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Evaluation of Parental Involvement in the Families in Transformation (FIT) Weight Management Program for Children

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ABSTRACT

The purpose of this study was to evaluate parent involvement in the Families in Transformation (FIT), for children and their parents/caregivers. Eighteen children and their families participated in the 8-weeknutrition education and physical activity program conducted by Health Works! health education and fitness center. Mean age of the children was 10.52 ± 1.26 years, with 9 males and 9 females. Fifty-six percent of the children were white, 25% were black, and 19% identified as multiracial. Nutrition and fitness knowledge, health habit survey, and food frequency data was collected for children and parents/caregivers. A satisfaction survey for parents was administered the past night of the program. Chi square analysis revealed modest improvements in several of the parents' health habits, and both parents and children improved scores on the pre- and post- nutrition and fitness knowledge quiz. Correlation coefficients on the mean food frequency responses versus weeks in the program revealed modest improvements in the children' eating habits, but not for parents. Results for the parent satisfaction survey were almost universally positive. Family wellness interventions offering nutrition education and physical activity for the whole family may lead to more positive outcomes than programs focused solely on children.

Keywords: *education, parental involvement, health education, fitness.*

INTRODUCTION

An increasingly sedentary lifestyle and the ready availability of energy dense foods have proved to be a causative combination for childhood obesity in the United States and globally (Adamo& Brett, 2014). While obesity rates have decreased in children aged 2 to 5 years from 13.9% in 2003-2004 to 9.4% in 2013-2014, they have remained stable for children aged 6 to 11 years at around 17% since 2007-2008, and increased for adolescents aged 12 to 19 years from 10.5% in 1993-1994 to 20.6% in 2013-2014 (Ogden et al., 2016; US HHS, 2012).African-American and Hispanic children are at a higher risk for childhood obesity and the associated co-morbidities such as Type 2 diabetes (Patino-Fernandez, Hernandez, Villa & Delamater, 2013).

Convenience and fast foods, and other foods high in fat, sodium, and sugar have all contributed to diets that may be high in calories, but low in beneficial nutrients (Adamo & Brett, 2014; Gray et al., 2007). In an effort to pinpoint and remediate the cause of obesity, some researchers have targeted the eating habits of children and their families (Gray et al., 2007). Parents have a significant effect on their children's eating behavior and encouraging a healthy lifestyle and good eating habits at an early age is crucial to combatting the obesity epidemic (Patino-Fernandez et al., 2013). Some pediatric wellness programs include education on healthy eating and physical activity for parents as well as their children Much of the current research emphasizes the importance of having the whole family involved in the pursuit of a healthy lifestyle, and support from family can help children maintain lifestyle changes over the long term (Rawlins, Baker, Maynard & Harding, 2012). Yabanci, Kisac and Kerakus (2014), contended that mothers have the most

influence over their children's nutritional decisions. After administering a 30-item inventory assessment to 302 mothers of children in Ankara, Turkey to determine the nutritional knowledge of the mothers; the authors found that the children of mothers who had a higher nutritional knowledge most often had a normal body mass index (BMI), and consumed more fruits and vegetables and less fast foods and sugary drinks than children of mothers who had less nutritional knowledge (Yabanci et al., 2014). Using nutrition knowledge assessment surveys, Campbell et al. (2013), found that a mother's nutritional knowledge was significantly associated with their children's consumption of fruits and vegetables (Campbell et al., 2013).

In a study of how parents perceive their children's weights, Mareno (2013) suggested that parents may be more accepting of their children being overweight because they themselves may be overweight. Mareno (2013) stated that the way to combat this view is to promote lifestyle changes and healthy eating habits within the family unit, primarily through the creation of nutrition and lifestyle intervention programs.

Nutrition and physical activity programs designed for families have become popular in recent years, and evaluation of these programs is vital to identification of the most effective components. Watson-Jarvis, Johnson, and Clarke (2011) evaluated the *Make It HAPPEN* family education program and determined that the child participants in the 12-week program had an overall weight reduction, a positive view of the program, and a feeling of an overall improvement in quality of life. Through post-program measure such as questionnaires, the children at or above the 98th percentile for BMI cited a positive improvement in their self-esteem as well as a reduction in their BMI score (Watson-Jarvis et al., 2011). The researchers also received positive feedback from the families about the program's use of "family fun nights," which allowed families t to support each other, participate in physical activities, and share what they had learned about healthy eating and physical activity (Watson-Jarvis et al., 2011).

Families in Transformation (FIT) (n.d.) is a nutrition education and physical activity program to encourage children and their parents and/or caregivers to practice healthy eating and physical activity habits. The program is administered by *Health Works!*, a health education and activity center developed in partnership between Memorial Health System of Indiana, the Health Care Foundation of North Mississippi (HCF) and North Mississippi Health Services (NMHS). The purpose of this research is to evaluate the effectiveness of parental involvement with diet quality, nutrition and fitness knowledge, and health habit outcomes for children and parents/caregivers.

METHODOLOGY

In 2016, researchers from the Department of Nutrition and Hospitality Management at the University of Mississippi (UM NHM) evaluated the *FIT* program at the *Health works!* Health education and fitness center in Tupelo, Mississippi. The Institutional Review Boards of both the University of Mississippi (UM) and NMHS approved both the *FIT* program and this evaluation study, and participating parents/guardians' consent and students' assent was obtained. The program had a $25 participation fee, which was returned to the parents/guardians upon completion of the program. There were no incentives from UM NHM for parents/guardians or children to participate in the *FIT* program, though upon completion of the program, each family received a $100 gift card to Kroger from *Health Works!*.

Subjects

The *Health works!* Staff recruited children and their parents from Tupelo area elementary and middle schools and pediatric and family medicine clinics. As seen in Table 1, children of both genders (50% females and 50% males), aged 8-11 (mean: 10.52 ± 1.26) years participated in nutrition education physical activity. There was some ethnic diversity within the child population

with 56% white, 25% black, and 19% multiracial participants. The parent group was not as diverse as 92% of the participants were female and 62%were white. All of the parents (85%) had at least one university degree; 15% also had a graduate or professional degree.

Not all participants were overweight or at risk for obesity. Three males were referred for poor nutrition and/or physical activity status. Most of the children were, however, overweight as identified by BMI z-scores (n=6 females and 2 males), and some were referred to the program

because of obesity risk (overweight) with high blood pressure (n=3 females and 4 males).

Table1. *Baseline demographic characteristics of FIT participants.*

Variable	Students (n = 18)	Parents (n=13)
Mean age (years)	10.52 (1.26)	42.5 (3.92)
Gender		
Males (n=9)	50%	8%
Females (n=9)	50%	92%
Ethnicity		
White	56%	62%
Black	25%	23%
Hispanic	0%	0%
Asian	0%	8%
Multiracial	19%	0%
Other	0%	8%
Residence		
Apartment	13%	8%
House	75%	77%
Mobile home	13%	15%
Education level(parents only)		
8th grade		0%
High School/GED		0%
College/University		85%
Graduate/Professional		15%

Standard deviations are reported in parentheses.

Procedure

The *FIT* program lasted for 8 weeks. Baseline assessment data was collected in the first week, and participants were introduced to the program. Heights, weights, blood, pressure, and resting heart rate was recorded and reported elsewhere (Knight, Devers, Maloney, Bomba, & Walker; *in press*)An 11-question health habit survey(Benzies, Clarke, Barker, &Mychasiuk; 2013) and a 10-question nutrition quiz was administered to each student and parent/guardian on the first night and the last night of the program. The children completed the surveys and quizzes independently. A brief food frequency questionnaire (FFQ) (Kobayashi et al. (2015) was administered on Monday evenings in weeks 2, 4, 5, 6, and 7. Both parents and children were asked to estimate numbers of servings of various food groups based on their eating habits for the prior 24 hours. A program satisfaction survey was administered to parents/guardians the final night of the program. Surveys, quizzes, and FFQs were administered in English, and none of the participants were excluded from the study.

Parents/guardians joined the students for the 45 minute nutrition education lessons administered on Monday evenings, then the students went to a 1-hour physical activity while parents stayed for extra nutrition education and/or a question and answer session. The nutrition education lessons were taught by a registered dietitian from the North Mississippi Medical Center (NMMC) in Tupelo, MS; and this was the only mandatory meeting of the week for parents. The nutrition education includedlessons on *MyPlate*, healthy snacking, reading food labels, portion sizes, grocery shopping, andhydration. On Tuesday and Thursday evenings children participated in 1-hour physical activity sessions, and parent participation was optional.

Data Analysis

Demographic data was analyzed using descriptive statistics. Chi square analysis was used to determine any category changes from pre- to post-*FIT* program for parent and student responses to the health habit survey and the nutrition and fitness quizzes. Pearson's correlation coefficients were calculated for the means of weekly parent and student results for the FFQ versus time in the *FIT* program.

RESULTS

Percent of parent and student responses to the health habit survey can be found in Tables 2 and 3. Parents reported reading food labels more on the post-program survey (77% "most of the time" and 15% "always") compared to the pre-program survey (44% "most of the time" and 6% "always") *($p < 0.001$)*.Pre-program, 44% of parents responded that they ate "a little too much and 44% reported that they ate "the right

amount". Post-program, 15% of parents answered that they ate "too much" and 77% answered that they ate "a little too much" *(p < 0.05)*.Parents started using less technology on the week days (44% of parents reported using technological items "more than 4 hours" a day pre-survey, whereas post survey 38% reported using technological items "more than 4 hours"*(p < 0.001)*.While both parents and students reported more physical activity in a normal day, the parents had the greater increase. Pre-*FIT*, most of the parents reported getting "less that 15 minutes" (33%) or 15 to 30 minutes (28%) of physical activity per day. Post-*FIT*, 15% reported getting less than 15 minutes per day, while those reporting 15 to 30 minutes increased to 31%. The group that reported getting 30 to 60 minutes of physical activity per day rose from 17% pre-*FIT* to 38% post-*FIT* ($p < 0.05$). The largest change for students was for the response "15 to 30 minutes" (41% pre-*FIT* to 44% post-*FIT*, *p <0.05*).While no significant differences between pre-and post-*FIT* were determined for children, parents reported physical activity on more days of the week. While 56% reported performing physical activity on 0-2 days of the week before *FIT*, that number fell to 15% post-*FIT*. The number of parents who reported performing physical activity 5 to 7 days per week increased from 11% to 31% ($p < 0.05$).

Table2. *Parent results from the pre:post-FIT health habit survey.*

Questions	**Percentage of Pre:Post-*FIT* Program Survey Responses**					**Probablility**
1. Do you read food labels?	Always	Most of the time	Sometimes	Rarely	Never	
	6:15%	44:77%	44:8%	0:0%	6:0%	<0.001
2. At meals I eat	Too much	Little too much	The right amount	Not enough	I don't know	
	17:8%	44:46%	39:46%	0:0%	0:0%	<0.001
3. When it comes to snacks I eat	Too much	Little too many	The right amount	Hardly any	No snacks	
	6:15%	56:31%	22:23%	11:31%	0:0%	0.128
4. During 1 weekday, how much do you watch TV?	No TV 11:0%	Less than 1 hr 33:31%	1-2 hrs 33:38%	3-4 hrs 17:31%	more than 4 hrs 6:0%	0.076
5. Hrs spent on electronic devices on 1 weekday?	No Tech 0:0%	Less than 1 hr 17:8%	1-2 hrs 33:38%	3-4 hrs 6:15%	more than 4 hrs 44:38%	<0.001
6. During 1 weekend day, how much time do you watch TV?	No TV 17:8%	Less than 1 hr11:23%	1-2 hrs 39:38%	3-4 hrs 28:31%	more than 4 hrs 6:0%	0.157
7. Hrs spent on electronic devices on 1 weekend day?	NoTech 0:0%	Less than 1 hr 6:15%	1-2 hrs 56:46%	3-4 hrs 11:38%	more than 4hrs 28:0%	0.138
8.How much physical activity do you get per day?	Less than 15 mins33:15 %	15-30 mins 28:31%	30-60 mins17:38 %	more than 60 mins 22:15%		<0.05
9. How many days are you physically active per week?	0-2 days 56:31%	3-4 days 33:38%	5-7 days 11:31%			<0.001

Table3. *Student results from the pre:post-FIT health habit survey.*

Questions	**Percentage of Pre:Post-*FIT* Program Survey Responses**					**Probability**
1.Do you read foodlabels?	Always	Most of the time	Sometimes	Rarely	Never	
	12:13%	12:13%	41:44%	0:0%	12:13%	0.251
2. At meals I eat	Too much	Little too much	The right amount	Not enough	I don't know	
	0:0%	18:19%	71:69%	6:6%	6:6%	0.555
3. When it comes to snacks I eat	Too much	Little too many	The right amount	Hardly any	No snacks	

	0:0%	18:19%	47:44%	12:13%	6:6%	0.398
4. During 1 weekday, how much do you watch TV?	No TV 12:13%	Less than 1 hr 35:38%	1-2 hrs 29:31%	3-4 hrs 24:19%	more than 4 hrs 0:0%	0.399
5. Hrs spent on electronic devices on 1 weekday?	No Tech 6:6%	Less than 1 hr 35:38%	1-2 hrs 35:31%	3-4 hrs 12:13%	more than 4 hrs 12:13%	0.331
6. During 1 weekend day, how much time do you watch TV?	No TV 18:19%	Less than 1 hr 18:19%	1-2 hrs 35:31%	3-4 hrs 18:19%	more than 4 hrs 12:13%	0.095
7. Hrs spent on electronic devices on 1 weekend day?	No Tech 0:0%	Less than 1 hr 24:25%	1-2 hrs 40:38%	3-4 hrs 12:13%	more than 4 hrs 24:24%	0.457
8. How much physical activity do you get per day?	Less than 15 mins 6:6%	15-30 mins 41:44%	30-60 mins 18:19%	more than 60 mins 35:31%		<0.05
9. How many days are you physically active per week?	0-2 days 12:13%	3-4 days24:25%	5-7 days 65:63%			0.209

The results of the pre: post-*FIT* program nutrition knowledge of the parents and students is detailed in Tables 4 and 5. Knowledge of basic nutrition was fairly high, but parents did perform significantly better on five of the ten questions.

Table4. *Parent results from the pre: post-FIT nutrition and fitness quiz.*

Questions	**Percentage of Pre:Post-Program Quiz Responses**					**Probability**
1. How many food groups are shown in MyPlate?	6 0:0%	10 0:0%	5 89:100%	1 0:0%	Idon't know 11:0%	0.043
2. How many cups of fruit should you eat each day?	None 0:0%	1 or 2 11:38%	3 or more 44-62%	I don't know 11:0%		0.035
3. When buying fruit juice, how often is it 100% juice?	Almost always 50:62%	Sometimes 22:0%	almost never 11:23%	I don't know 0:0%	Don't buy juice 11:15%	0.325
4. About how much of your plate should be fruits and vegetables?	one quarter 11:8%	one half 83:85%	three quarters 6:8%	all of it 0:0%		0.481
5. A serving size is	the amount in the package	the amount you eat at one meal	listed on the label	different for everyone		
	0:0%	17:0%	78:10%	6:0%		<0.001
6. A food that is labeled "low fat" always has fewer calories than the regular version	TRUE 28:8%	FALSE 72:92%				<0.001
7. Which of the following is the healthiest snack?	Cookies and milk	canned soda and raisins	peanut butter toast and anorange	cheese, crackers & fruit punch		
	0:0%	0:0%	94:10%	6:0%		<0.001
8. You should warm up every time you exercise	TRUE	FALSE				
	100:100%	0:0%				
9. You can get more fit by…	shopping	raking leaves	doing laundry	cooking		
	6:0%	94:92%	0:8%	0:0%		0.269

10. What is a balanced exercise plan?	running, weights, stretch	running, weights, tennis	running, cycling, tennis	weights, hiking, leg lifts		
	89:85%	0:8%	6:0%	6:8%		0.341

Table5. *Student results from the pre:post-FIT nutrition and fitness quiz.*

Questions	**Percentage of Pre:Post-Program Quiz Responses**					**Probability**
1. How many food groups are shown in MyPlate?	6 0:0%	10 0:0%	5 55:94%	1 5:0%	I don't know 30:6%	0.738
2. How many cups of fruit should you eat each day?	None 0:0%	1 or 2 50:47%	3 or more 45-41%	I don't Know5:12%		<0.001
3. When buying fruit juice, how often is it 100% juice?	Almost always 40:29%	Sometimes 30:12%	almost never 0:12%	I don't Know 15:12%	Don't buy juice 15:12%	0.109
4. About how much of your plate should be fruits and vegetables?	one quarter 25:0%	one half 70:88%	three quarters 0:6%	all of it 5:6%		<0.001
5. A serving size is	the amount in the package	the amount you eat at one meal	listed on the label	different for everyone		
	15:0%	30:29%	45:59%	10:12%		0.157
6. A food that is labeled "low fat" always has fewer calories than the regular version	TRUE 50:29%	FALSE 50:71%				0.044
7. Which of the following is the healthiest snack?	Cookies and milk	canned soda and raisins	peanut butter toast and an orange	cheese, crackers & fruit punch		
	5:0%	0:0%	75:82%	20:18%		0.288
8. You should warm up every time you exercise	TRUE	FALSE				
	95:100%	5:0%				0.044
9. You can get more fit by…	shopping	raking leaves	doing laundry	cooking		
	15:29%	80:71%	0:0%	0:0%		0.297
10. What is a balanced exercise plan?	running, weights, stretch	running, weights, tennis	running, cycling, tennis	weights, hiking, leg lifts		
	50:65%	5:0%	10:18%	35:18%		<0.001

Pearson's correlation coefficients for the mean parent and student data for the FFQversus program week are seen in Tables 6a and 6b, respectively. Although not significant, for parents relatively strong,albeit negative, correlation coefficients were seen for fruits, vegetables, and protein foods (-0.871889929,-0.975698086, and -0.95826748, respectively) suggesting that parents reported eating less of these foods as the program went on. Significantly strong, positivecorrelation coefficients were seen for the students for fruit (0.898322608) and water (correlation coefficient: 0.937756778).

Table6a. *Parent food frequency data correlated by program week.*

Week of Project FIT

Food Group	**1**	**2**	**3***	**4**	**5**	**6**	**Correlation Coefficients**	**P-Value**
Fruits	2.1	2.0	-	1.9	1.2	1.4	-0.871889929	0.054
Vegetables	2.9	2.8	-	2.6	2.2	1.9	-0.975698086	0.005
Breads	2.4	1.8	-	1.9	2.3	2.9	0.511763432	0.378
Meat/Eggs	3.0	3.0	-	2.8	2.4	2.3	-0.95826748	0.013

Dairy	1.8	1.9	-	1.7	1.7	1.9	3.39151^{E-16}	0.999
Soda	1.1	0.8	-	1.1	0.7	0.7	-0.703468574	0.185
Sports drinks	0.0	0.0	-	0.0	0.1	0.0	0.353553391	0.559
Water	3.3	4.1	-	3.4	3.1	2.7	-0.71768305	0.172
Wh wheat bread	0.8	1.8	-	0.9	1.3	0.9	-0.084239093	0.893
Chips	1.1	0.3	-	0.9	0.9	1.0	0.175297772	0.778
Sweets	0.9	0.9	-	1.2	0.8	1.3	0.520133511	0.369

Table6b. *Student food frequency data correlated by program week.*

Week of Project FIT

Food Group	1	2	3*	4	5	6	Correlation Coefficients	P-Value
Fruits	2.09	2.67	NA	2.46	2.79	3.09	0.898322608	0.038
Vegetables	1.45	2.58	NA	2.00	2.00	2.00	0.201028146	0.746
Breads	2.36	2.42	NA	2.62	2.21	2.00	-0.638404059	0.246
Meat/Eggs	2.00	2.67	NA	2.00	2.36	2.36	0.233811809	0.705
Dairy	2.18	2.67	NA	2.69	2.64	2.64	0.651715729	0.233
Soda	0.36	0.75	NA	0.62	0.36	0.36	-0.340768416	0.575
Sports drinks	0.09	0.17	NA	0.23	0.36	0.18	0.597420777	0.287
Water	2.45	2.75	NA	2.69	2.86	3.09	0.937756778	0.018
Wh wheatbread	1.55	2.17	NA	1.62	1.86	1.91	0.265953002	0.665
Chips	1.55	0.75	NA	1.23	1.21	1.18	-0.146531076	0.814
Sweets	0.91	0.58	NA	1.00	0.86	1.00	0.420024994	0.481

The parents expressed very strong satisfaction with the program with 100 percent "extremely satisfied" responses to questions about the staff. A total of 86.8 % of parents reported being extremely satisfied with all aspects of the program. One hundred percent of parents reported being extremely satisfied with their "level of satisfaction with the program."

DISCUSSION

Parents were enthusiastic about what they learned during the nutrition education lessons, and had many questions about food choices for their families, as well as nutritional content of certain types of foods. The most frequent questions were, "Is honey the same as sugar?" and "Does skim milk have enough protein and calcium?".Parents reacted positively to the handouts they were given about healthy snacks and healthy recipes, supporting other programs that have used this technique who also reported positive results. When parents were given healthy eating handouts and recipes in the *Lunch is in the Bag* program (Sharma et al, 2015), there was an overall increase in their children's consumption of fruits. Project *FIT* activities outside of the classroom, such as the grocery store scavenger hunt, were well received by the parents and several said that they learned a lot through the process of actively searching for particular foods and nutritional components. Graziose (2013) also reported positive qualitative responses after an in-store grocery shopping lesson for adolescents and their parents. Integrating more nutrition education outside of a classroom setting where parents can actively participate in learning may be beneficial to delivering nutrition education.

When asked about their lifestyle and behavioral habits in the pre- and post-program survey, parents showed some improvement in several areas. When asked how many hours they spent during a weekend day on cell phones, tablets, and computers, the response rate dropped from 28% to zero. This may be due in part to increase in physical activity, as the percentage of parents getting 30 to 60 minutes of physical activity on average increased from 17% on the pre survey to 38% on the post-survey. There was also moderate improvement in snacking habits of the parents; in the pre-survey 56%reported eating "a little too many" snacks during the day, whereas in the post survey that percentage dropped to 31%.

The high scores on both pre- and post-program nutrition quiz for parents indicated that their nutrition knowledge was fairly high prior to the beginning of the program and improved. This indicates that nutrition knowledge of the parents may not be the main factor influencing unhealthy meal decisions. The positive response the parents gave to the recipes handed out during one nutrition education lesson could make the case for more menu ideas and recipes

to be given to families to give them confidence in the ability to prepare healthful meals.

Based on FFQ data, the students showed modest improvement overall with their eating habits, most notably with their increased consumption of water and fruit. In contrast, parents had a decrease in consumption of fruits, vegetables and water, and an overall increase in consumption of sweets. One explanation for this result may be that through the nutrition education the families received, parents gained knowledge concerning what constitutes a serving size and made adjustments accordingly in their self-reported data. Additionally, parents may need to receive their nutrition education in a different manner than the children in order for them to adopt new eating habits. Whereas children may appreciate the colorful food models and fun games that the nutrition educators use to teach healthy eating, the parents may need an approach more tailored to their individual needs. It may be beneficial for future wellness programs that involve the whole family to consider separating the parents and children for nutrition education. For instance, parents may be receptive to discussions with medical health professionals such as doctors who can inform them of the direct impact of unhealthy eating on their health. Further education on health topics like Type II diabetes mellitus, hypertension, obesity, and other dietary related diseases may make an impression on parents that cause them to make lifestyle adjustments.

Overall parents had a positive response to the program. In the parent satisfaction survey, 86 percent reported being extremely satisfied with all aspects of the program. Though this is encouraging for future participants in the program, further feedback would be beneficial for future programs like *FIT* through satisfaction surveys that include open ended questions and room for additional remarks from the parents. It may be advantageous for child wellness programs such as *FIT* for parents involved with the program to have a way to make suggestions and leave comments for staff.

The literature on evaluations of child wellness programs that actively involve parents is limited. Because the parents and/or caregivers are responsible for food procurement for the home, incorporation of nutrition education for parents with these programs may influence positive changes in regards to food purchasing and meal preparation within the home. Further research with parent involvement in child wellness and nutrition programs would be beneficial to gain a detailed perspective of the advantages to such programs.

CONCLUSIONS

The *Families in Transformation* program increased overall nutrition knowledge in both parents and students, and improved students' eating habits. Though parents valued the program and participating in nutrition education lessons alongside their children, more research is needed to determine the long-term impact of wellness programs on children and their families.

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