



Research

Association of Implementation Fidelity With Outcomes of a Distance Learning Lifestyle Change Program Delivered by Cooperative Extension

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Abstract

This prospective observational study examined the implementation fidelity of a distance learning Lifestyle Change Program (LCP) delivered by Cooperative Extension and its associations with three-month outcomes and attendance. Ten certified lifestyle coaches from four states were followed during the first seven sessions through direct observation and monthly self-report checklists. Health outcomes were percentage weight loss and change in weekly physical activity minutes; attendance was examined as a program engagement and dose-received measure. Coaches generally demonstrated high fidelity. Several individual fidelity indicators were associated with physical activity change, and coach engagement in program activities was associated with attendance. Because the study was observational and exploratory, these findings should not be interpreted as causal. The results identify practical targets for coach training, technical assistance, and quality improvement in Extension-based distance delivery.

Introduction

Prediabetes is a common condition that increases the risk for type 2 diabetes. The Centers for Disease Control and Prevention (CDC, 2026) estimates that 115.2 million U.S. adults have prediabetes. The National Diabetes Prevention Program (National DPP) Lifestyle Change Program (LCP) is an evidence-based, year-long intervention intended to prevent or delay type 2 diabetes through healthy eating, increased physical activity, self-monitoring, and behavioral goal setting (Diabetes Prevention Program Research Group, 2002).

Chronic disease prevention and management are priority areas within Extension's National Framework for Health Equity and Well-Being (Hayden-Smith, 2022). Cooperative Extension has collaborated nationally to expand delivery of the National DPP and to adapt the LCP for distance learning formats (Rafie et al., 2021). Real-world research has shown that lifestyle interventions for diabetes prevention can be delivered effectively across diverse community settings and formats (Aziz et al., 2015; Dunkley et al., 2014).

Implementation fidelity is an important component of program quality because it reflects how closely an intervention is delivered as designed (Century et al., 2010; Dane & Schneider, 1998). However, little published research has examined implementation fidelity in distance learning delivery of the LCP, and even less is known about this question in Cooperative Extension settings. Previous fidelity research in behavioral and community interventions suggests that adherence, quality of delivery, and participant responsiveness may each contribute to program implementation (Breitenstein et al., 2010; Gupta et al., 2023). Because definitive core fidelity components have not been established for synchronous distance delivery of the LCP, this study examined candidate structural, instructional, between-session, and participant-responsiveness indicators informed by established fidelity frameworks and PreventT2 delivery expectations. Understanding these indicators may help identify feasible practices for coach support and program quality improvement.

Purpose

The purpose of this study was to assess implementation fidelity of the synchronous

distance learning LCP delivered by Cooperative Extension lifestyle coaches and to examine its associations with early program measures. The health outcomes of interest were percentage weight loss and change in weekly physical activity minutes. Attendance was retained as a program engagement and dose-received measure because it reflects participants' exposure to the intervention, is routinely tracked in CDC-recognized programs, and is operationally important for retention and program delivery. The study examined individual fidelity items as well as structural, instructional, direct-observation total, and self-report total scores.

Method

Study Design and Setting

This prospective observational study evaluated the implementation fidelity of the LCP delivered in a synchronous distance learning format by Cooperative Extension lifestyle coaches and examined associations with early health outcomes and attendance. Program implementation was followed for three months through direct observation and coach self-report checklists. Participant measures were based only on data routinely collected for CDC recognition and program evaluation purposes. The study did not assign coaches or LCP participants to intervention conditions. Institutional review board approval was obtained.

Lifestyle Coaches

A convenience sample of 10 Extension lifestyle coaches was recruited through the Cooperative Extension-National Diabetes Prevention Program working group. The study was introduced during a working-group meeting, followed by an email invitation to members. Eligibility required that coaches be actively delivering a synchronous distance learning LCP through Cooperative

Extension, use the CDC-approved PreventT2 curriculum, and agree to session observation and provision of deidentified routine program data. All participating coaches had completed training to use a CDC-approved curriculum through a CDC-designated training organization and were expected to have the knowledge and skills needed to facilitate the program (CDC, 2024c). Five coaches were from Virginia, two from Alaska, two from Georgia, and one from Washington. Additional coach characteristics, such as education, years of Extension service, and prior coaching experience, were not available for analysis.

LCP Participants

The research team did not separately recruit LCP participants. Deidentified data were obtained for 96 individuals enrolled in the nine participating programs that provided outcome data. Descriptive participant characteristics were summarized for all 96 enrollees. Percentage weight loss and physical activity change were calculated for the 75 participants who attended at least four sessions. This study-specific threshold was derived by proportionally adapting the CDC completer benchmark of at least eight sessions during Months 1-6 to the three-month observation window (CDC, 2024a). The threshold also ensured sufficient early-program exposure and repeated observations for calculating change. Attendance analyses used the available session records. Individual-level eligibility details beyond the routine program data were not available to the research team.

Research Procedures

The first seven sessions of each program were selected for fidelity observation because they represented foundational

early-program content and provided a consistent observation window across programs. The participating programs met weekly and offered 12 sessions during the first three months. Consistent with PreventT2 delivery requirements, 16 sessions were offered during the first six months, and session-level logs were used to record attendance, weight, and physical activity (CDC, 2024a, 2024b). Seven programs were observed live through Zoom, and three were observed using recorded sessions. During live observations, the researcher's video and audio were turned off to minimize disruption.

Measures

Program implementation was assessed with two researcher-designed measures: a direct observation fidelity instrument (Table 1) and a monthly coach self-report checklist (Table 2). These instruments were developed for this study and were informed by the fidelity frameworks of Dane and Schneider (1998), Century et al. (2010), and Gebhart et al. (2020), then mapped to observable PreventT2 delivery expectations. They were not previously validated psychometric scales; rather, they were intended as exploratory measures of candidate implementation indicators. Structural fidelity addressed lesson objectives, lesson introduction, prescribed lesson content, explicit use of or reference to PreventT2 program materials, and time management. Instructional fidelity addressed facilitation of participation, participant responsiveness, coach engagement, coach interest, and preparation. In this study, 'covered lesson content' indicated whether prescribed topics and activities were delivered, whereas 'explicit use of or reference to program materials' indicated whether the coach directly used or directed participants to the PreventT2

guide, handouts, logs, or related materials.

To examine interrater reliability, a second trained coder, who was a member of the research team and a certified Lifestyle Coach familiar with the PreventT2 curriculum and study procedures, independently scored 25% of the recorded sessions. Before coding, she received orientation and training on the fidelity instrument and coding procedures. Percent agreement was calculated (McHugh, 2012). Agreement was 1.00 for most items, 0.89 for Questions 2 and 9, and 0.56 for Question 4. The lower agreement for Question 4 may reflect difficulty distinguishing explicit reference to program materials from general coverage of lesson content. Accordingly, findings involving this item were interpreted cautiously, and further refinement and validation of the measure are warranted.

The monthly self-report checklist was administered electronically at the end of Months 1, 2, and 3. It assessed whether any between-session communication occurred, the frequency of communication across session intervals, make-up sessions, additional between-session activities, the percentage of participants providing food logs, and coach responses to submitted food logs. Questions 1 and 2 were retained because they captured related but distinct dimensions: the presence of any communication and the consistency of communication over the four-session period. Question 5 reflected participant responsiveness to the food-log component, whereas Question 6 reflected coach follow-up. Thus, the checklist included both coach implementation behaviors and participant responsiveness and should be interpreted as an exploratory implementation index rather

than a unidimensional validated scale. Higher scores indicated greater implementation of the assessed activities.

Health outcomes were percentage weight loss and change in average weekly physical activity minutes during the first three months; attendance was examined separately as an engagement and dose-received measure. In accordance with National DPP program procedures, attendance, body weight, and physical activity minutes were recorded at sessions, including through electronic reporting in distance delivery (CDC, 2024a, 2024b). Percentage weight loss was calculated from beginning weight to the last reported weight. Physical activity change was calculated as the difference between the average of the first 2 weeks of reported activity and the average of the last 2 weeks. Participant demographic data included age, sex, race, and education.

Data Analysis

Python was used to clean the data, check for duplicate or out-of-range values, impute missing physical activity values using the next valid point from the same participant, compute fidelity scores, and fit analytic models. Descriptive statistics summarized direct-observation fidelity, self-report checklist scores, coach and program participation, LCP participant characteristics, and participant measures. Descriptive fidelity analyses included all 10 programs; association analyses included the nine programs that provided participant data.

Linear mixed-effects models examined associations between fidelity measures and percentage weight loss, physical activity change, and attendance while accounting for clustering within LCP programs. Fixed effects included

individual fidelity items and, in separate models, structural, instructional, direct-observation total, and self-report total scores; the random effect was the program-level intercept. Attendance was modeled as an engagement and dose-received measure rather than a health outcome. Because this was an observational, exploratory study with a small number of programs and multiple tested associations, coefficients and *p* values were interpreted as hypothesis-generating associations rather than evidence of causal effects.

Results

Fidelity of Implementation

Descriptive fidelity results included all 10 programs. Direct observation indicated generally high implementation fidelity. Coaches received their highest average scores for meeting lesson objectives, introducing the lesson, coach engagement, coach interest, and session preparedness (Table 3). Participant responsiveness during program activities had the lowest average score. Explicit use of or reference to program materials showed the widest range across programs and also had the lowest interrater agreement, so this item should be interpreted with particular caution.

Self-report checklist results also suggested frequent between-session communication (Table 4). Nearly all programs reported at least some communication with participants between sessions, and scores for consistency of communication were high. Make-up sessions and food-log follow-up varied more across programs, while additional between-session activities were reported less often.

LCP Participant Characteristics and Measures

Nine of the 10 programs provided three-month LCP participant data. Across those programs, 96 individuals enrolled, and 75 (78%) attended at least four sessions and were included in weight and physical activity change calculations. The mean age was 54.09 years, and the median age was 58 years. Participants were primarily female (61%), and 62% reported a college education of 4 years or more (Table 5).

Participants attended an average of 10 sessions ($SD = 2.74$) during the first three months. Average weight loss was 1.92% ($SD = 2.65$). Average reported physical activity increased from 175 minutes per week ($SD = 142$) at the beginning of the program to 183 minutes ($SD = 140$) at three months, a mean increase of 8 minutes ($SD = 146$) (Table 6). The relatively high baseline physical activity level indicates that this sample entered the program with substantial reported activity.

Associations Between Fidelity, Health Outcomes, and Attendance

Several individual fidelity indicators were statistically associated with early participant measures (Table 7). Meeting lesson objectives, covering lesson content, explicit use of or reference to program materials, and participant responsiveness during program activities were associated with physical activity change. Coach engagement in program activities was associated with attendance. No individual direct-observation item showed a statistically significant association with percentage weight loss. The direction of associations was not uniformly positive; for example, greater explicit reference to program materials was associated with lower physical activity change. Given the small number of

programs, exploratory testing of multiple items, and lower reliability of that item, these results should not be interpreted as evidence that any fidelity behavior caused the observed outcomes.

Structural, instructional, overall direct-observation, and self-report summary scores were also examined in separate models. None of these summary scores was statistically associated with percentage weight loss, physical activity change, or attendance. This pattern suggests that individual candidate indicators may provide different information than broad composite scores, but the finding requires confirmation in larger studies.

Discussion

Summary of Findings

This study examined implementation fidelity of a synchronous distance learning LCP delivered by Cooperative Extension and its associations with early health outcomes and attendance. Coaches demonstrated high fidelity on most observed structural and instructional indicators. Several individual indicators were associated with physical activity change, and coach engagement was associated with attendance; however, global fidelity scores were not associated with the measured outcomes. These findings are exploratory and should be understood as associations rather than causal effects. The study extends previous implementation fidelity research in community and behavioral diabetes prevention settings to synchronous distance delivery within Cooperative Extension (Breitenstein et al., 2010; Gupta et al., 2023; Rafie et al., 2021). The researcher-designed observation and self-report approach was feasible across multiple states and delivery contexts,

supporting continued refinement and evaluation of this model. At the same time, the assessed items should be viewed as candidate implementation indicators rather than confirmed core components of the LCP. The lack of associations for structural, instructional, and total scores, together with variation across individual items, suggests that future research should determine which delivery behaviors are essential, which are adaptable, and how participant responsiveness contributes to program effects.

The distinction between content coverage and explicit reference to program materials is particularly important. Coaches may deliver prescribed concepts through discussion, examples, or adaptation without repeatedly directing participants to a guide or handout. The lower interrater agreement and inverse association observed for the explicit-reference item indicate that this construct requires clearer operationalization before it is used for performance assessment. Similarly, participant engagement and food-log submission represent participant responsiveness or dose received, not solely coach adherence. Separating these dimensions in future instruments would improve interpretability.

Implications for Extension

For Cooperative Extension professionals, the results suggest that fidelity monitoring may help focus coach training and technical assistance on observable practices such as clear lesson objectives, complete content delivery, purposeful facilitation, and participant follow-up. Attendance can be monitored alongside health outcomes as an indicator of participant exposure and retention. A brief, well-defined fidelity tool could also help programs use limited staff time and technical-assistance resources more

strategically by identifying where support is most needed. Before routine adoption, however, the measures should be refined, tested with larger and more diverse samples, and evaluated for reliability and validity.

Limitations

This study has several limitations. The convenience sample included only 10 coaches from four states and was not nationally representative. Coach education, professional experience, and prior LCP delivery experience were not available, limiting the ability to examine variation among coaches or states. Only nine programs supplied LCP participant data, and outcomes were limited to the first three months of a 12-month program. The researcher-designed fidelity measures were informed by established frameworks but were not fully validated; one item had low interrater agreement, and related self-report items may have given additional weight to communication behaviors. Some measures reflected participant responsiveness rather than coach adherence. Physical activity was reported by participants, and the high baseline mean of 175 minutes per week suggests that this sample may have been more active than other populations entering diabetes prevention programs or may have had limited room for improvement. The small number of programs and multiple exploratory models also increase the possibility of chance findings. Because the study was observational, all findings should be interpreted as associations rather than causal effects.

Conclusion

The synchronous distance learning LCP delivered by Cooperative Extension showed generally high implementation

fidelity in this multi-state sample. The exploratory findings indicate that specific delivery behaviors and participant responsiveness may provide more actionable information than broad fidelity totals, although the observed associations require confirmation. Refining and validating brief fidelity measures could support coach development, participant retention, and efficient quality improvement in Extension-based diabetes prevention programs.

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References

- Aziz, Z., Absetz, P., Oldroyd, J., Pronk, N. P., & Oldenburg, B. (2015). A systematic review of real-world diabetes prevention programs: Learnings from the last 15 years. *Implementation Science*, 10(1), 172. <https://doi.org/10.1186/s13012-015-0354-6>
- Baer, J. S., Ball, S. A., Campbell, B. K., Miele, G. M., Schoener, E. P., & Tracy, K. (2007). Training and fidelity monitoring of behavioral interventions in multi-site addictions research. *Drug and Alcohol Dependence*, 87(2-3), 107-118. <https://doi.org/10.1016/j.drugalcdep.2006.08.028>
- Breitenstein, S. M., Gross, D., Garvey, C. A., Hill, C., Fogg, L., & Resnick, B. (2010). Implementation fidelity in community-based interventions. *Research in Nursing & Health*, 33(2), 164-173. <https://doi.org/10.1002/nur.20373>
- Centers for Disease Control and Prevention. (2024a). CDC Diabetes Prevention Recognition Program: Standards and operating procedures. <https://doi.org/10.15620/cdc/251679>
- Centers for Disease Control and Prevention. (2024b, May 15). PreventT2 curriculum and handouts. <https://www.cdc.gov/diabetes-prevention/php/lifestyle-change-resources/t2-curriculum.html>
- Centers for Disease Control and Prevention. (2024c, May 15). Staffing and training for the National Diabetes Prevention Program. <https://www.cdc.gov/diabetes-prevention/php/program-provider/staffing-and-training.html>
- Centers for Disease Control and Prevention. (2026, January 21). National diabetes statistics report. <https://www.cdc.gov/diabetes/php/data-research/index.html>
- Century, J., Rudnick, M., & Freeman, C. (2010). A framework for measuring fidelity of implementation: A foundation for shared language and accumulation of knowledge. *American Journal of Evaluation*, 31(2), 199-218. <https://doi.org/10.1177/1098214010366173>
- Dane, A. V., & Schneider, B. H. (1998). Program integrity in primary and early secondary prevention: Are implementation effects out of control? *Clinical Psychology Review*, 18(1), 23-45. [https://doi.org/10.1016/S0272-7358\(97\)00043-3](https://doi.org/10.1016/S0272-7358(97)00043-3)
- Diabetes Prevention Program Research Group. (2002). The Diabetes Prevention Program (DPP): Description of lifestyle intervention. *Diabetes Care*, 25(12), 2165-2171.
- Dunkley, A. J., Bodicoat, D. H., Greaves, C. J., Russell, C., Yates, T., Davies, M. J., & Khunti, K. (2014). Diabetes prevention in the real world: Effectiveness of pragmatic lifestyle interventions for the prevention of type 2 diabetes and of the impact of adherence to guideline recommendations: A systematic review and meta-analysis. *Diabetes Care*, 37(4), 922-933. <https://doi.org/10.2337/dc13-2195>
- Gebhart, K., Kattelman, K., Wey, H., et al. (2020). Fidelity of implementation of train-the-trainer methodology for delivery of a preschool nutrition and physical activity curriculum. *European Journal of Educational Research*, 9(4), 1483-1490. <https://doi.org/10.12973/eu-jer.9.4.1483>
- Gupta, A., Hu, J., Huang, S., et al. (2023). Implementation fidelity to a behavioral diabetes prevention intervention in two New York City safety net primary care practices. *BMC Public Health*, 23(1), 575. <https://doi.org/10.1186/s12889-023-15477-2>

- Hayden-Smith, R. (2022, May 9). Extension's national framework for health equity and well-being. Connect Extension.
<https://connect.extension.org/db/epublications/record/extension-s-national-framework-for-health-equity-and-well-being>
- McHugh, M. L. (2012). Interrater reliability: The kappa statistic. *Biochemia Medica*, 22(3), 276-282.
- Rafie, C., Johnson, N., Welshon, K., Javandi, S., Berg, A., & Da Silva, V. (2021). Distance learning for delivery of the diabetes prevention program: Experiences of the Cooperative Extension National Diabetes Prevention Program Working Group. *Journal of the National Extension Association of Family & Consumer Sciences*, 16, 116-121.
- Saunders, R. P., Wilcox, S., Baruth, M., & Dowda, M. (2014). Process evaluation methods, implementation fidelity results and relationship to physical activity and healthy eating in the Faith, Activity, and Nutrition study. *Evaluation and Program Planning*, 43, 93-102. <https://doi.org/10.1016/j.evalprogplan.2013.11.003>

Tables

Table 1. Direct Observation Fidelity Measurement Instrument

Question/Content	Operational definition	Response coding
Structural components		
1) Met the lesson objectives	Extent to which the session addressed the stated objectives for the module.	Yes = 2 Partial = 1 No=0
2) Coach introduced the lesson	Coach stated or oriented participants to the lesson topic and purpose.	Yes = 2 Partial = 1 No=0
3) Covered lesson content	Coach delivered the prescribed topics and activities for the observed module.	Yes = 2 Partial = 1 No=0
4) Explicitly used or referred to program materials	Coach directly used or directed participants to PreventT2 guides, handouts, logs, or related materials.	Often=2 Rarely=1 Unobserved=0
5) Session time management	Coach paced the session and completed planned content within the available time.	Good = 2 Neutral = 1 Poor = 0
Instructional components		
6) Coach effectiveness in encouraging group participation	Coach invited questions and discussion, used prompts, and created opportunities for participants to contribute.	Veryeffective=2 Neutral=1 Ineffective=0
7) Participant responsiveness during program activities	Participants responded to prompts, joined discussions, or completed session activities; this item reflects participant responsiveness/dose received.	Veryengaged=2 Somewhat engaged=1 Notengaged=0
8) Coach engagement in program activities	Coach actively facilitated and participated in planned activities rather than only presenting information.	Very engaged = 2 Somewhat engaged = 1 Not engaged = 0
9) Coach interest in the session	Coach demonstrated observable attention, enthusiasm, and interest in the topic and participant discussion.	Very interested=2 Somewhatinterested=1 Little interested=0
10) Coach prepared for the session	Materials, technology, and lesson content appeared organized and ready for delivery.	Well prepared= 2 Somewhat prepared = 1 Not prepared = 0

Note. The instrument included coach adherence and delivery-quality indicators as well as participant responsiveness. Question 7 reflects participant responsiveness/dose received rather than coach adherence alone.

Table 2. Self Report Checklist

Question/Content	Response coding
1) Did you have between-session communication with your LCP participants during the past 4 sessions?	Yes = 1 No = 0
2) During how many of the past 4 session intervals did you send communication to participants?	Between all 4 sessions = 3 Between 3 sessions = 2 Between 2 sessions = 1 Never = 0
3) Did you conduct make-up sessions during the last four sessions?	Always = 3 Sometimes = 2 Rarely = 1 Never = 0 Not needed = no participant missed a session
4) Did the group have any additional between-session activities in the last month?	Yes = 1 No = 0
5) Over the last four sessions, what percentage of LCP participants provided a food log to review?	All participants = 3 More than 50% = 2 Less than 50% = 1 Nobody = 0
6) In the past four weeks, how often did you respond to LCP participants who provided a food log?	Always = 3 Sometimes = 2 Rarely = 1 Never = 0

Note. Question 1 captured whether any communication occurred; Question 2 captured its consistency across the four-session period. Question 5 reflects participant responsiveness to food-log requests, whereas Question 6 reflects coach follow-up. Questions 5 and 6 were administered beginning in Month 2.

Table 3. Structural and Instructional Fidelity Summary Scores

Measure	Mean	SD	Min	Max	Maximum possible
Structural components					
1) Met the lesson objectives	1.90	0.25	1.29	2.00	2
2) Coach introduced the lesson	1.89	0.15	1.57	2.00	2
3) Covered lesson content	1.57	0.35	1.14	2.00	2
4) Explicitly used or referred to program materials	1.43	0.33	0.86	2.00	2
5) Session time management	1.56	0.27	1.14	1.93	2
Sum of structural scores	8.36	0.28	8.00	8.80	10
Instructional components					
6) Coach effectiveness in encouraging group participation	1.56	0.37	1.00	2.00	2
7) Participant responsiveness during program activities	1.28	0.22	1.00	1.57	2
8) Coach engagement in program activities	1.93	0.11	1.70	2.00	2
9) Coach interest in the session	2.00	0.00	2.00	2.00	2
10) Coach prepared for the session	1.93	0.11	1.17	2.00	2
Sum of instructional scores	8.70	0.46	8.14	9.43	10
Total direct-observation fidelity score	17.05	0.62	16.29	18.29	20

Note. SD = standard deviation; Min = minimum; Max = maximum. Item scores are averages across observed sessions; maximum possible values are theoretical maxima.

Table 4. Self-Report Checklist Summary Fidelity Scores

Measure	Mean	SD	Min	Max	Maximum possible
1) Any communication between sessions	0.97	0.12	0.67	1.00	1
2) Consistency of communication between sessions	2.88	0.35	2.00	3.00	3
3) Make-up session	1.88	1.01	0.20	3.00	3
4) Additional between-session activities	0.29	0.42	0.00	1.00	1
5) Percentage of participants providing a food log	1.19	0.59	0.00	2.00	3
6) Coach response to food-log activity	2.00	0.80	0.50	3.00	3
Total self-report fidelity score	9.19	1.55	7.00	11.33	14

Note. SD = standard deviation; Min = minimum; Max = maximum. Questions 5 and 6 were administered beginning in Month 2. The maximum possible score shown for the total reflects all six items.

Table 5. Lifestyle Change Program Participant Demographics (N = 96)

Characteristic	n (%)
Age < 65 years	76 (79%)
Age ≥ 65 years	20 (21%)
Female	58 (61%)
Male	9 (9%)
Sex not reported	29 (30%)
White	47 (49%)
African American	25 (26%)
Asian	2 (2%)
Native Hawaiian or Other Pacific Islander	1 (1%)
Race not reported	21 (22%)
Some college or technical school	26 (28%)
College graduate or more	60 (62%)
High school graduate or GED	7 (7%)
Less than high school	1 (1%)
Education not reported	2 (2%)

Table 6. Average Three-Month Participant Measures (N = 96)

Measure	Value
Average attendance, sessions (SD)	10.00 (2.74)
Average weight loss percentage (SD)	1.92% (2.65)
Average physical activity at baseline, minutes/week (SD)	175 (142)
Average physical activity at 3 months, minutes/week (SD)	183 (140)
Average change in physical activity, minutes/week (SD)	8 (146)

Table 7. Associations of Health Outcomes and Attendance With Structural and Instructional Fidelity Items

Fidelity item	Weight loss percentage	Physical activity change	Attendance
1) Met the lesson objectives	-0.12 (-3.26, 3.01)/p=.94	220.30 (44.26,396.34) / p = .01*	-3.58 (-9.35, 2.20)/p = .23
2) Coach introduced the lesson	-2.88 (-8.03, 2.27)/p=.27	131.97 (-277.13, 541.08) / p = .53	6.95 (-2.20, 16.09)/p = .14
3) Covered lesson content	-0.06 (-2.55, 2.42)/p=.96	132.24 (2.12, 262.36) / p = .05*	1.04 (-3.66, 5.74)/p = .66
4) Explicitly used or referred to program materials	0.34 (-1.71, 2.38)/p=.75	-169.39 (-290.61, -48.17) / p = .01*	1.08 (-3.71, 5.87)/p = .66
5) Session time management	-0.30 (-3.17, 2.57)/p=.84	-117.63 (-313.89, 78.64) / p = .24	0.89 (-5.06, 6.83)/p = .77
6) Coach effectiveness in encouraging group participation	0.22 (-1.82, 2.26)/p=.83	-123.64 (-250.01, 2.73) / p = .06	1.78 (-2.47, 6.03)/p = .41
7) Participant responsiveness during program activities	0.39 (-3.31, 4.09)/p=.84	214.99 (3.81, 426.17) / p = .05*	0.10 (-7.32, 7.52)/p = .98
8) Coach engagement in program activities	-1.48 (-8.44, 5.47)/p=.68	-147.93 (-718.59, 422.73) / p = .61	11.43 (0.08, 22.77)/p = .05*
9) Coach interest in the session	Not estimable	Not estimable	Not estimable
10) Coach prepared for the session	-4.35 (-8.77, 0.07) / p = .05	337.34 (-142.55, 817.23) /p = .17	-3.26 (-18.07, 11.54) / p=.67

Note. Values are coefficient (95% confidence interval) / p value. An asterisk indicates $p \leq .05$. Question 9 was not estimable because all observed programs received the maximum score. FOI = fidelity of implementation.