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Evaluating the dissemination of Body & Soul, an evidence-based fruit and vegetable intake intervention: challenges for dissemination and implementation research

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Abstract

Objective—To evaluate whether the evidence-based Body & Soul program, when disseminated and implemented without researcher or agency involvement and support, would achieve similar results to earlier efficacy and effectiveness trials.

Design—Prospective group randomized trial.

Setting—Churches with predominantly African American membership.

Participants—A total of 1033 members from the fifteen churches completed baseline surveys. Of these, 562 (54.4%) completed the follow-up survey six months later.

Intervention—Church-based nutrition program for African Americans that included pastoral involvement, educational activities, church environmental changes, and peer counseling.

Main Outcome Measure—Daily fruit and vegetable (FV) intake was assessed at pre- and post-test.

Analysis—Mixed-effects linear models.

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Results—At posttest, there was no statistically significant difference in daily servings of FV between the early intervention group participants compared to control group participants (4.7 vs, 4.4, $P=0.38$). Process evaluation suggested that added resources such as technical assistance could improve program implementation.

Conclusions and Implications—The disseminated program may not produce improvements in FV intake equal to those in the earlier efficacy and effectiveness trials, primarily due to lack of program implementation. Program dissemination may not achieve public health impact unless support systems are strengthened for adequate implementation at the church level.

Keywords

diet; health behavior; health promotion; program evaluation; African Americans

INTRODUCTION

Research supports the health benefits of diets high in fruits and vegetables.¹ In the United States, diet may be a key contributor to racial/ethnic disparities in many chronic diseases.² Fruit and vegetable (FV) consumption may be suboptimal among African Americans,³ and behavioral interventions have been shown to increase FV intake in randomized trials, including those focused on African Americans.⁴ Despite efficacy testing of multiple interventions to increase FV, few have been widely disseminated to achieve public health impact.^{5–6}

The Body & Soul program is a unique example of an intervention tested under research and real-world conditions. After rigorous efficacy and effectiveness evaluations using randomized controlled trials,^{7–10} it was adapted by the National Cancer Institute (NCI) for nationwide dissemination. This article reports on the outcomes of the NCI-disseminated program at the church level, using the RE-AIM framework¹¹ to evaluate components of sustainable adoption and implementation.

Body & Soul Overview

Systematic and evidence-based reviews of intervention studies targeting FV consumption have consistently found that behavioral interventions significantly increased FV intake.^{4,12} These interventions have varied across study settings, intervention approaches taken and populations targeted, with increases in FV intake ranging from 0.1 to 1.4 servings/day¹² or an average of 0.6 servings/day.⁴ While FV interventions have the potential to impact population health outcomes, few have been evaluated for dissemination to the general population.

Body & Soul is one of only a handful of church-based FV programs for African Americans^{7–10,13–15} and to our knowledge the only one to be nationally disseminated. Program details are published elsewhere.¹⁶ Briefly, Body & Soul originated as a collaborative effort among the NCI, the American Cancer Society (ACS), and two university research groups that had conducted independent efficacy studies of similar interventions among African American church members.^{7–10} Both efficacy studies reported an increase of approximately one daily FV serving. These findings led ACS and NCI to spearhead the development of Body & Soul, based on the two successful parent projects adapted for “real-world” implementation. A 16-church effectiveness study of Body & Soul, showed that the intervention group consumed significantly more FV at follow-up than the control group.¹⁶ At this phase, churches implemented the program with training and technical support for ACS staff and with limited research involvement. Process evaluation indicated that the program could be implemented successfully under real-world conditions.¹⁷ The original

study leaders and NCI created a program manual, peer counselor (PC) training DVD and manuals, and other supporting materials and graphics.

The disseminated program has four components or “pillars”: pastoral involvement, educational activities, church environmental changes, and peer counseling. Pastoral involvement refers to committed and involved support from pastors, who can serve as role models of healthy behaviors, deliver health messages in sermons, request changes in how food is served, and encourage the church in their health efforts. Educational activities are designed to teach church members about health, provide opportunities to try new FV, and provide skills to change members’ eating habits. Churches are free to decide activities that work best or are relevant for their church. Environmental changes refer to creating policy about having healthy foods served at church so that healthy eating is a deliberate part of church life. The final pillar, peer counseling is a one-on-one support activity. Church coordinators identify and train individuals to become volunteer peer counselors, who engage in conversations based on motivational interviewing principles with church members. Church coordinators facilitated training using a DVD and supplemental manuals. Members who are interested in healthy eating sign up to talk with a trained volunteer over the phone or in-person. The peer counselors are problem-solving partners focused on listening and helping participants find their own solutions to eating healthier. The program materials provide information and recommendations to support implementation of these four pillars. However, NCI does not provide technical assistance. This provided an ideal opportunity to study a program disseminated outside a research environment and without planned oversight or support from researchers/practitioners, i.e. when churches implement “on their own.”

The primary aim of this study was to evaluate whether an evidence-based program, when disseminated to the target audience and implemented without researcher or agency support, would achieve similar results to earlier efficacy and effectiveness trials. A secondary aim was to assess program implementation through detailed process evaluation.

METHODS

Protection of Human Subjects

Study procedures were reviewed and approved by the Institutional Review Board with expedited review at the University of North Carolina at Chapel Hill. All participants provided written informed consent.

Participants and Recruitment

The NCI promoted Body & Soul through radio and television spots by gospel artist Vicki Winans, from 2004–2005, the Cancer Information Services (CIS) and the NCI website. The CIS delivered free program materials, and with caller permission provided contact information, church location, and congregation size to the research team. Recruitment criteria included: 1) geographic location: diverse urban areas with large populations of African Americans (California, Florida, Louisiana, Michigan, New Jersey, New York, North Carolina, Texas, Virginia, Washington, DC); 2) church size: churches with at least 200 members to allow recruitment of 50 participants; and 3) not already doing Body & Soul or another nutrition program. Of the 319 churches on the CIS lists, 119 met our recruitment criteria. We excluded three churches that were implementing Body & Soul or another nutrition initiative. The remaining ineligible churches were either too small or outside of the targeted geographic locations. We recruited a convenience sample, i.e., the first 16 churches that could be contacted and consented to participate. Each participating church provided a letter of agreement, signed by the pastor, outlining roles and responsibilities of the church and study team. Two churches subsequently dropped out (one cited internal church issues,

one was not an operating church) after completing the baseline survey; therefore, we recruited two additional churches using the same methods. During the intervention, another church dropped out, citing lack of time and inability to deliver the intervention. Thus, fifteen churches were included in the final study, including multiple denominations with a distribution similar to our previous research.^{16,18}

All churches had a predominantly African American membership. We identified a church coordinator from each church, who was responsible for convening a planning team and recruiting a minimum of 50 adult members (18+ years) for survey and program participation. Recruitment activities included announcements at Sunday services and in church bulletins. On completion baseline paper surveys were mailed back to the research team. We then randomized churches to the early (N=8) or delayed/control intervention (N=7). Churches in the early intervention arm, led by the coordinator and planning team, implemented the program over a six-month intervention period. Churches selected who and how many church members to include as part of their planning teams. The same protocol was followed for follow-up survey collection. The delayed intervention churches served as the control group and initiated the program after completing the 6-month follow-up survey. As an incentive, churches received \$300, and church coordinators \$100 at baseline and again after follow-up survey completion. Participants received a 60 minute pre-paid telephone card for survey completion at baseline and follow-up.

Theoretical Framework

We used the RE-AIM framework¹¹ to guide our evaluation. RE-AIM delineates factors critical for evaluating program uptake: reach, efficacy or effectiveness, adoption, implementation quality and quantity, and maintenance. *Reach* is the proportion of the target population that participated: in this case, the number of participants completing follow-up surveys. *Efficacy* or *effectiveness* refers to the intended results of the intervention. We used a prospective, group-randomized (early or delayed) design with pre- and posttest surveys to determine changes in FV intake and psychosocial variables related to FV intake. *Adoption* is the proportion of target settings involved in program initiation. We assessed adoption by examining the church-level decision-making process through church coordinator interviews. Interview questions included: 1) "What prompted your church to adopt Body & Soul?" and 2) "What was the process for deciding to adopt the program?" *Implementation* refers to the quantity and quality of delivery of the intervention components. We evaluated implementation through church coordinator interviews, follow-up participant surveys, and observations of peer counseling training. *Maintenance* refers to continued program implementation and institutionalization within the setting,¹¹ assessed through church coordinator interviews.

Measures

Primary outcome—FV intake was assessed with two validated measures pre- and post-intervention. A 10-item FV questionnaire, adapted from a 35-item measure for US Southern African Americans,¹⁹ measured frequency of FV intake over the last month (French fries/fried potatoes were excluded leaving 9 items for analysis). A two-item measure assessed usual FV intake. We asked, "How many servings of fruits do you eat each day?" and a similar question for vegetables.¹⁹

Secondary outcomes—Intrinsic/extrinsic motivation for FV intake was assessed using an adapted version of the Treatment Self-Regulation Questionnaire.^{20,21} This 16-item measure generates two subscales: 1) autonomous/intrinsic motivation, and 2) controlled/extrinsic motivation. The scale was modified to focus on FV intake. Each item began: "The reason I eat FV is..." An example from the intrinsic scale included, "Because I want to take

responsibility for my own health,” and from the extrinsic scale included, “Because my spouse/ partner wants me to.” Alpha scores for the intrinsic and extrinsic scales for this study were 0.9 and 0.8 respectively.

Self-efficacy for FV intake was assessed with a 10-item validated scale.^{10,16,18} A sample item included: “How confident are you that you could prepare good-tasting recipes that contain FV?” Responses were on a 4-point scale from “not at all confident” to “very confident.” Internal consistency in this study population was 0.9.

Process measures regarding program exposure were only relevant to the early intervention group and included participants’ self-reported exposure to and satisfaction with peer counseling and church-wide activities. These were assessed with closed-ended questions at 6-month follow-up, e.g., “How many Body & Soul events did you attend at your church?” For peer counseling exposure, we asked those who recalled talking with a PC about the number of conversations/calls, topic, quality and fidelity of the conversations/calls to motivational interviewing (MI) principles. Examples included comparative speaking time (*PC spoke more, participant did, or both talked the same*) and how much advice the PC gave (*not enough, just the right amount, too much and can’t say*). Higher scores indicate greater MI fidelity using measures adapted from previous studies.^{8,16}

Church coordinator interviews—Coordinators completed two telephone interviews. The first was approximately eight weeks after the PC training. This interview evaluated program implementation and progress to date. The second interview, 12 months after baseline survey completion, assessed overall program implementation and maintenance. A semi-structured interview guide included questions about coordinator role, program adoption, program barriers and facilitators, activities conducted and long-term maintenance.

Data Analysis

We used descriptive statistics to evaluate RE-AIM components of the program. Quantitative data analyses assessed program effectiveness using SAS software (SAS Version 9.1.3, SAS Institute Inc., Cary, NC, 2002–2003). All comparisons were two-sided with alpha=0.05. We compared baseline characteristics, primary and secondary outcomes between study groups (controlling for randomization by church and respective baseline values of primary and secondary outcomes), and demographics using mixed-effects linear models.²² Controlling for randomization by church adjusts for correlation among observations from the participants nested within each church.²³ We also examined the association of posttest FV intake with self-reported process evaluation measures (e.g., recall of and attendance at program activities).

Trained staff conducted telephone interviews with church coordinators, which were audio-taped and transcribed. Two team members conducted thematic analyses to identify recurring themes. They compared codes, resolved any differences through discussion with project team members, and summarized key findings in relation to adoption, implementation, and maintenance of the program.

RESULTS

Sample Description

A total of 1033 members from the fifteen churches completed baseline surveys; 562 (54.4%) completed the 6-month follow-up survey (Tables 1 and 2). Non-respondents did not differ on socio-demographic variables from study completers. Reasons for non-response were not systematically collected by coordinators; however, commonly cited reasons included: the

coordinator's inability to locate individuals; the voluntary nature of the study; and lack of participation in program activities, which led to disinterest in taking the follow-up survey. Additionally, telephone card incentives were no longer motivating due to cell phone access.

Study participants ($n=562$) were predominantly female (73%) with a mean age of 52 years (Table 1). Approximately 53% were married or living with a partner. A majority (69%) had completed at least some college, and 59% had household incomes of \$30,000 or more annually. At baseline, the early intervention and delayed groups differed significantly with respect to income ($P<.001$), education ($P<.001$), and FV intake on both the 9-item measure ($P<.05=0.01$) and the 2-item measure ($P<.001$). The early intervention group included a greater proportion of individuals who earned more than \$50,000, were more highly educated, and had a higher FV intake at baseline.

Six of the eight early intervention church coordinators completed the first interview and five completed the second. Two coordinators could not be reached, despite multiple attempts, and one had moved out of state. Coordinators ranged in age from 40–60 years; two were retired, and the others had full-time employment. All were African American, and all except one were female. All were active in two or more church ministries, and average church membership was 20 years.

RE-AIM Findings

Reach—We were unable to assess reach in terms of the number of potential churches that could have requested Body & Soul; therefore, we assessed reach at the within-church level. Estimated church attendance obtained from the CIS ranged from 200–3961 attendees per church. We received completed baseline and follow-up surveys from 4.2% of the total estimated attendance among the early intervention churches (completed surveys versus estimated church attendees=273/6461) and 68.3% of the goal of 50 surveys per church (completed surveys versus total surveys requested=273/400).

Effectiveness: Primary outcome—At posttest, participants in the early intervention group reported slightly greater FV intake than those in the control arm, adjusting for baseline (see Table 1 for baseline values). Mean intake was 4.7 and 4.4 daily servings of FV for the intervention and delayed intervention (control) groups respectively, using the 9-item measure, and 5.9 (intervention) and 5.6 (control) for the 2-item measure. Neither of these differences was statistically significant.

Adoption—Coordinators were the impetus for program adoption. Each had heard of the program via radio/television, requested materials, and asked their pastors for permission to start the program. Poor health and eating habits of many in their community were primary reasons for adoption. Plus, coordinators deemed the program as credible because they believed it was designed specifically for African Americans. However, only one of the eight early intervention churches initiated all four pillars. The other seven had initiated at least two pillars.

Implementation—Churches received limited technical assistance from the research team (e.g., help navigating the Body & Soul website). Otherwise, churches were responsible for independently implementing the program. Most churches took an additional 1–2 months post-baseline to recruit PCs and schedule the PC training. This was conducted by the church coordinator using the DVD and accompanying manual. Details about the peer counseling component have been published.²⁴ Regarding other activities, coordinators reported conducting health fairs, health seminars, cooking classes, and healthy food events. Three churches used Sunday breakfast events to promote the program, and one began offering a

“light side/healthy” Sunday breakfast twice monthly for a minimal cost. All coordinators mentioned that they worked to ensure that healthy options were included at all church functions. Other health activities, such as blood pressure screenings and walking groups, were also initiated as ways to address other health issues.

Program exposure/dose—In the early intervention group, 189 participants (79% of 238 survey completers) recalled Body & Soul events at their church (Table 3). Of those, most (94%) reported attending at least one event. Both recall and attendance were significantly associated with increased FV intake on the 2-item measure ($P=.05$). Nearly a third (31%) of participants reported talking with a PC. Recall of at least one PC interaction was significantly associated with increased FV intake on the 2-item measure ($P=.02$) and with higher intrinsic motivation (adjusted for baseline) at follow-up ($P=.02$). Neither the number of peer counseling encounters, nor the quality of the conversations, was associated with FV intake, self-efficacy, or intrinsic motivation related to FV intake. Participants who remembered having talked more than the PC during conversations had higher ratings of self-efficacy for FV intake than those who did not ($P=0.05$).

Implementation facilitators—Coordinators specified several factors that assisted in program implementation. They viewed the program as necessary, highly adaptable, and spiritually and culturally appropriate. One coordinator said, “I was able to use creative ways to share information, get people’s attention, and introduce new foods.” Others used existing church resources, such as a diabetes support group, the pastor, or other health professionals, to introduce new activities. Coordinators appreciated that program materials “referred back to the temple,” i.e., made the health and spirituality connection clear. Program materials were useful because they included “pre-fabricated fliers so that the health ministry had less work to do in getting the publicity and advertisements out.” One coordinator stated that, after receiving the materials, all you had to do was “open the box and get started.”

Implementation barriers—Allocating time for the program was problematic, due to competition for shared space and resources, as well as congregants’ busy schedules. Although there was high demand for health initiatives, there were not enough leaders to implement the program. Several coordinators noted that planning team members were involved in other church ministries, and finding time for Body & Soul was challenging. A majority of the coordinators suggested that additional technical assistance with program implementation would have been useful. They would have liked to “discuss issues” and plan activities with the research team or another church that had successfully used the program. When there was lackluster pastoral support, the program was stymied. One coordinator suggested, “It would have been beneficial to have more emphasis from the pastor in terms of incorporating it [nutrition messages] in the Sunday sermon.” Another said that the new pastor did what was asked of him but “had we had someone who was a little bit more excited, maybe it would help.” Another barrier was insufficient resources to provide FVs for church-wide programs. While monetary incentives were useful in the short term, continued resources were needed to plan and implement activities.

Maintenance—All but one coordinator reported their intention to continue the program. Most said that, as a result of the program, congregants’ overall awareness and attitudes about healthy foods were changing. Almost all noted that healthier foods were commonly served at church events or that “people are not complaining” when healthy foods were served.

DISCUSSION

The primary goal was to determine whether the Body & Soul program, when adopted and implemented entirely by church members, would result in positive behavior change. The results showed that there was no statistically significant difference in daily servings of FV between the early intervention group participants compared to control group participants. In one of the previous efficacy trials, The Black Churches United for Better Health, at follow-up, the intervention group consumed 0.85 (SE = 0.12) servings more than the delayed intervention group ($P < .0001$)⁷⁻⁸. In the second efficacy trial, Eat for Life, FV change was significantly greater in the intervention with the net difference between the intervention and control group being 1.38 FV servings⁹⁻¹⁰. Similarly in the Body & Soul effectiveness¹⁶ trial, intervention participants showed significantly greater FV intake relative to controls. Post-test differences were 0.7 and 1.4 servings for the 2-item and 17-item FV frequency measures. Compared to the previous efficacy⁷⁻¹⁰ and effectiveness trials¹⁶ program effects were substantially attenuated in the dissemination phase.

As in the earlier trials, process measures (Table 3) showed that more exposure/greater implementation led to higher FV intake. Participants who recalled and attended activities (i.e., church-wide events, talking with a PC) increased their FV intake more than those who did not. There was also a significant increase in intrinsic motivation for FV intake among those who recalled talking with a PC. Participants who reported talking more had higher self-efficacy for FV. This type of interaction highlights fidelity to motivational interviewing principles provided during the training and suggests that counselors were listening more to the needs of the church members. Over the intervention period, 61% and 11% of 273 intervention participants reported attending a program event or talking with a PC, respectively. In the earlier effectiveness study, 63% of participants attended a program event and 65% reported talking with a PC.¹⁷

Suboptimal implementation and dilution of the intervention are not uncommon as programs move from efficacy to effectiveness to dissemination.^{25,26} At the dissemination stage, churches are free to implement the program as they choose. The integrity with which intervention components are completed and delivered (fidelity) also has implications for program success. Factors including intervention complexity, resources required, and implementers themselves can impact how a program is implemented. Church coordinators and the planning committee were responsible for program execution. Coordinators reported that the program was needed and materials were easy to use. However, barriers included: time and scheduling conflicts; minimal/lack of pastor support; and additional time and resources required for implementing program components. It was clear that implementation entailed much more planning and organization than anticipated. At one year follow-up, coordinators reported sporadic events pertaining to healthy eating. Most coordinators believed that attitudes and awareness about healthy eating were key changes that had occurred.

Limitations

Study limitations included: 1) bias due to self-reported program exposure and FV intake, as validation using 24-hr recall and/or biomarkers was not feasible in this study; however, the measures used were previously validated;¹⁹ 2) Lack of documentation of church-wide activities, though some coordinators periodically sent program agendas, flyers, or photographs of activities. This may have hindered our overall assessment about the breadth of activities conducted. 3) Random sampling was not used for recruitment. Rather, the church coordinator recruited the planning committee, participants and PCs through convenience sampling. Thus, participants may not have been representative of the overall

church population. 4) Six months was an insufficient intervention time period for implementing all program pillars or to measure program maintenance.

IMPLICATIONS FOR RESEARCH AND PRACTICE

The results suggest that the disseminated program cannot achieve public health impact unless modifications are made to strengthen support for adequate implementation at the church level. Further investigation is needed to identify: a) factors to promote intervention fidelity; b) appropriate supports for program implementers; c) implementation barriers and facilitators; and d) implementation environments. Based on study results, the following are recommendations for improving program uptake.

- *Assessment of Church Readiness:* Factors for churches to consider include: pastoral and church leadership support, priority of program goals, and availability of resources and dedicated staff.^{27,28} Organizational factors linked to successful implementation include leadership,²⁹ size,^{30,31} skills for planning, implementing and evaluation,³² resources and decision-making structures.³¹ Other colleagues³³ emphasize that “understanding capacity is central to addressing the gap between research and practice.” Organizational factors (e.g., size and resources) may interact with characteristics of the program to be implemented (e.g., program fit with organizational goals),³¹ which in turn may impact how and whether the program is implemented.
- *Technical Assistance (TA):* TA is a key element for successful program uptake and can increase the likelihood of sustainability.^{34–35} The goals of TA are to maintain program implementers’ motivation and commitment, improve skills where needed and support local problem-solving efforts.³⁶ Hannon and colleagues³⁷ suggest that “proactive human contact from a person knowledgeable about the intervention” is critical to dissemination success in faith communities. During dissemination, when researchers’ presence and support is absent, other mechanisms for TA may be required. Volunteers implementing the program may require training on how to overcome barriers, recognize success, network with other volunteers and re-energize programs.³⁸
- *Community Support and TA via Master Trainers or Coalitions:* Successful churches that have already completed the program may be able to “shepherd” churches currently implementing the program. In addition to, or in the absence of TA, a consortium of churches and/or other community-based organizations willing to provide informational support to new churches can be essential.

Dissemination of effective dietary change interventions is a key research priority.^{39,40} The need for proven strategies to promote healthy diets is expected to continue to rise, given the ongoing obesity epidemic and the impact of diet on chronic disease outcomes. Our results suggest that the disseminated Body & Soul program may not produce improvements in FV intake equal to those in the earlier efficacy and effectiveness trials, primarily due to lack of program implementation. Added resources, training, quality control and TA may be necessary to achieve a broad impact.

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Table 1

Socioeconomic Data and Fruit and Vegetable Intake for Body & Soul Participants (n=562)

Variable	Early Intervention (Treatment) (n= 273)	Delayed Intervention (Comparison) (n= 289)	Overall (n= 562)
Age (mean, range)	51.4 (18–86)	51.9 (18–95)	51.6
Gender			
% Female	75.0	73.2	74.0
Marital Status			
% Married or living with a partner	53.4	53.0	53.0
Income (%) *			
<\$30,000	26.0	31.5	28.8
\$30,000–\$49,999	16.1	19.7	18.0
\$50,000	48.7	33.9	41.1
Education (%) *			
<High school	23.2	37.8	30.6
Some college or vocational	29.5	28.8	29.1
Completed college or higher	47.2	33.5	40.3
Baseline Fruit and Vegetable Intake (servings/day) *			
2-item measure	5.7	5.1	5.4
9-item measure	4.9	4.0	4.4

* Difference between early intervention and delayed intervention group were significant at $P<.001$.

Table 2
Fruit and Vegetable Intake for Body & Soul Participants at 6-month Follow-up (Adjusted for Baseline) (n=562)

Outcome (servings/day)	Early Intervention (Treatment)		Delayed Intervention (Comparison)		Difference (EI-DI)		P
	n	Mean (SE)	n	Mean (SE)	Mean (SE)	95% CI	
FV Intake							
2-item	266	5.9 (0.1)	283	5.6 (0.1)	-0.3 (0.2)	-0.7 to 0.1	0.16
9-item	263	4.7 (0.2)	270	4.4 (0.2)	-0.3 (0.3)	-0.9 to 0.4	0.38
Fruit							
1-item	267	2.9 (0.1)	283	2.8 (0.1)	-0.1 (0.1)	-0.4 to 0.2	0.34
Vegetable							
1-item	266	3.0 (0.1)	284	2.9 (0.1)	-0.1 (0.1)	-0.3 to 0.04	0.11
Average of 2-item and 9-item measure	259	5.3 (0.2)	264	5.1 (0.2)	-0.2 (0.2)	-0.7 to 0.3	0.00*

* P 0.05

Table 3

Relationship between Exposure/Perceptions and Primary/ Secondary Outcomes for Body & Soul Early Intervention Group Participants at 6-Month Follow-up (n=273)

Process Variable	% (number responded)	Fruit and Vegetable Intake ^a	SE	2-item	SE	9-item	SE	Fruit and Vegetable Intake ^a	SE	Self Efficacy (SE)	Autonomous Motivation (SE)	
Recall of Body & Soul church events												
Yes	79 (189)	6.15	0.12	5.00	0.43	3.30	0.85	5.87	0.12			
No	21 (49)	5.45	0.23	4.26	0.31	3.29	0.10	5.42	0.09			
<i>P</i> -value		0.05		0.52		0.89		0.19				
If yes, number of events attended												
0	6 (11)	6.90	0.11	4.37	0.35	3.31	0.13	6.19	0.09			
1	37 (65)	5.92	0.21	4.41	0.57	3.25	0.10	5.66	0.18			
2	35 (63)	5.97	0.16	5.70	0.60	3.30	0.10	6.10	0.14			
3	22 (39)	6.79	0.40	6.34	0.66	3.44	0.09	5.95	0.18			
<i>P</i> -value		0.05		0.09		0.36		0.15				
Recall talking with PC ^b (phone/in person)												
Yes	31 (72)	6.39	0.28	5.83	0.59	3.38	0.07	6.80	0.12			
No	69 (160)	5.83	0.18	4.70	0.37	3.26	0.08	5.66	0.11			
<i>P</i> -value		0.02		0.08		0.47		0.02				
If yes, number of calls/conversations												
1 to 2	54 (37)	6.14	0.16	5.39	0.68	3.37	0.07	5.93	0.09			
3 to 4	25 (17)	6.88	0.56	7.40	1.03	3.34	0.11	6.14	0.19			
4	21 (14)	6.43	0.81	5.69	0.92	3.56	0.12	6.29	0.32			
<i>P</i> -value		0.13		0.21		0.42		0.46				
If yes, who spoke more?												
Participant	9 (6)	7.17	0.81	4.68	0.93	3.67	0.09	6.32	0.02			
PC ^b	36 (25)	6.0	0.53	5.16	1.29	3.16	0.12	6.50	0.15			
Same	39 (27)	6.59	0.35	6.64	0.58	3.56	0.06	6.11	0.17			

Process Variable	% (number responded)	Fruit and Vegetable Intake ^a 2-item	SE	Fruit and Vegetable Intake ^a 9-item	SE	Fruit and Vegetable Intake ^a	SE	Self Efficacy (SE)	Autonomous Motivation (SE)	
<i>P</i> value		0.47		0.62		0.05		0.05	0.73	
If yes, quality of PC ^b effort based on MI scale										
	3.75	6.38		5.79		0.91		3.42	0.74	0.16
	3.5–3.75	6.16		5.54		0.88		3.53	0.10	0.14
	3.16–3.5	6.65		5.26		0.79		3.23	0.06	0.20
	<3.5	6.10		5.24		1.26		3.17	0.21	0.29
<i>P</i> value		0.37		0.73				0.21		0.58

^a Adjusted for baseline values

^b PC = Peer Counselor