings or less of juice and

**WATER**



# Mobile-Optimized Website

QUESTIONS? EMAIL US!

NEW LESSON FAMILY CORNER FEATURED DRINK PAST LESSONS ABOUT US



## Lesson 18: Staying in Control - Life After Smart Moms

Congratulations on making it to the final week of the Smart Moms program! Smart Moms was uniquely designed to help you make two specific changes that can have a big impact on your weight. During the past 6 months, we have encouraged you to **reduce your beverages to 1 per day** and to **reduce your consumption of red foods**. We also asked that you help your child reduce their consumption of juices and sugary beverages, because that's one simple change that can make their diet healthier and help them stay at a healthy weight.

Although the Smart Moms program is ending, your focus on managing your beverage and food intake doesn't have to end! In this lesson we'll review the specific strategies that we used to target your beverage and red foods intake so that you can continue with your healthy behavior changes. These are basic skills that are essential for adopting habits that you can sustain over a lifetime.

### Strategies for Managing Your Food and Beverage Intake

**1. Self-Monitoring.** Research shows that monitoring your food intake and physical activity are associated with weight loss and weight maintenance. Whether you want to lose more weight or maintain your weight, you will benefit from recording your daily food and beverage intake in a way that works best for you: on paper, or using a calorie tracking website or smartphone application.



AT&T M-Cell 4G 1:29 PM 58% smartmomstudycohort1.weebly.com

## The Culprit: Sugar

Fruit drinks, some juices, and other sugary beverages are high in empty calories, and most provide little or no nutrients. However, the biggest concern for your child's health is the high levels of sugar they contain.

Research has shown that:

CHILDREN ≥ 2 YEARS OLD CONSUME <b>83 MORE CALORIES</b> OF ADDED SUGAR PER DAY THAN IN 1977	<b>48%</b> OF CHILDREN'S ADDED SUGAR INTAKE COMES JUST FROM <b>BEVERAGES</b>
CONSUMPTION OF SUGARY BEVERAGES BEGINS AS EARLY AS INFANCY, AND RISES AS CHILDREN GROW OLDER, WITH A <b>SHARP INCREASE</b> AT THE AGE OF <b>8</b>	CHILDREN AGES 2-5 ARE <b>RECOMMENDED</b> TO CONSUME ONLY <b>4 TSP OF ADDED SUGAR A DAY</b> THEY ACTUALLY CONSUME ABOUT <b>13 TSP</b>

Though almost half of children's added sugar intake comes from beverages, the rest of

# Self-Monitoring

- Simplified monitoring



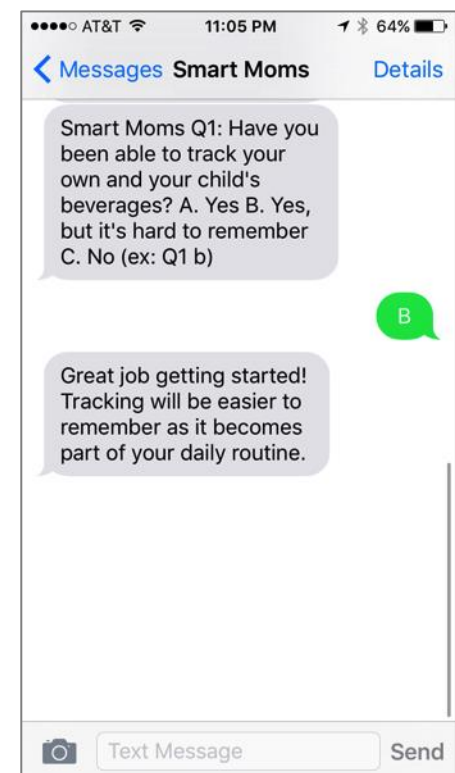
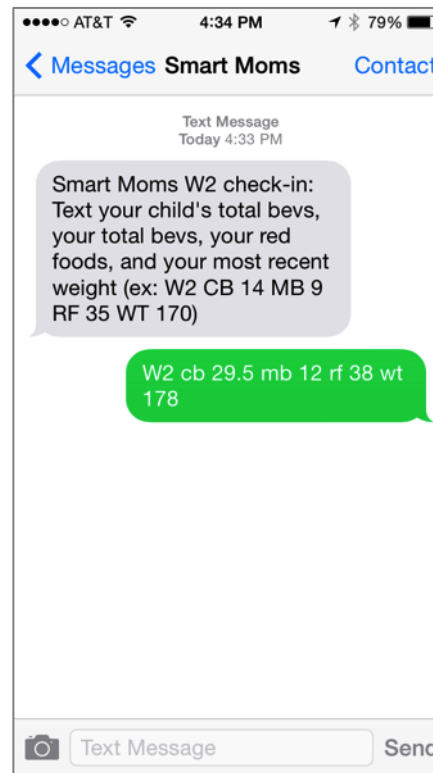
Tuesday			
Child Servings	<input type="checkbox"/>	<input type="checkbox"/>	Total
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
Mom Servings	<input type="checkbox"/>	<input type="checkbox"/>	Total
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
Mom Red Foods	<input type="checkbox"/>	<input type="checkbox"/>	Total
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
Mom Weight: _____ lbs			

Weekly Totals			
Day	Child Servings	Mom Servings	Mom Red Foods
Monday			
Tuesday			
Wednesday			
Thursday			
Friday			
Saturday			
Sunday			
Total			
Mom Most Recent Weight: _____ lbs.			



# Text Messaging

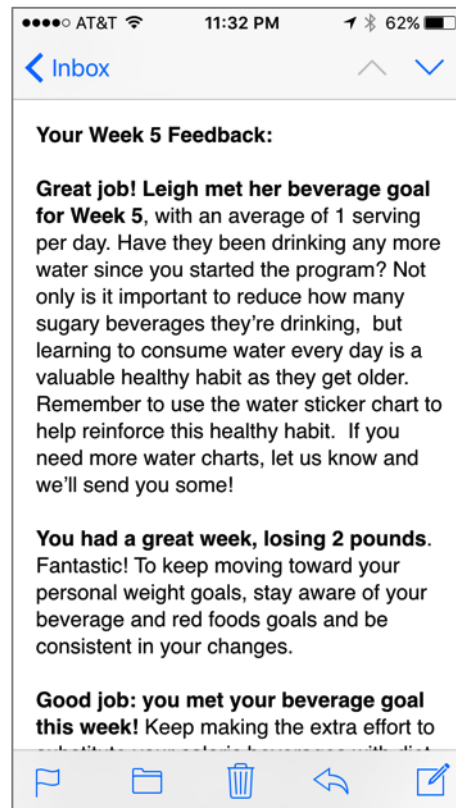
- Self-monitoring prompt
- Lesson prompt
- Assessment of goal progress
- Tips/Motivational messages



# Email Personalized Feedback

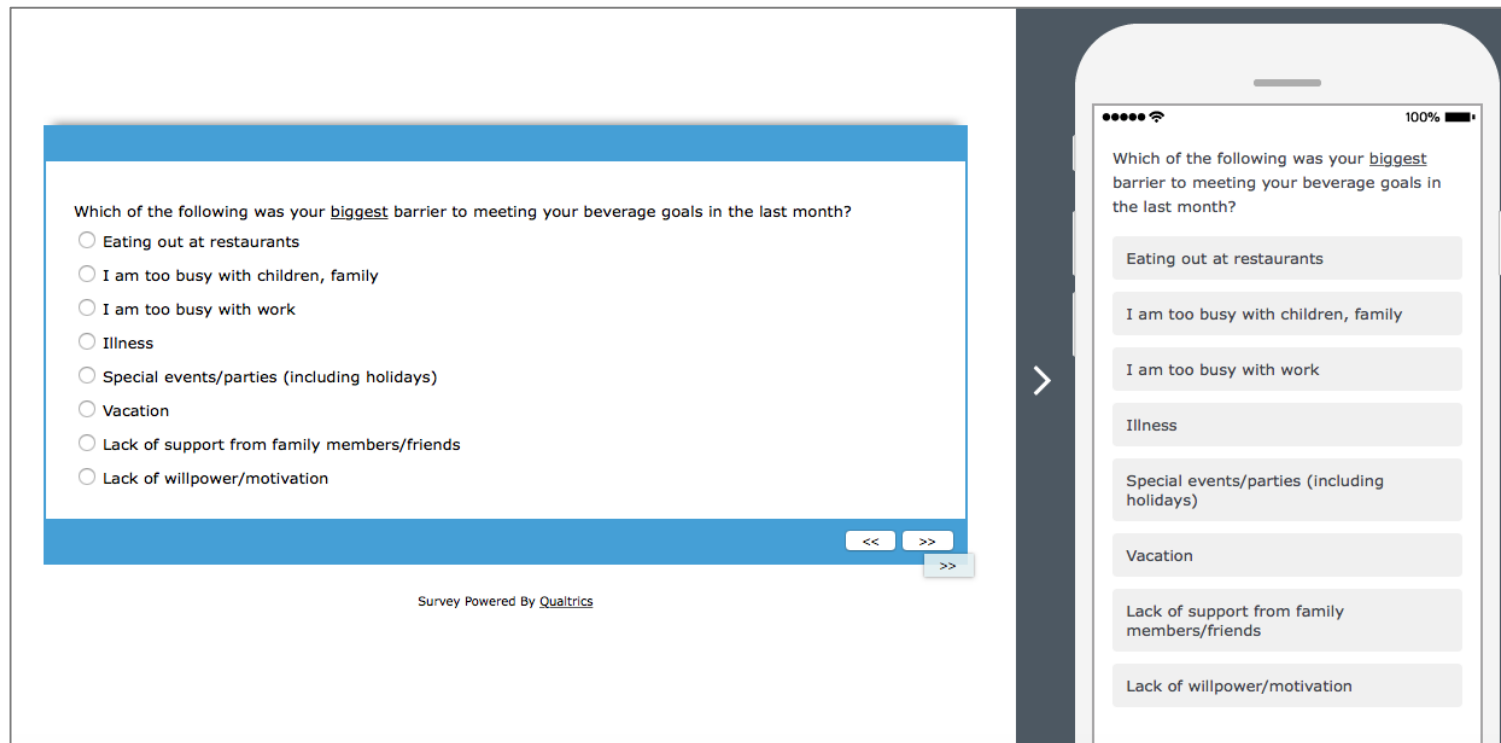
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- Feedback messages created based on weekly and monthly progress toward goals







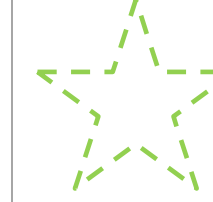
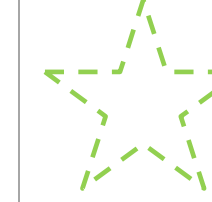
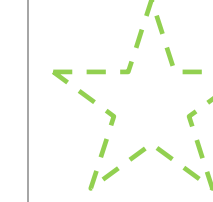
# Monthly Progress and Barrier Checks

- Desktop and mobile Qualtrics
  - Link to Qualtrics questionnaire in feedback email

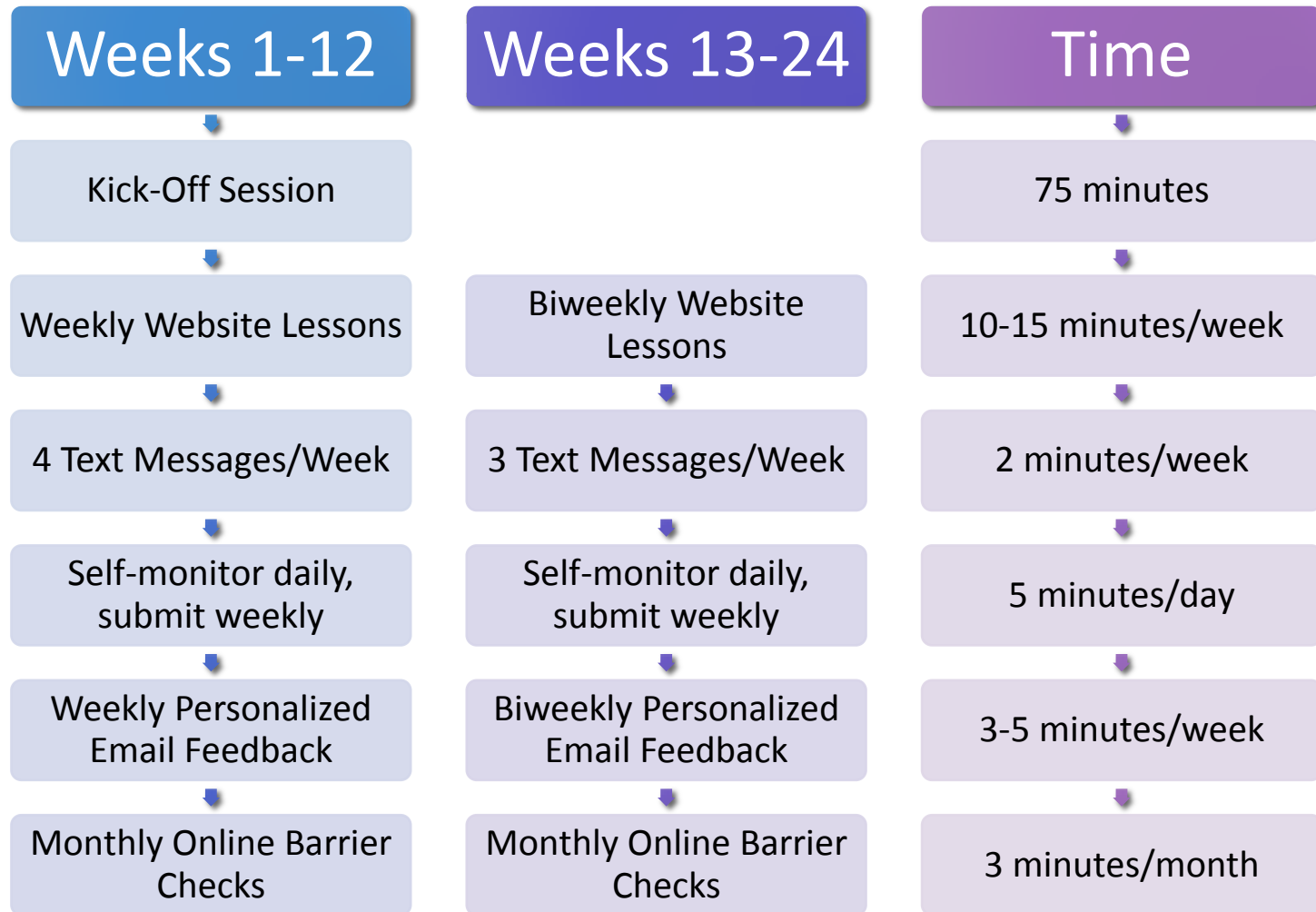


# Child Sticker Charts

- Weeks 1-12
- Study-provided stickers and prizes for meeting weekly goals

William		Goal: 2/day (14/week)			July 21-27	
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
I drank ____ servings or less of juice and sugary beverages today!	I drank ____ servings or less of juice and sugary beverages today!	I drank ____ servings or less of juice and sugary beverages today!	I drank ____ servings or less of juice and sugary beverages today!	I drank ____ servings or less of juice and sugary beverages today!	I drank ____ servings or less of juice and sugary beverages today!	I drank ____ servings or less of juice and sugary beverages today!
						

# Program Delivery



# In-Person Assessments

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- Baseline, 3 months, 6 months
- Height and weight (mother and child)
- Sugar-sweetened beverage/dietary intake
  - One 24-hour dietary recall (mother and child)
  - **Child fluid ounces of SSB/juice per day**

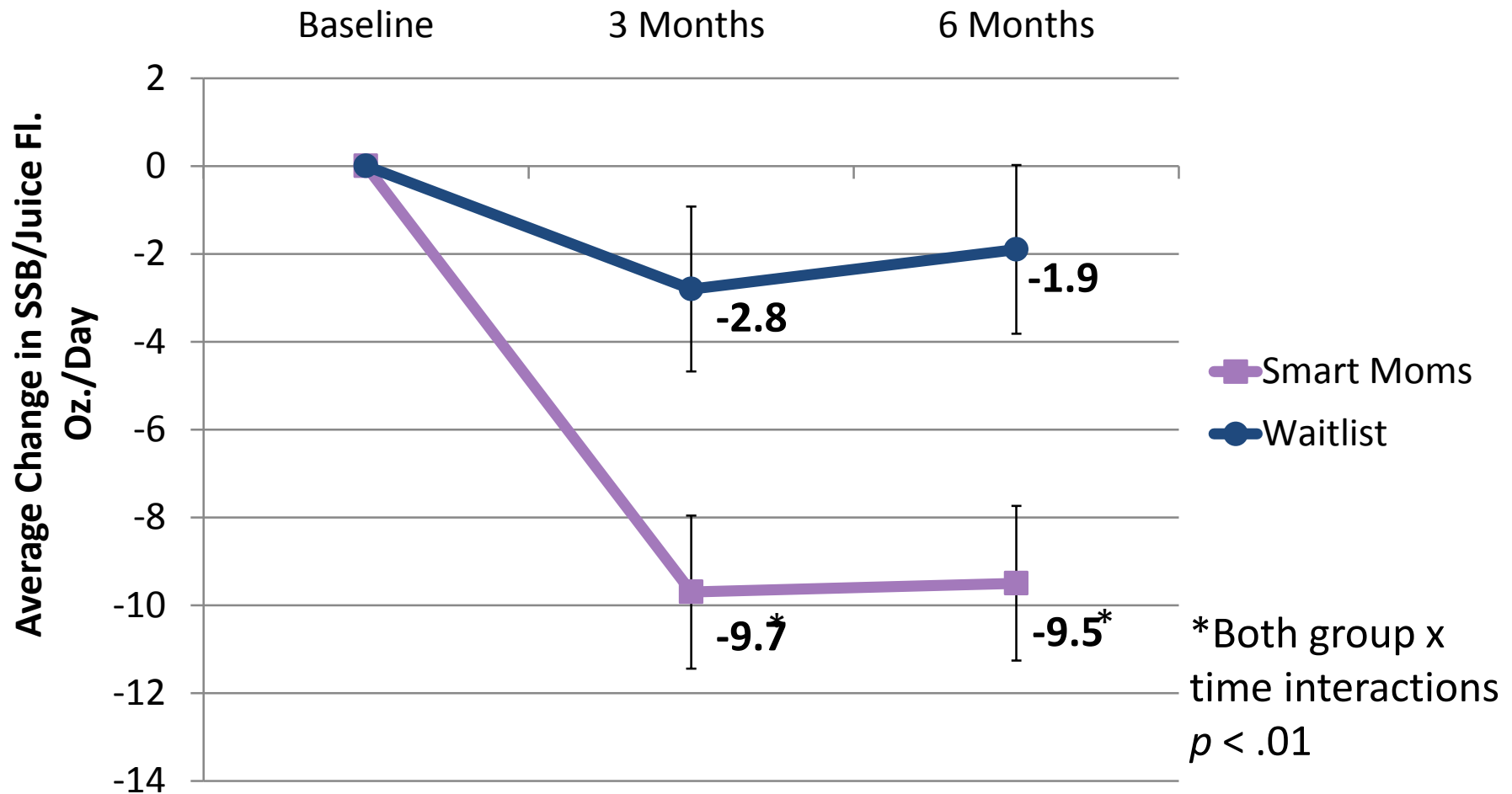


# Baseline Characteristics

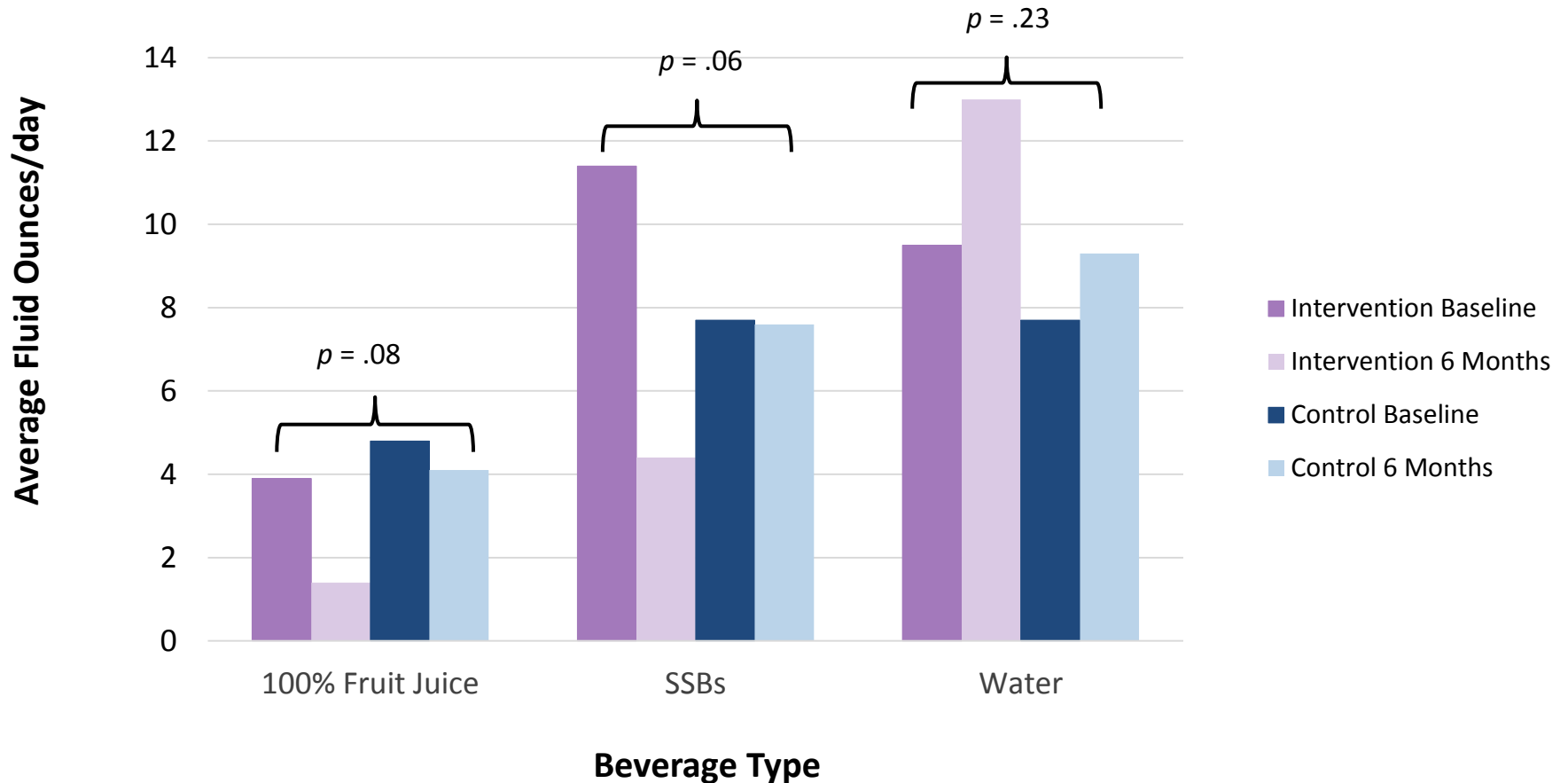
	Smart Moms (n = 27)	Control (n = 24)	<i>p</i> value
<b>Mothers</b>			
Age (years)	36.6 (5.7)	36.2 (4.3)	.78
BMI (kg/m <sup>2</sup> )	33.1 (4.8)	32.0 (5.9)	.47
White (%)	81.5%	66.7%	.45
Income ≥ \$50,000/y	85.2%	78.3%	.53
Education (college or more)	81.5%	79.2%	.84
Married	92.3%	87.5%	.54
<b>Children</b>			
Age (months)	56.4 (10.5)	51.3 (9.2)	.07
Male %	40.7%	56.0%	.21
BMI z-score	0.30 (1.02)	0.49 (0.90)	.49
Child SSB/juice (fl. oz./d)	15.28 (9.72)	12.45 (7.95)	.26



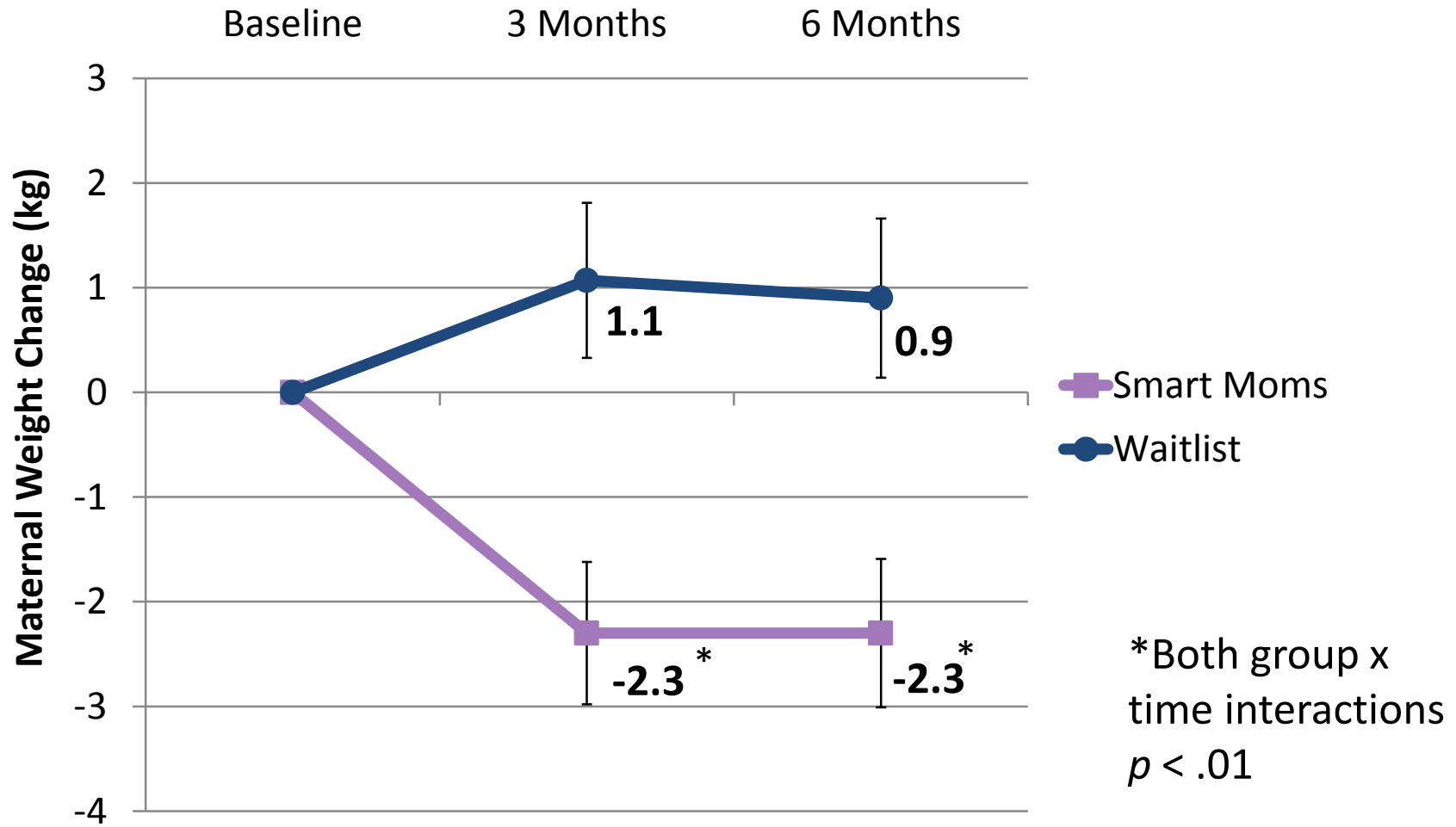
# Child SSB/Juice Reduction in Smart Moms



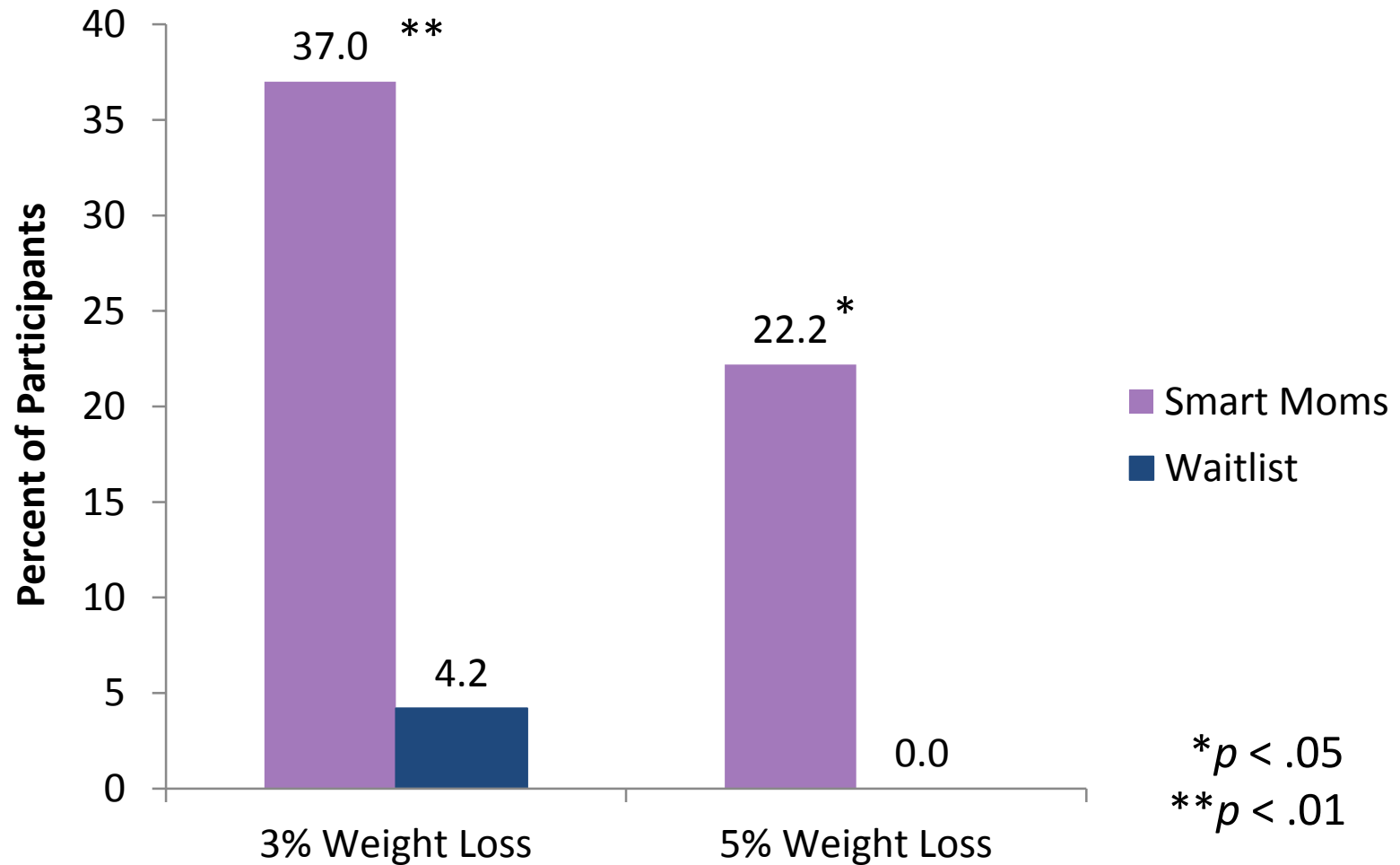
# Beverages by Time and Group



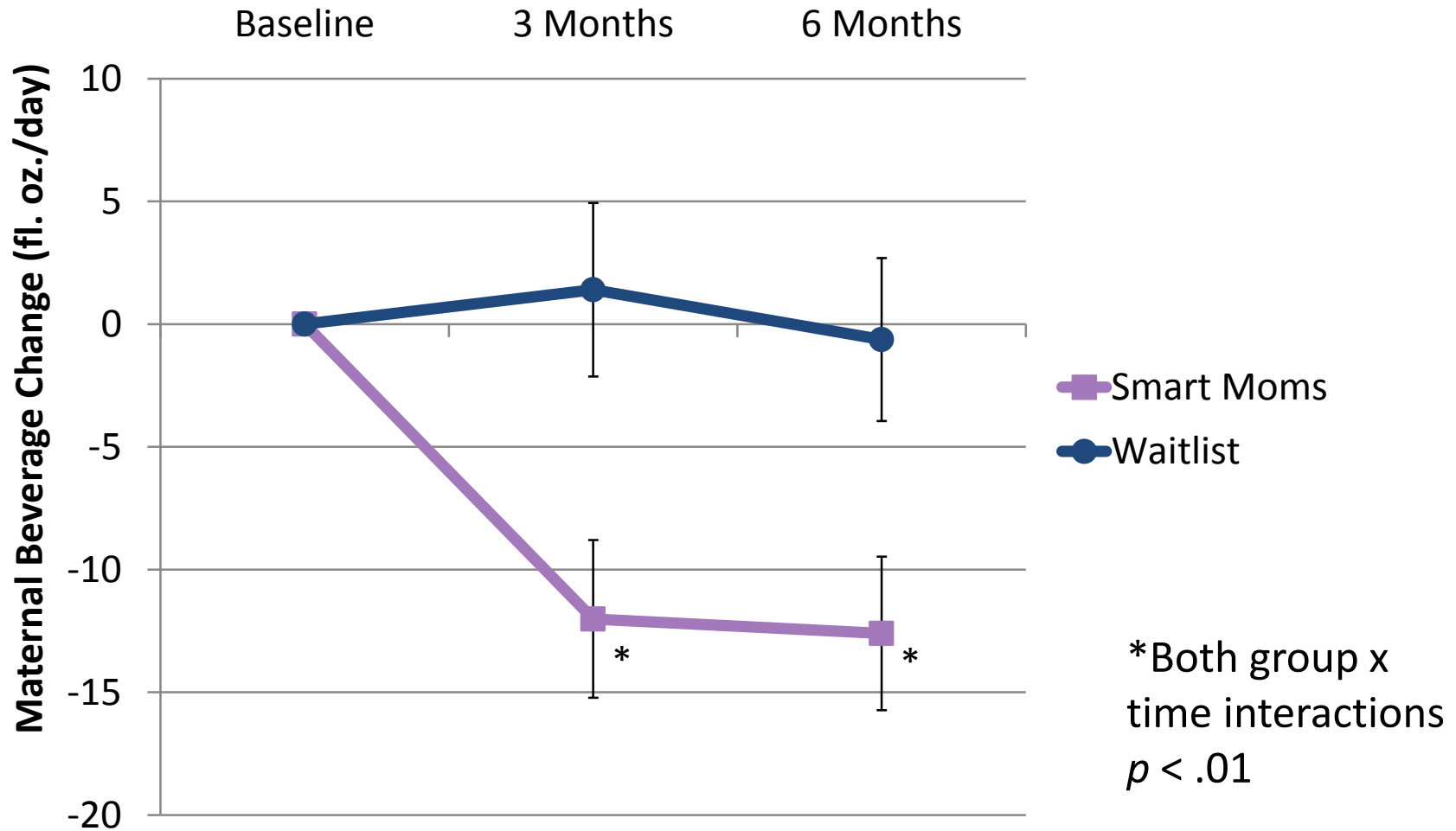
# Maternal Weight Loss in Smart Moms



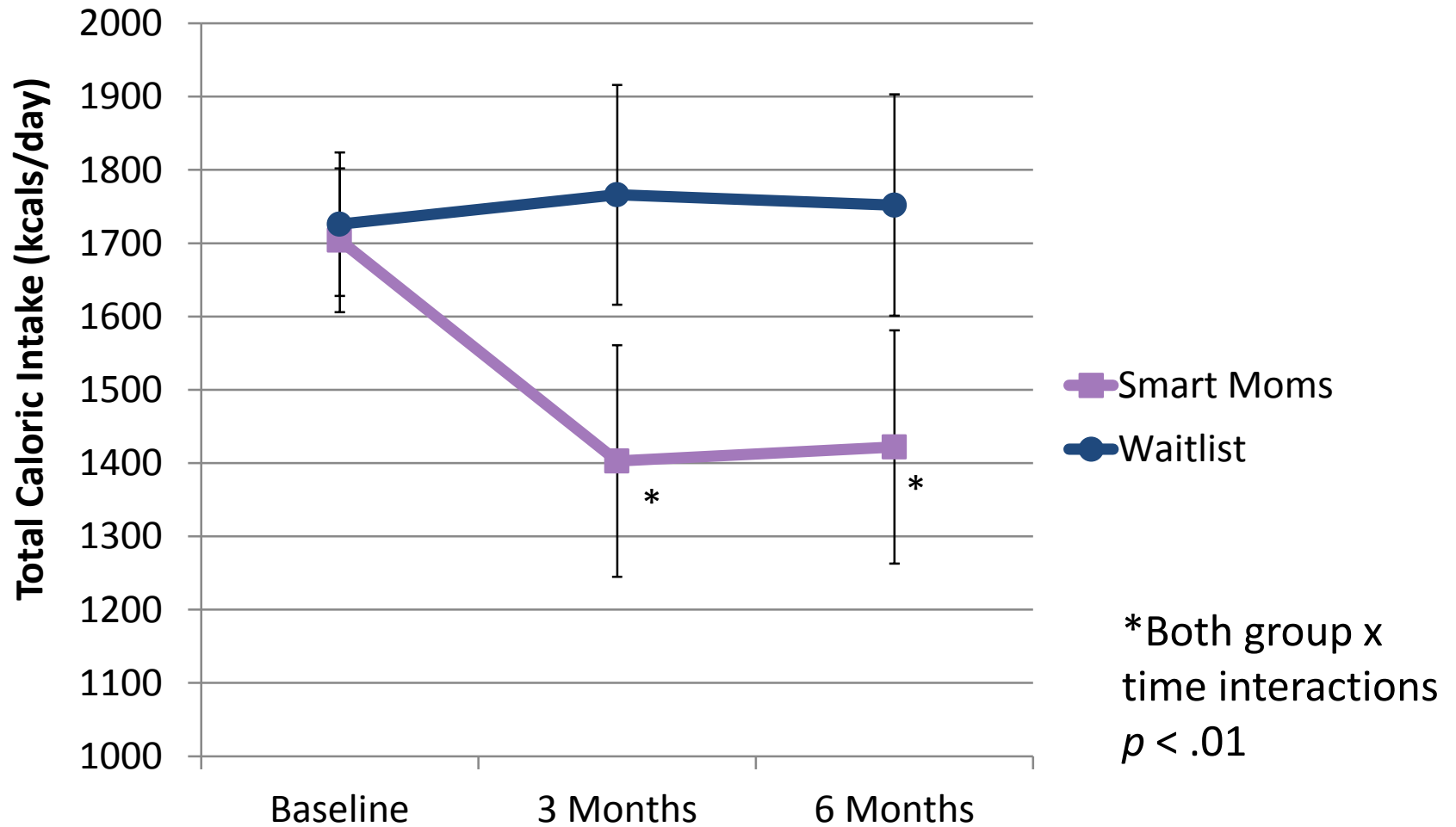
# Mothers with 3% and 5% Weight Loss



# Maternal Caloric Beverages



# Maternal Dietary Intake



# Program Participation

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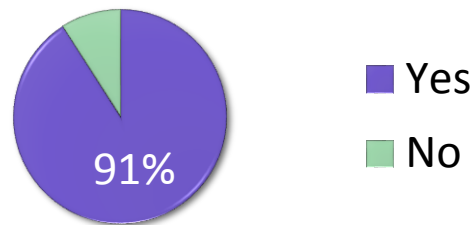
- Text Messages
  - Average of **21.5 ( $\pm 4.3$ ) of 24** self-monitoring texts completed
  - Average of **15.4 ( $\pm 1.7$ ) of 18** goal progress assessment texts completed
- Website
  - Average of **11.7 ( $\pm 4.9$ ) of 18** lessons read (self-reported)



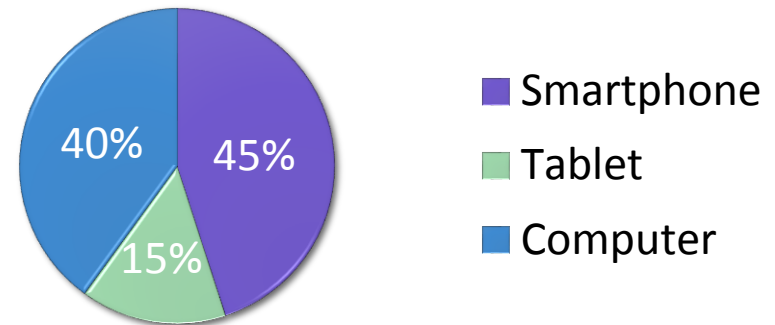
# Intervention Feedback

- Average time per week: 50 minutes

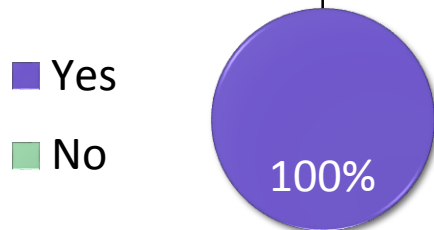
**Satisfied with Program**



**Lessons**



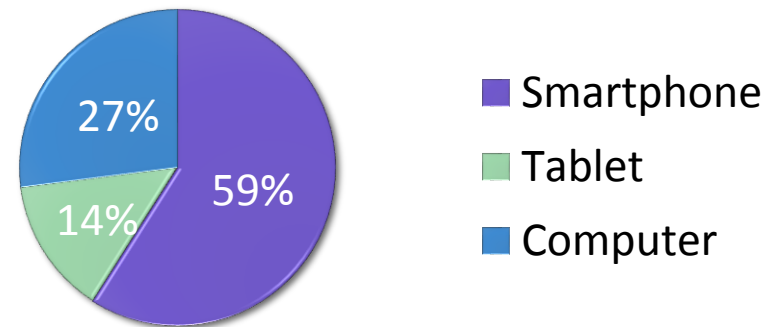
**Recommend Program to Friend**



**Confident in Child SSB Changes**



**Feedback Emails**



# Public Health Impact

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Highest  
reduction in SSBs



↓ 145 calories a  
day



↓ 27g added  
sugar

# Conclusions

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- Evidence that a novel mobile-delivered program can change dietary behaviors of mothers and children
- High program participation and satisfaction
- Potential in targeting maternal behaviors to promote child behavior change
- Mothers are interested in low-burden programs
  - Study similar methods to reach families and underserved populations

# Strengths and Limitations

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- Strengths

- Innovative RCT
- Low burden
- Low cost
- Grounded in theory
- Adequately powered
- Potential for dissemination

- Limitations

- Beverage data: one day only
- Limited validated measures
- Homogenous sample population limits generalizability

# Acknowledgements

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- Committee Members

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- Susan Ennett, PhD
- Leslie Lytle, PhD
- Dianne Ward, EdD

- Funding Sources

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- Dissertation Completion Fellowship
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