

# Peer-Led Text Message Intervention improves fruit, vegetable, and goal setting among rural adolescents

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# Background

Rural and minority adolescents have higher rates of obesity and consume fewer fruits and vegetables relative to their urban counterparts[1, 2]. Additionally, rural and minority adolescents are at greater risk for cardiovascular disease and associated co-morbidities relative to their urban minority counterparts[3]. A host of factors related to geographic isolation, socio-economic status, and lack of access to affordable healthy foods all contribute to the growing prevalence of obesity and poor dietary outcomes[1, 4].

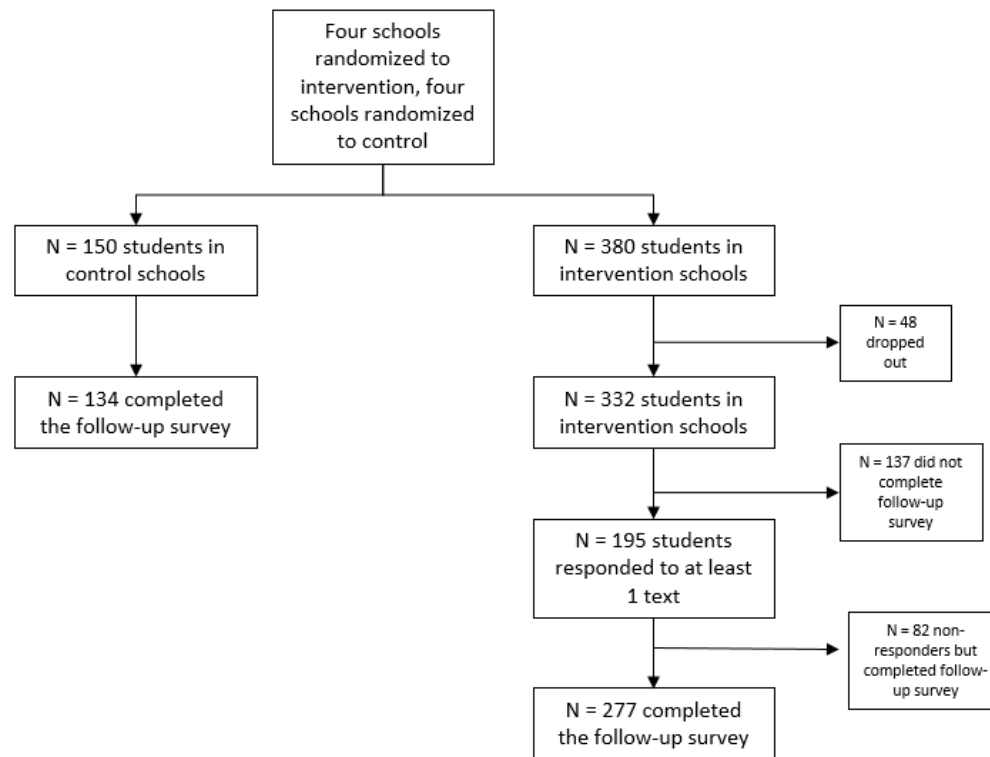
# Why Text messaging?

In recent years, there has been increasing proliferation of interventions utilizing text-messaging and web based applications (“apps”) as tools to encourage and promote healthy behaviors. Such technology-based interventions have been successful for tobacco cessation, reducing alcohol abuse[12-14], and weight loss among adolescents[15]. Specifically related to dietary intake, several weight loss interventions have utilized mobile applications to deliver targeted messages about weight loss behaviors and text messages containing tailored dietary feedback[16]. Overall, these strategies are effective at producing weight loss among adults and adolescents[17]. Yet, there are no interventions aimed at providing affective messages targeting intake of fruit, vegetable, and low-calorie beverages, specifically among rural dwelling and minority adolescents[18, 19]. Moreover, there are limited interventions explicitly utilizing theory-based design in the text message content[19, 20].

# Research AIMS

- ▶ The overall aims of this paper are to report the intervention effect on:
  - ▶ 1) fruit, vegetable, and sugar-sweetened beverage intake compared to controls;
  - ▶ 2) food shopping habits;
  - ▶ 3) home availability of fruits, vegetables, healthy and less healthy snacks, and sugar-sweetened beverages; and
  - ▶ 4) key theoretical constructs that were imbedded within the messages (self-efficacy and goal setting).

# Intervention Details - Methods Conducted in Kentucky and North Carolina

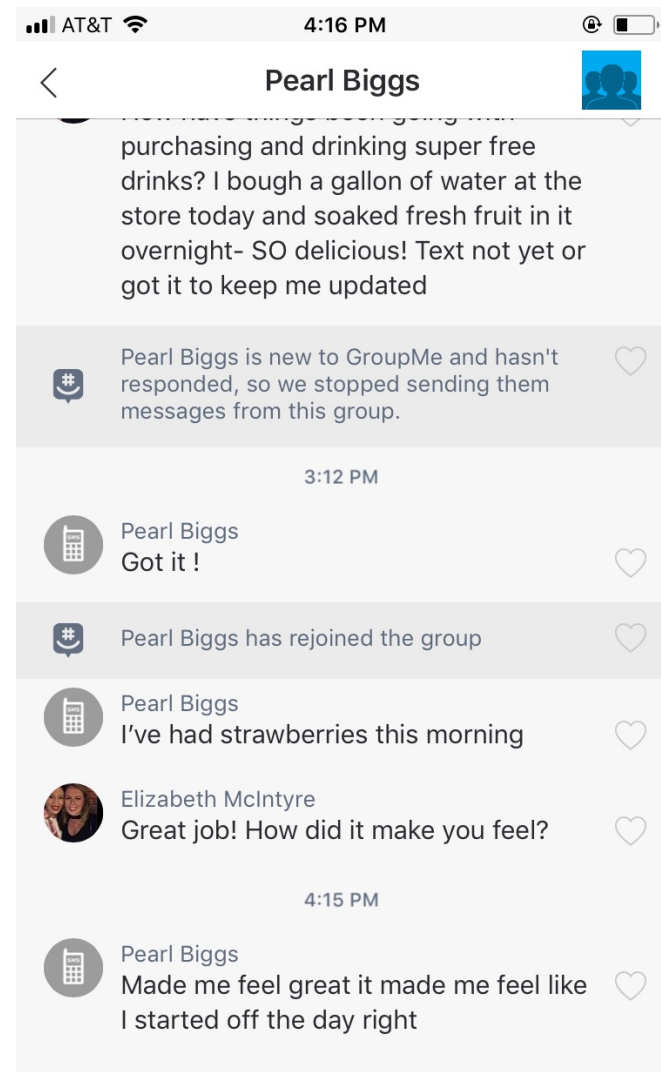


# Intervention Components

- ▶ Undergraduate students in DHN were trained and sent affective messages over the course of 8-weeks
  - ▶ “How do you feel when you can choose to eat fruit?”
- ▶ Messages were sent two times per week focused on improving fruit, vegetable, and low-calorie beverage intake
- ▶ Feedback was then tailored to what the adolescent responded with after the initial message

## An Example of the undergrad: adolescent exchange

Group Me is a free app that was used. This can be used with large groups but for confidentiality there was just a 1:1 exchange



😊 Send Message...



# Results

Demographics Baseline Characteristics of Intervention and Control participants (n=411)			
	Intervention (n=277)	Control (n=134)	
<b>Age (mean)</b>	15 (.07)	15 (.10)	
<b>Gender</b>			
Female	61%	67%	
Male	38%	30%	
Other (Male to Female; Female to Male; Other)			
<b>Race</b>			
White	72%	55%	p=.01
Other (African American/hispanic)	28%	45%	p=.01
<b>Dietary Intake and Body Mass Index</b>			
Fruit and Vegetable Servings (mean and SE)	3.83 (.24)	5.56 (.54)	p=.01
Sugar-sweetened beverage calories (mean and SE)	439 (31)	470 (54)	
Sugar-sweetened beverage grams (mean and SE)	1112 (79)	1200 (140)	
BMI z-score percentile (mean and SE)	.76 (.02)	.72 (.02)	
<b>Food Shopping Practices</b>			
Buy fruit and vegetables (mean times per week purchased)	16 (.99)	13 (.92)	
Buy Fast-food (mean times per week)	31 (.99)	27 (1.26)	
Buy Healthy Snack foods (mean times per week)	8.74 (.54)	6.39 (.59)	
Buy Less Healthy Snack	15.88 (.84)	13.58 (1.05)	
Buy SSB	10.33 (.48)	9.95 (.68)	
Buy water or no calorie beverages	5.38 (.30)	5.22 (.40)	



# Results – AIM 1 (Primary Outcome – F/V)

Dietary Intake and BMI	Change within intervention participants	Change within control participants	Difference between inte
Fruit and Vegetable servings	.71 (-.02, 1.45)	<b>-1.52 (-2.48, -.56)*</b>	<b>1.28 (1.11, 1.48)*</b>
SSB Calories	<b>-61 (-125, 80)*</b>	-39 (-149, 71)	-39 (-164, 85)
Total Beverage Calories	-26 (-139, 87)	-118 (-320, 83)	14.99 (-186, 216)

# Results – AIM 2

<i>Food Shopping practices</i>			
Fruit and Vegetables purchases over 7 days	<b>2.55 (.69, 4.42)*</b>	1.39 (-.65, 3.44)	1.07 (.94, 1.22)
Less healthy snack purchases over 7 days	.82 (-.88, 2.53)	-.18 (-2.13, 1.75)	1.06 (.85, 1.33)
Healthy snack purchases over 7 days	<b>1.81 (.68, 2.94)*</b>	<b>1.87 (.54, 3.20)*</b>	1.02 (.84, 1.23)
SSB beverage purchases over 7 days	.26 (-.71, 1.24)	-.25 (-1.64, 1.14)	1.02 (.85, 1.21)
Water or no calorie beverage purchases	<b>.87 (.18, 1.56)*</b>	.36 (-.58, 1.31)	1.03 (.88, 1.21)

# Results – AIM 3

Home Availability (Percent Change Reported)			
<u>Fruit and Vegetables</u>	p=.3	p=.02	p=.03
Never	<1%		7%
Sometimes		4%	6%
Always		5%	-13%
<u>Vegetables served at dinner</u>	p=.08	p=.2	p=.03
Never	-2%	-12%	
Sometimes		7%	11%
Always	-5%	-3%	
<u>Junk Food</u>	p=.008	p=.68	p=.01
Never		8%	1%
Sometimes	-4%		3%
Always	-5%	-4%	

# Results- AIM 4

<b>Table 3. Intervention Effect on Constructs inbedd</b>	
	<b>Odds Ratio 95% CI</b>
<b><u>Self-Efficacy</u></b>	
Fruit	.93 [.73, 1.29]
Vegetable	<b>1.59 [1.19, 2.13]*</b>
Healthy Snacks	.72 [.48, 1.09]
<b><u>Goal Setting</u></b>	
Fruit	<b>1.52 [1.18, 1.95]*</b>
Vegetabke	<b>1.75 [1.19, 2.58]*</b>
Sugar-Free Beverage	<b>1.94 [1.18, 3.27]*</b>

# Conclusion

- ▶ A mentor-led text message intervention with affective messaging improves fruit and vegetable intake
- ▶ These programs can be disseminated across health insurance companies, other universities, and health departments as a way to improve dietary intake
- ▶ Future directions - an R01 application is under review to test this approach with a 8\*2 = 16 week program on long-term outcomes and cost-effectiveness for broader dissemination

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