Exploring the Delivery and Effects of the Enhanced Coach-led Marathon Kids Model: A Pilot Study

FINAL REPORT

August 30, 2019

Report prepared by: Andrew Springer, DrPH, Kelley Pettee Gabriel, MS, PhD, FACSM, & Makenzie Harris, MPH

UTHEALTH SCHOOL OF PUBLIC HEALTH – MICHAEL & SUSAN DELL CENTER FOR HEALTHY LIVING
1616 GUADALUPE STREET, SUITE 6.300, AUSTIN, TX 78701

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Acknowledgements

We express our sincere thanks to our partner study schools, school districts, students, and PE teachers from central Texas, as well as Marathon Kids coaches from central Texas and throughout the United States, for their excellent support and participation with the implementation of this pilot study. Felisa Ruiz, MPH student at the University of Texas Health Science Center at Houston (UTHealth) School of Public Health-Austin, and Yolanda Guzman, undergraduate student at St. Edward's University and a Dell Health Undergraduate Scholar, provided key support with various facets of the project, including data collection, qualitative analysis, and review of the final report- support for which we are most grateful. We also recognize Dr. Bill Kohl, Professor of Epidemiology at the UTHealth School of Public Health, for insightful guidance with the initial development of this study. Lastly and importantly, we express our sincere appreciation to the Marathon Kids leadership team in Austin, Texas, with specific thanks to Cami Hawkins, Desma Deitz, Stephanie Ediger, and Brandon Trodick for their instrumental support and collaboration with the development and implementation of this study. Funding for this study was provided by Marathon Kids.

Executive Summary

Background: Marathon Kids is an international, nonprofit organization that promote children's physical activity via family, school and community-based walking and running clubs. This exploratory pilot study of Marathon Kids aimed to generate insights about the short-term effects of participation in Marathon Kids on elementary school-aged children's physical activity and related intrapersonal factors (e.g., self-efficacy) as well as the barriers and best practices for delivery of Marathon Kids as informed by Marathon Kids (MK) coaches from Texas and across the U.S.

Methods: The study was based in a mixed methods approach organized by three primary studies: 1.) a matched comparison group, pretest/posttest study; 2.) a Marathon Kids Coach Finisher Survey cross-sectional study; and 3.) a Marathon Kids Star Coach in-depth interview study.

For the *matched comparison group study*, children's physical activity and related intrapersonal factors were assessed in the fall and spring of the 2018-19 school year and compared between 3rd-5th grade students attending n=3 MK schools (n=68 students) with same-aged students of similar demographics in n=3 matched non-MK comparison schools (n=96 students). Primary assessment methods consisted of: a.) objectively assessed physical activity (PA) using accelerometers; b.) self-reported PA based in the PAQ-C via questionnaire; and c.) self-reported PA related intrapersonal factors (e.g., athletic identity self-concept, attitudes, self efficacy) via questionnaire. In addition, marathons completed and student satisfaction were also assessed.

The Finisher Survey was an online survey with closed and open-ended implementation and best practice-related items administered to MK coaches from across the U.S. from 2018-19 (n=478).

The MK Star Coach Interview consisted of in-depth interviews conducted in spring 2019 with n=6 high performing MK coaches to explore best practices and recommendations for MK program implementation. Quantitative analyses included descriptive statistics, paired t-tests to assess pre and posttest differences within study condition, and one-way analysis of covariance (ANCOVA) to assess posttest differences in study outcomes. Qualitative analysis of open-ended MK coach questions and interview data was based on thematic content analysis.

Findings:

Matched comparison group study: No significant differences were found between students in MK schools and comparison schools for accelerometer-derived MVPA daily minutes, mean PAQ-C scores (self-reported physical activity), or intrapersonal outcomes after adjusting for gender, ethnicity and baseline estimates ($p>.05$). Process-related findings provide further context for the lack of differences. First, while opportunity exists for increasing student MVPA engagement, students in both MK schools and comparison schools engaged in a relatively high average number of minutes of daily MVPA (52.3 minutes and 56.9 minutes, respectively, averaged across the two measurement periods) in relation to recommendations of 60 minutes of daily physical activity.

Second, despite positive implementation impact findings of MK that included high completion of marathons by students (85% completed 1 or more; 62% completed two or more marathons over school year) and overall high student ratings of MK, comparison schools provided similar or increased opportunities for physical activity engagement. These opportunities included an average of 2-3 days of physical education class per week, with an average of 55 minutes scheduled per class, compared to 2 times per week for MK schools- with an average of 45 minutes scheduled per class, as well as implementation of one running club in the comparison school and tracking of miles run/walked in all comparison schools- key facets of the MK model.

Finisher Survey & Star Coach Interview: Key findings generated from these studies with MK coaches (n=478) from Texas and across the United States (n=35 states) included:

- A *high reach of the Marathon Kids program* across the United States (n=65,163 children in grades 1st through 12th reached from across 35 states in the U.S.).
- *Positive impact on delivery of children's physical activity* as assessed by *marathons completed*, with MK coaches reporting 86.4% of student participants having completed ≥ 1 marathon, with just under half (49%) completing ≥3 marathons (the equivalent of 78.6 miles walked or run during the course of the school year). *[Note: Numbers are based on total sample surveyed, not on specific targeted marathon goals for a given club].*
- *Positive impact on delivery of children's physical activity* as assessed by *minutes scheduled*, with MK coaches reporting an average of 112 minutes provided during the school week, representing an average of 22.4 daily minutes of walking/running via the program.
- *High satisfaction of MK coaches* with the Marathon Kids program based on a composite satisfaction score that includes items such as "I enjoyed doing MK very much this year" and "I would recommend MK to a friend/colleague" (mean MK satisfaction score of 50.6, with 56 representing the highest possible score).
- *High satisfaction with support received by MK coaches from MK staff.*
- *Identification of a range of innovative and promising best practices* for implementing various facets of Marathon Kids, including: general organization and planning of running clubs, student recruitment, club approach and activities, tracking and logging miles, and promotion and communication approach, among others.

Conclusion: Findings from this pilot study provide greater insights into the impact, reach, and best practices of the Marathon Kids program as well as future research considerations. While the lack of differences in primary outcomes between study conditions from the matched comparison group study merits further exploration, the differences between schools in the two study conditions- with similar or increased opportunities for PA in the comparison schools, may point to the role of structural differences (e.g., increased schedule of PE) in diluting the impact of the MK program- thus underscoring the importance of finding more comparable study schools for future research. Findings from the Finisher Survey and Star Coach Interview underscore important strengths of the Marathon Kids program, including high levels of satisfaction of MK coaches and student

participants, a wide reach of the program across the U.S., implementation-related impact that includes student marathons completed and scheduled minutes for physical activity within schools and out-of-school time settings, and a range of MK coach-informed best practices for program implementation in relation to the MK program pillars. Strengths and lessons learned documented in this study provide a strong foundation for the overall approach of Marathon Kids as well as an opportunity for further engaging and co-learning with the vibrant Marathon Kids' community about best practices for advancing Marathon Kids' mission of providing a path for healthy youth development through running.

Introduction

Despite the multiple benefits of habitual physical activity, less than half of U.S. elementary school-aged children (42.5%) meet recommendations of sixty minutes or more of daily physical activity based on accelerometer assessment (National Physical Activity Plan, 2016; 2018). In Texas, statewide prevalence estimates based on self-report indicate that only 23% of 2nd grade students and 9% of 4th grade students meet daily recommendations of physical activity (Hoelscher et al., 2016), reflecting global trends of low physical activity engagement in young people (Sallis et al., 2016). Given the low prevalence of physical activity in children as well as the decline of physical activity as children transition to adolescence (Dumith et al., 2011), enhanced efforts are urgently needed to support and promote young people's physical activity engagement.

Marathon Kids is an international, nonprofit organization that promotes young people's physical activity via family, school and community-based walking and running clubs. Research on the initial model of Marathon Kids found that elementary school children who participated in Marathon Kids reported significantly higher past 7-day physical activity and intrapersonal factors such as athletic identity self-concept compared to students in non-participating schools (Springer et al., 2010). Since this initial research, the Marathon Kids program has undergone several notable enhancements, presenting an important need as well as opportunity to learn about best practices for delivery of the new model as well as its effects on children's physical activity and related factors.

In contributing to ongoing learning about Marathon Kids' current model, researchers based at the UTHealth School of Public Health-Austin conducted a pilot study during the 2018-19 school year aimed at exploring both the delivery of Marathon Kids in the elementary school setting, including the role of the coach and best practices for implementation of Marathon Kids, as well as the short-term effects of participation in Marathon Kids running clubs on elementary school students' moderate and vigorous physical activity (MVPA) and related intrapersonal factors (e.g., athletic identity self-concept, physical activity self-efficacy, and outcome expectations/motivations for physical activity). In the following report we present findings from the *"Active Kids Project"*, an exploratory study of Marathon Kids which encompassed three primary assessments:

- *A matched comparison group pilot study* comparing physical activity and related intrapersonal factors among students attending Marathon Kids (MK) schools (n=3) with students attending comparison schools (n=3) that did not participate in MK in 2018-19.
- *An online "Finisher" survey* with Marathon Kids coaches from throughout the U.S. to explore the delivery of Marathon Kids, including implementation best practices and challenges.
- *A "Star Coach" in-depth interview* conducted with six high performing Marathon Kids coaches with the aim of identifying best practices for MK program delivery.

Study Aims

The specific aims of the Marathon Kids Pilot Study were to:

1.) Assess the effect of participation in Marathon Kids (MK) schools on 3rd-5th grade elementary school students' engagement in overall physical activity (light to vigorous intensity) and MVPA as well as related intrapersonal factors (e.g., athletic identity, PA self efficacy, PA outcome expectations) in a sample of 6 low-income central Texas schools (n=3 MK schools and n=3 comparison schools). *(Matched Comparison Group study).*

2.) Describe the implementation of Marathon Kids in elementary schools and the out-of-school-time setting among schools participating in the *MK pilot matched comparison group study* as well as coaches from across the U.S. participating in the *Marathon Kids Coach Finisher Survey*.

3.) Explore the barriers and facilitating factors for implementation of Marathon Kids, including the best practices for program implementation, among coaches participating in the *matched comparison group pilot study, Finisher Survey* and *Star Coach Interviews*- which consisted of interviews with high performing Marathon Kids coaches.

Marathon Kids: Program Overview

Marathon Kids is a nonprofit organization that was founded in 1995 by Kay Morris, whose initial vision of the program was rooted in the idea that all children- no matter their athletic ability- should have the opportunity to experience 'the lifelong joy of movement'. The simplicity of the initial Marathon Kids program model, which includes the promotion of children's walking and running through support with goal setting, tracking of miles walked/run, and celebration of miles walked/run, is arguably a key strength of the Marathon Kids program. Since Marathon Kids' initial creation, the program has continued to build on Kay's vision and easy-to-implement model through expansion to states across the U.S. as well as the United Kingdom, partnerships with organizations such as Nike, and several promising innovations.

Among the principal innovations of the current Marathon Kids model has been the activation of local school and community leaders via the establishment of the *Marathon Kids Coach* role. The *Marathon Kids Coach* provides key leadership for the implementation of the running clubs in the before, during and out-of-school-time settings while providing positive mentoring, social support, and overall inspiration for young people's engagement in physical activity. Other notable enhancements to the model have included: support for children's completion of not one, but up to four marathons over the course of a school year; implementation of Marathon Kids in a diversity of

settings (school, afterschool, home, camps); innovations with tracking of miles run or walked; and coach training via the Marathon Kids *Leadership Academy*.

Lastly, *six core pillars* now provide the foundation for the enhanced model (see Box A). These pillars represent positive behavior change methods rooted in health behavior theories such as Social Cognitive Theory (Bandura, 1986), empirical evidence (Bartholomew et al., 2016), and best practice for child health promotion. Further research with Marathon Kids coaches in Texas and throughout the U.S. offers the opportunity to provide insights about how specific facets of these pillars are being implemented as well as opportunities for further supporting coaches with overall Marathon Kids (MK) program delivery. Further details about the MK program are provided via the MK website.

Box A. Six Pillars of the Marathon Kids Program

1.) ***Goal Setting:*** Children learn to set and meet small and big goals, including goals for walking/running.

2.) ***Tracking:*** Children track miles walked/run individually or as a group. *"Logging miles means seeing progress and staying motivated."*

3.) ***Modeling the Way*:** Coaches and others provide modeling for children.

4.) ***Social Support*:** Parents, volunteers, friends provide social support for children's physical activity.

5.) ***Celebrating:*** Celebrating achievements, including completion of marathons.

6.) ***Rewards:*** Positive reinforcement for physical activity is provided via rewards that include t-shirts and water bottles.

While it is common to create a logic model in developing a program evaluation, given the pilot and exploratory nature of this study, we made the decision to hold off on the creation of a logic model in order to allow our qualitative findings to further inform the content of a program logic model once this study has concluded. We also see great value in the development of a logic model, building from insights provided by this study, in direct collaboration with Marathon Kids staff and community stakeholders as per a 'community-facilitated logic model' approach (Healthy Wisconsin Leadership Institute, 2019) versus a traditional approach of having an external consultant create the logic model for the organization. The co-creation of a logic model that builds from the findings from this study holds promise to incorporate further insights from Marathon Kids staff, coaches, and other stakeholders while creating more ownership for the overall program. The six pillars of the Marathon Kids program will no doubt provide key foundation for the development of a Marathon Kids program logic model. For this current study, the Marathon Kids program pillars served to guide and frame our measures and analysis.

Methods

Below we describe the study designs, study populations, study measures, and analytic approach for the Marathon Kids pilot study "Active Kids Project" as organized by the three assessments and study aims *(see Appendices A-D for study measures and protocols)*.

Matched Comparison Group Pilot Study

Study Aim 1: Assess the effect of participation in Marathon Kids (MK) schools on 3rd-5th grade elementary school students' engagement in overall physical activity (light to vigorous intensity) and MVPA as well as related intrapersonal factors (e.g., athletic identity, PA outcome expectations, PA self efficacy,) in a sample of 6 low-income central Texas schools.

Study Design & Study Population

A matched comparison group, pretest/posttest design guided the *matched comparison group study*. Specifically, physical activity engagement and related intrapersonal factors were assessed at the beginning and end of the 2018-19 school year and compared between 3rd-5th grade students attending n=3 MK schools with same-aged students of similar demographics in n=3 matched non-MK comparison schools (Figure 1). In forming the study sample, six low-income public elementary schools from central Texas were recruited to participate in the pilot study (n=3 MK schools and n=3 comparison schools), with the goal of recruiting 25 students per school for a total of 150 students. MK school selection was made in concert with MK staff with the aim of identifying a high performing school district and schools that have successfully implemented in the program in recent years. We also intentionally selected schools that had a higher composition of economically disadvantaged students given evidence of a higher risk of lower physical activity among this population (Richmond et al., 2006) as well as higher obesity rates (Shrewsbury & Wardle, 2008; Rossen & Schoendorf, 2012). Selected MK schools from one central Texas school district were then matched with comparison schools from a neighboring school district on composition of economically disadvantaged students and student ethnicity. Schools received financial support of $500 (intervention) to $750 (comparison) to participate in the study; comparison schools were also invited to participate in MK for 2019-20 at no cost. Of note, comparison schools had expressed interest to participate in Marathon Kids, and the comparison school district had participated in Marathon Kids in past years.

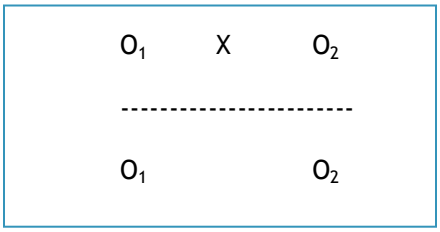

Figure 1. Matched comparison group, pretest/posttest study design (n=6 schools, with "O"=observation and "X"= intervention). *Marathon Kids Pilot Study,* 2018-2019

While we initially aimed to recruit students in 4th grade, we expanded recruitment to include grades 3-5 for schools with low numbers of 4th grade students. Students were invited to participate in the study via a verbal invitation to students provided in their PE class and a written invitation and informed consent form sent to parents. Active parental consent and student assent were required

for student participation in the study. Students received small incentives (e.g., wristbands; balls) to return the consent forms.

Study Measures and Procedures

The primary assessment methods and measures for the matched comparison group study consisted of: a.) objectively assessed physical activity (PA) using accelerometers; b) self-reported PA based in the PAQ-C; and c.) self-reported PA related intrapersonal factors (e.g., athletic identity self-concept, PA outcome expectations, barrier PA self efficacy). Self-reported measures were implemented via a self-administered questionnaire (see below). In addition, we included student-specific process-related measures related to student number of marathons completed and satisfaction with the Marathon Kids program. Appendix A includes the 27-item questionnaire that was used to collect student self reported data on *physical activity, intrapersonal factors, process-related outcomes, and demographics* (see below for detail). Assessments were made during the 2018-19 school year, with a baseline assessment conducted between November 2018 and January 2019, and a posttest conducted during the months of March-May of 2019. In addition to our student-focused assessments, we also conducted an end-of-year interview with lead PE teachers from each study school to garner insights about implementation of the MK program (intervention schools) and other school-based physical activity actions (comparison schools) (see Appendix B). Below, we describe the study measures and data collection procedures.

Physical Activity Measures

Physical activity was assessed using both accelerometer assessment and self-report, as described below.

Accelerometer Assessment: Accelerometer-derived estimates of time spent in sedentary and in light-, moderate-, and vigorous- intensity physical activity were assessed using the Actigraph wGT3X-BT, triaxial accelerometer (Pensacola, FL) in a subsample of students. In conducting the accelerometer assessment, we randomly selected n=20 students (10 boys and 10 girls) from each study school to wear the accelerometers. Students were instructed to wear the accelerometer for 7 consecutive days, from the time they got out of the bed in the morning until they went to bed at night except during water-based activities such as showering and swimming activities. Accelerometers were initialized to begin data collection at 12:00am on the day the monitors were distributed to students at school, and raw data were sampled at 40 Hz. After 7 days of wear, accelerometers were collected by school staff, and returned to study staff. Data were downloaded and reintegrated to a 10 second epochs using Actilife v6.11.9 software. Then data were screened for non-wear and wear periods using the Choi algorithm, and further processing was conducted on the wear periods, only. Daily and weekly estimates of accumulated time spent per intensity category were derived using the Evenson Children accelerometer count cut-point threshold values, and included sedentary (≤100 counts per minute), light intensity (101 to 2295 counts per minute), moderate (2296 to 4011 counts per minute), and vigorous (≥ 4012 counts per minute) intensity.

Weekly summary averages were computed in participants with valid wear (≥2 week days and ≥1 weekend day with ≥10 hours per day) and used for analyses. Descriptive statistics were conducted on all accelerometer summary estimates (all days, week days, and weekend days), and included the proportion of participants that accumulated sufficient physical activity to meet aerobic Physical Activity Guideline (USDHHS, 2008).

Self-Reported Physical Activity: Self-reported physical activity was assessed with measures from the Physical Activity Questionnaire for Older Children (PAQ-C), a measure with evidence of validity in assessing physical activity in children (Crocker et al., 1997; Kowalski et al., 1997; Janz et al., 2008). For the purposes of this study, the sports/exercise checklist from the PAQ-C was used to estimate leisure-time, moderate- to vigorous- intensity physical activity. This checklist includes 16 common sports/exercise activity types in children. For each activity type, participants recorded the frequency of participation over the past 7 days using the following response options: 0 times, 1-2 times, 3-4 times, 5-6 times and ≥7 times. Activity types were assigned a MET value using the Youth Compendium of Physical Activities (Butte et al., 2017), which was multiplied by the median value of the recorded frequency response (0, 1.5, 3.5, 5.5, and 7.5 times per week). Blank activity types were entered as missing, and recoded as 0 based on the observation that missing information reflects non-participation. Activity specific estimates, expressed as MET/times/wk, were summed across all activities to provide an estimate of leisure-time physical activity (also expressed as MET/hr/wk).

Physical Activity-Related Intrapersonal Factors

In exploring the impact of Marathon Kids on intermediary outcomes related to physical activity engagement, we measured the following five intrapersonal factors:

- *Athletic identity self-concept (e.g., "physical activity is important to me")*
- *PA outcome expectations (e.g., "When I do physical activity, I enjoy it, find it pleasurable, etc.")*
- *PA enjoyment ("How much do you enjoy… running?, walking?, etc.")*
- *Barrier PA self-efficacy (e.g., "How sure are you that you can… be physically active even if you have a lot of homework?"), and*
- *Perceived teacher PA social support (e.g., "I have a teacher or another adult in my school who…wants me to exercise/be physically active, encourages me to do sports or exercise, etc.").*

These intermediary PA outcome factors have strong theoretical foundations for engagement in health behavior based in Social Cognitive Theory and Social Support Theory (Bartholomew et al., 2016). Measures for these factors were adapted from previous studies that provide evidence of association with young people's PA engagement (Brustad, 1993; Saunders et al., 1997; Anderson et al., 2009; Dishman et al., 2009; Klesges et al., 2010).

Appendix C, Table 1 presents as summary of the PA-related intrapersonal factor measures. In exploring the creation of composite variables for each of these factors, we first assessed the internal consistency of scales intended to measure a given construct using the reliability analysis command in IBM SPSS version 25. *Athletic identity self-concept* (7-items, with composite score ranging from 0-21, with 21=highest athletic identity; α = .77), *barrier PA self-efficacy* (5 items, with scores ranging from 0-10, with 10 = highest self-efficacy; α = .75), and *perceived teacher PA social support* (7 items, with scores ranging from 0-28, with 28=highest teacher PA social support; α = .85) were all found to demonstrate good internal consistency based on a previously established criterion of α >.60 (DeVellis, 2004). For the PA outcome expectations scale (n=6 items), internal consistency was improved by removing the "I feel bored" item (α = .55 with reverse scored "feel bored" item), resulting in 5 items (score range: 0-15) and α = .76. For PA enjoyment (n=5 items), scale reliability was improved by removing the "walking" item (α = .56 with "walking" item), resulting in 4 items (score range: 0-8) and improvement in internal consistency (α = .65). Given the important focus on running and walking for this study, we assessed three PA enjoyment outcomes: a.) a composite variable of *PA enjoyment* described here (running, PE class, playing sports, and being physically activity; score range of 0-8, with 8=highest enjoyment); and b) two single item variables of *running* and *walking* (range of 0-2, with 2=highest enjoyment). Lastly, the student questionnaire asked students to report their age, gender, ethnicity, and language spoken at home (see Appendix A).

End-of-Year Marathon Kids Coach/PE Teacher Interview

Lastly, we conducted an end-of-year interview with the MK coach for the intervention schools and the PE teacher from the comparison schools in order to assess implementation of the MK program (intervention schools) and document other physical activity-related programming taking place in the comparison schools. Two interview guides- one for MK Coach (20 questions) and one for PE Teacher for Comparison Schools (13 questions)- were developed with input from MK staff. The MK interview guide comprised closed and open-ended questions related to various facets of delivery of MK, similar to those described below for the Finisher Survey; the PE Teacher interview guide assessed physical activity programming- including engagement in walking and running- in comparison schools (see Appendix B: *End-of-Year MK Coach/PE Teacher Interview Guide*). Interviews were conducted in person by the MK Pilot Study project director during May of 2019 and lasted approximately 30-40 minutes.

Marathon Kids Coach Finisher Survey

Study Aims 2 & 3: Describe the implementation of Marathon Kids in elementary schools and the out-of-school-time setting & Explore the barriers and facilitating factors for implementation of Marathon Kids, including the best practices for program implementation, among coaches.

Study Design & Study Population

The *Marathon Kids Coach Finisher Survey* ("Finisher Survey") is an online survey conducted annually by Marathon Kids staff with Marathon Kids coaches, who are often the PE teacher, classroom teacher, or other community leader. For the Marathon Kids Pilot Study, we were able to collaborate with MK Staff to incorporate additional questions that addressed our study aims listed above. The Finisher Survey was based in a cross-sectional study design in which coaches responded to an online survey at one time point during the end of spring 2019.

Study Measures and Procedures

The Finisher Survey was a self-administered survey delivered via an online platform to all Marathon Kids coaches from across the U.S. who participated in Marathon Kids during the 2018-19 year. For the current study, the Finisher Survey comprised 14 closed and open-ended questions that explored the delivery of the MK program during 2018-2019 (see Appendix D: *Marathon Kids Coach Finisher Survey*). Key study constructs assessed included:

- *Descriptive characteristics:* In describing our sample, we asked coaches to report their *gender* (male/female), their *state* where program is based, and- as a proxy indicator of economic status of the population of the school/club, *Title 1 school status*.

- *Impact & Satisfaction with the MK Program*: Impact on physical activity behaviors was measured with two questions, with one question assessing number of students who completed between one and four marathons, and the other question assessing the number of minutes provided for PA for walking and running for MK during a given week. Perceived satisfaction with the Marathon Kids program was measured by 8 items on a 7-point scale (options ranging from "Not at all true" to "Very True"), with items such as "I enjoyed doing MK very much this year" and "MK helped my runners feel more confident about their ability to engage in physical activity." For the purpose of this study, we created a composite satisfaction score by summing items for this scale, which was found to have high internal consistency ($\alpha = .92$). As an additional measure of satisfaction, we asked coaches if they plan on participating in Marathon Kids again next season.

- *Implementation of Marathon Kids:* Implementation of Marathon Kids was assessed by five implementation domains that asked coach respondents: a.) to indicate the time of day time scheduled for their running clubs; b.) to rate on a 5-point scale the support they received to implement the program (n=5 items, with items such as " "The Coach's Guide provided useful information that benefited me and my run club"; scale reliability $\alpha = .90$); c.) to rate their perceived usefulness of Marathon Kids resources (n=10 items that asked coaches to rate on a 4-point scale how useful resources such as "Running Club Lessons", "Running Tips", "Mileage Logs" and "U.S. Maps" were, with high internal consistency based on $\alpha =$

.87); d.) to indicate how they communicated with parents about MK this year; and e.) to indicate if they implemented any Marathon Kids events during the 2018-19 school year (n=4 items that included "Kick-off event or ceremony" and "Finisher celebration or ceremony").

- *Best Practices, Barriers and Recommendations for Better Support*. Lastly, three open-ended questions asked MK coach respondents to share their: 1.) 3 best practices for implementing MK; 2.) 3 barriers that make it difficult to implement MK in their school; and 3.) 3 ways that MK can better support them with implementing the program.

Marathon Kids Star Coach Interview

Study Aim 3: Explore the barriers and facilitating factors for implementation of Marathon Kids, including the best practices for program implementation, among coaches.

Study Design & Study Population

As a final assessment for the MK Pilot Study, we conducted in-depth interviews with selected high performing MK coaches to explore best practices and recommendations for MK program implementation. Findings from the interviews aim to further inform the MK program model and provide guidance for future MK coaches. The in-depth interviews were based in a qualitative study design. An initial roster of n=8 high performing coaches were provided to our research team by Marathon Kids staff, of which we were able to contact and invite n=6 coaches. Coaches were based in Texas.

Study Measures and Procedures

The Marathon Kids Star Coach Interview guide consisted of 19 questions (n=14 open-ended) (see Appendix E: *Marathon Kids Star Coach Interview Guide*). Questions assessed the following:

- *Time of day and minutes scheduled of running/walking*
- *Overall implementation best practice*
- *Implementation-specific best practices* (e.g., recruitment, communication, scheduling time for walking/running, tracking of miles, positive reinforcement, celebratory events, administration support)
- *Ways to further support coaches*
- *Descriptive characteristics of coaches* (e.g., gender, number of years implementing MK)

The interviews were conducted by two MK Pilot Study research staff by phone during May and June of 2019, and interviews lasted approximately 30-45 minutes each. As a token of appreciation for participation, MK coach participants received a $20 gift card.

Protection of Human Subjects

All study staff underwent protection of human subjects training and received CITI certification as required by the University of Texas Health Science Center at Houston (UTHealth) School of Public Health. In addition, the study aims, methods, data collection protocols and parental and adult consent and student assent procedures were reviewed and approved by the UTHealth Committee for the Protection of Human Subjects IRB. Review and approval for the study were also obtained by participating school districts, and agreements for participation in the study were secured by all participating schools. Participation in the study was completely voluntary and confidential, and no names of schools, students, or coaches will be included in any reports or publications related to the study.

Analysis

Analyses of *Student Questionnaire data* included descriptive statistics, paired t-tests to assess pretest and posttest differences within study condition, and one-way analysis of covariance (ANCOVA) to assess posttest differences in mean psychosocial/intrapersonal outcome variable scores (e.g., athletic identity self-concept, barrier PA self-efficacy) between study conditions while adjusting for gender (total sample analyses), ethnicity and baseline scores (total sample and gender stratified analyses). In addition, descriptive statistics were computed for all *PAQ-C and accelerometer* estimates at each time-point (baseline and post-test) and change from baseline to post-test, stratified by study condition. Accelerometer summary estimates included averaged daily values for all valid days, for all valid week days, and for all valid weekend days. In adjusted ANCOVA analyses of accelerometer, and PAQ-C data, and self-reported intrapersonal outcomes (e.g., athletic identity self-concept), gender, ethnicity, and baseline estimates were included as covariates. For *Marathon Kids Coach Finisher* data analyses, we present descriptive statistics (percentages, means) for impact and implementation-related factors for the total sample of coaches, by geographic region (Texas vs. Other states), and by school economic status (Title 1 vs. Non-Title 1 school). Independent sample t-tests were also run to assess differences in continuous variables; chi-square tests were computed to assess differences in dichotomous variables. Analyses were conducted using SAS 9.4 (Cary, NC) and IBM SPSS v.25 (Chicago, IL) software.

Qualitative analysis of open-ended coach questions from the *Finisher Survey* and the *Marathon Kids Star Coach Interviews* was based on thematic content analysis (Zhang & Wildemuth, 2009) with the overarching aim of identifying key implementation approaches as well as barriers, facilitating factors, and best practices. In conducting the analysis, we first transcribed (for interview-based data) and uploaded open-ended data (Finisher Survey) to NVivo qualitative data analysis software (QSR International Pty Ltd. Version 11). Content analysis was guided by both deductive (drive by the original interview/survey questions) and inductive (allowing for emerging themes) analytic approaches and consisted of attaching a descriptor to qualitative data, grouping into categories, and then developing themes to generate insights about MK program implementation related to the program-related domains described above.

Findings

Matched Comparison-Group Pilot Study

Of the 572 3rd, 4th and 5th grade students from the six study schools invited to participate in the matched comparison-group pilot study, we received n=291 returned consent forms from parents. Of the n=291 who returned consent forms, n=212 provided consent to have their child participate, and of those, n=195 students participated in the baseline survey, representing a 34% overall response rate based on all students invited, and a 67% response rate for parents who returned consent forms. Of the n=195 students who filled out a baseline survey, n=31 were missing a posttest (n=21) or data for more than two-thirds of their pretest (n=10), and were thus excluded from analyses.

Tables 1a and 1b present descriptive characteristics of students participating in the pilot study for the full sample (those who participated in the questionnaire assessment) and the subsample of students who participated in the accelerometer assessment. In the full sample, no statistically significant differences in age (mean age of 9.5 years) or gender were found between intervention and comparison school students, despite higher composition of girls in intervention schools (Table 1a). Intervention school students had a higher composition of Hispanic students (51.2% vs. 34.4%) and lower composition of African American students (19.1% s. 33.3%) compared to comparison school students, respectively (p=.01). A higher percentage of intervention school students also reported speaking Spanish at home (33.8% vs. 12.5%, p=.0001). Lastly, based on school-level data from 2017-18, intervention schools had a higher composition of economically disadvantaged students (82.9%) compared to comparison schools (71.5%) (Table 1a).

Table 1a. Descriptive characteristics of students by intervention (n=3) and comparison schools (n=3) *(Full Sample at baseline). Student Questionnaire- Marathon Kids Pilot Study, Central Texas, 2018-19.*

	Intervention (n=68) (%)	Comparison (n=96) (%)	p-value
Age in year[a] (mean) (range)	9.5 (SD: .82) *(8 - 12 years)*	9.5 (SD: .62) *(8 - 12 years)*	0.874[d]
Gender (%)			
Female	64.2	52.1	0.125[e]
Male	35.8	47.9	
Race/Ethnicity (%)			
African American	19.1	33.3	**0.01**[e]
Hispanic	51.2	34.4	
White	13.2	5.2	
Other[b]	16.2	27.1	
Language Spoken at Home			
English	61.8	66.7	**0.0001**[e]
Spanish	33.8	12.5	
Other	4.4	20.8	
School Econ. Disadvantage[c]	82.9	71.5	N/A

[a]Intervention Grade levels: 3rd-5th; Comparison: 3rd-4th. [b]Other: Includes Asian, Native Am., mixed ethnicities, & "Other"; N/A, data not available. [c]Based on 2017-18 *Campus Profile- Texas Academic Performance Report* for children who qualify for free & reduced lunches. [d]Based on Independent sample t-test. [e]Based on Chi-Square Test. Bold text =statistical significance at p<.05.

For the subsample of students participating in the accelerometer assessment (n=103), with the exception of language spoken at home- in which a greater proportion of intervention school students spoke Spanish at home (p=.02), no statistically significant differences were found between intervention and comparison groups by age, gender or ethnicity (Table 1b). As with the full sample, it is worth noting the higher composition of girls in the intervention condition given gender differences found in U.S. children's physical activity (National Physical Activity Plan Alliance, 2018).

Table 1b. Descriptive characteristics of students by intervention (n=3) and comparison schools (n=3) *(Accelerometer Subsample). Student Questionnaire- Marathon Kids Pilot Study, Central Texas, 2018-19.*

	Intervention (n=53) (%)	Comparison (n=50) (%)	p-value
Age in year[a] *(mean)*	9.5 (SD: .82)	9.5 (SD: .62)	0.86[d]
(range)	*(8 - 12 years)*	*(8 - 12 years)*	
Gender (%)			
Female	64.0	52.7	0.242[e]
Male	36.0	47.3	
Race/Ethnicity (%)			
African American	17.6	29.1	0.141[e]
Hispanic	51.0	41.8	
White	15.7	5.5	
Other[b]	15.7	23.6	
Language Spoken at Home			
English	54.9	63.6	**0.02**[e]
Spanish	39.2	18.2	
Other	5.9	20.8	
School Econ. Disadvantage[c]	82.9	71.5	N/A

[a]Intervention Grade levels: 3rd-5th; Comparison: 3rd-4th. [b]Other: Includes Asian, Native Am., mixed ethnicities, & "Other"/ N/A, data not available. [c]Based on 2017-18 *Campus Profile- Texas Academic Performance Report* for children who qualify for free & reduced lunches. [d]Based on Independent sample t-test. [e]Based on Chi-Square Test. Bold text =statistical significance at p<.05.

Physical Activity Outcomes

Physical Activity (Accelerometer-Assessed)

Table 2 presents unadjusted findings from the accelerometer assessment that examined children's physical activity engagement in intervention (n=3) and comparison schools (n=3) between fall 2018 (November 2018-January 2019) and spring 2019 (March-May). Of the twenty students at each study school initially selected and invited to participate in the accelerometer assessment (see description above for sample selection), our final analytic sample comprised n=53 intervention school students and n=50 comparison school students with valid wear, as described in the methods section. Table 2 presents descriptive statistics for all summary estimates (all valid days, all valid week days, and all valid weekend days), including the proportion of participants meeting aerobic Physical Activity Guidelines at baseline, post-test, and absolute change from baseline to post-test, by study condition. For reporting purposes, we focus in this section specifically on minutes of accumulated moderate-and-vigorous physical activity (MVPA) given the established benefits of MVPA for public health (USDHHS, 2018). Specifically, we focus on *all valid days, weekday,* and *weekend MVPA daily minutes.*

At baseline, students in intervention and comparison schools engaged in similar frequency of moderate-and-vigorous physical activity (MVPA), with an average of 53.7 daily MVPA minutes in intervention schools, and an average of 55.4 minutes of daily MVPA minutes in comparison schools (p=.68) (Table 2). The percentage meeting physical activity guidelines of 60 minutes of daily MVPA was 32.8% and 38.0% of intervention and comparison school students, respectively (p=.53). At posttest, unadjusted analyses indicated borderline significant differences (p=.06) and significant differences (p=.01) between intervention and comparison groups for *all days* MVPA daily minutes and *weekday* MVPA daily minutes, respectively, with higher MVPA minutes found for comparison school students. No significant differences in MVPA by study condition were found for MVPA *weekend* minutes. Furthermore, no significant baseline to posttest change in MVPA minutes were found for the three primary outcomes (*all day MVPA, weekday MVPA, and weekend MVPA*) between intervention and comparison school (Table 2).

In exploring further our findings, we conducted one-way analysis of covariance (ANCOVA) in order to assess changes in MVPA at posttest while adjusting for student gender, ethnicity and baseline MVPA values [data not shown in tables]. Adjustments for gender and ethnicity were made given differences in these demographic factors found by study condition along with evidence of gender differences in children's physical activity (National Physical Activity Plan Alliance, 2018). In conducting the ANCOVA, preliminary analyses evaluating the homogeneity-of-slopes assumption indicated that the relationship between the covariates (gender, ethnicity and baseline) and each of the dependent variables (*all days, weekday* and *weekend MVPA daily minutes*) did not differ significantly as a function of the independent variable (study condition) (p=N/S), indicating that the assumption of homogeneity of slopes was not violated. None of the ANCOVAs, which adjusted for

gender, ethnicity, and baseline MVPA, was found to be significant, indicating no differences between intervention and comparison school students on accelerometer-assessed MVPA (*all days MVPA daily minutes:* F(1, 60) =.762, MSE = 112.497, p = .386; *weekday MVPA daily minutes:* F(1, 60) = 3.482, MSE = 161.833, p=.067; *weekend MVPA daily minutes:* F(1, 60) =.006, MSE = 955.328, p=.936).

Given initial differences in unadjusted findings between intervention and comparison school students at posttest and the non-significant findings with adjustment for gender, ethnicity and baseline, we conducted additional analyses to explore these findings by running unadjusted ANCOVAs for each of the MVPA outcomes and ANCOVAS adjusting for gender and ethnicity independently [data not shown in tables]. Our unadjusted ANCOVAS analyses showed similar findings as presented in Table 2, with no differences between intervention and comparison groups for *all days* MVPA daily minutes (p=.351) and *weekend* MVPA daily minutes (p=.992), but significant differences for *weekday* MVPA daily minutes (p=.038). While ethnicity was found to have no effect on the association between study condition and MVPA outcomes, adjusting for gender resulted in non-significant findings for *weekday* daily MVPA minutes outcome (p=.08), suggesting the important role gender composition has on MVPA outcomes (Note: other MVPA outcomes also maintained non-significance in gender adjusted analyses).

Table 2. Accelerometer-determined physical activity and sedentary behavior in the ***Active Kids Project*** at baseline, post-test, and baseline to post-test change. *Marathon Kids Pilot Study, Central Texas, 2018-19.*

	BASELINE (Fall 2018) **n=103**			**POST-TEST** (Spring 2019) **n=81**			**BASELINE TO POST-TEST CHANGE** **n=69**		
% of Downloaded (Valid / Total Returned)	*103/139 or 74.1%*			*81/136 or 59.6%*					
	Marathon Kids	**Control**	***p* value**	**Marathon Kids**	**Control**	***p* value**	**Marathon Kids**	**Control**	***p* value**
n	53	50		38	43		36	33	
	All Valid Days								
Valid Days, $d \cdot wk^{-1}$	5.0 (1.3)	5.4 (1.4)	0.12	4.6 (1.1)	5.0 (1.3)	0.2	-0.6 (1.4)	-0.6 (1.7)	0.89
Wear Time, $min \cdot d^{-1}$	805.3 (61.5)	826.7 (71.2)	0.11	831.8 (76.3)	859.0 (78.4)	0.12	15.2 (77.6)	15.3 (65.9)	1.0
Average accelerometer counts, $ct \cdot min \cdot d^{-1}$	516.7 (179.8)	515.3 (140.3)	0.97	479.0 (139.9)	519.8 (125.7)	0.17	-9.3 (105.8)	3.7 (84.9)	0.57
Sedentary, $min \cdot d^{-1}$	504.1 (76.3)	526.6 (73.4)	0.13	534.0 (82.1)	540.6 (82.1)	0.72	18.9 (76.1)	8.2 (57.3)	0.51
Light intensity, $min \cdot d^{-1}$	247.5 (43.6)	244.7 (39.1)	0.73	246.9 (43.4)	260.0 (46.5)	0.19	-4.1 (44.3)	5.0 (43.1)	0.39
Moderate intensity, $min \cdot d^{-1}$	33.5 (11.6)	34.6 (10.0)	0.61	32.8 (10.9)	37.7 (10.2)	**0.04**	0.7 (8.8)	1.6 (6.9)	0.63
Vigorous intensity, $min \cdot d^{-1}$	20.2 (11.8)	20.8 (10.3)	0.79	18.1 (8.6)	20.6 (8.5)	0.18	-0.3 (6.3)	0.4 (4.5)	0.56
MVPA (accumulated), $min \cdot d^{-1}$	53.7	55.4	0.68	50.9	58.3	*0.06*	0.4	2.1	0.57

	(22.3)	(19.0)		(18.5)	(16.9)		(14.2)	(10.0)	
MVPA (in bouts), min·d^{-1}	12.3 (14.0)	15.3 (16.1)	0.31	10.5 (13.4)	13.3 (11.0)	0.31	0.9 (12.1)	0.9 (7.8)	1.0
Meets Physical Activity Guidelines, %	32.1	38.0	0.53	29.0	41.9	0.23	---	---	---
	Week Days								
Wear Time, min·d^{-1}	799.8 (66.1)	823.8 (75.5)	0.09	813.9 (81.8)	842.4 (83.3)	0.13	2.7 (83.6)	6.6 (63.2)	0.82
Average accelerometer counts, ct·min·d^{-1}	513.1 (190.2)	511.4 (146.0)	0.96	456.0 (138.3)	513.3 (123.1)	*0.06*	-33.7 (142.1)	1.0 (86.0)	0.22
Sedentary, min·d^{-1}	502.9 (83.5)	526.3 (81.0)	0.15	528.8 (86.4)	529.4 (84.5)	0.97	14.5 (87.1)	2.5 (57.8)	0.50
Light intensity, min·d^{-1}	243.9 (43.7)	243.3 (42.6)	0.95	238.7 (42.4)	257.0 (44.0)	*0.06*	-8.0 (46.1)	2.7 (38.9)	0.30
Moderate intensity, min·d^{-1}	32.9 (11.3)	33.6 (10.6)	0.73	30.4 (9.3)	36.2 (9.6)	**0.01**	-1.2 (9.0)	1.4 (6.1)	0.16
Vigorous intensity, min·d^{-1}	20.1 (12.7)	20.7 (11.0)	0.81	16.0 (7.9)	19.7 (8.2)	**0.04**	-2.7 (9.6)	-0.07 (6.0)	0.18
MVPA (accumulated), min·d^{-1}	53.0 (22.9)	54.3 (20.1)	0.76	46.4 (16.4)	55.9 (16.3)	**0.01**	-3.9 (17.3)	1.4 (10.9)	0.14
	Weekend Days								
Wear Time, min·d^{-1}	823.4 (85.9)	834.5 (126.6)	0.6	863.1 (107.5)	896.8 (127.8)	0.2	29.8 (128.3)	37.6 (153.4)	0.82
Average accelerometer counts, ct·min·d^{-1}	516.6 (207.8)	520.7 (180.1)	0.92	529.0 (209.7)	553.3 (232.4)	0.62	45.5 (222.5)	30.2 (209.8)	0.77
Sedentary, min·d^{-1}	510.1 (90.1)	529.4 (104.7)	0.32	540.0 (102.1)	564.0 (124.3)	0.34	22.1 (107.7)	17.0 (121.4)	0.86

Light intensity, min·d^{-1}	258.4 (62.5)	247.7 (55.5)	0.36	262.5 (54.4)	267.8 (63.5)	0.7	-1.7 (79.0)	14.3 (68.5)	0.37
Moderate intensity, min·d^{-1}	34.8 (16.9)	36.6 (13.3)	0.54	38.1 (18.2)	41.3 (16.5)	0.4	4.7 (21.0)	3.4 (16.4)	0.78
Vigorous intensity, min·d^{-1}	20.1 (13.1)	20.9 (12.0)	0.77	22.6 (15.1)	23.6 (15.1)	0.76	4.8 (16.1)	2.8 (15.6)	0.60
MVPA, min·d^{-1}	54.9 (28.5)	57.5 (24.0)	0.62	60.6 (31.8)	64.9 (29.2)	0.53	9.5 (35.8)	6.2 (29.2)	0.68

MVPA = moderate to vigorous intensity physical activity; Evenson count cut-point set used to define intensity categories; valid wear: ≥2 week days and ≥1 weekend day with ≥10 hours per day; change estimates calculated as post-test value minus baseline value.

Italicized p values = <0.10; **Bold** p values = p <0.05

Physical Activity Outcomes (PAQ-C/Self-Report)

In addition to assessing differences in physical activity using accelerometry, we also examined leisure-time physical activity differences using the Physical Activity Questionnaire for Older Children (PAQ-C), a self-reported measure of physical activity with evidence of validity in measuring children's physical activity (Crocker et al., 1997; Kowalski et al., 1997; Janz et al., 2008). Table 3 presents the mean PAQ-C scores for students attending Marathon Kids and comparison schools at baseline, posttest, and baseline to posttest change (unadjusted). As presented in Table 3, no differences in the unadjusted analyses were found between groups at baseline, post-test, or baseline to posttest change.

In exploring further possible differences between intervention and comparison school students in PAQ-C scores, we also ran additional analyses using ANCOVA in order to adjust for student gender, ethnicity as well as baseline values [data not shown in tables]. A preliminary analysis evaluating the homogeneity-of-slopes assumption indicated that the covariates (gender, ethnicity and baseline values) and the dependent variable (PAQ-C scores) did not differ significantly as a function of the independent variable (intervention study condition) (p=.379), indicating that the homogeneity assumption was not violated. As with our unadjusted findings presented in Table 3, results from the ANCOVA were non-significant, $F(1,157) = .077$, MSE=13317.200, p=.78, indicating no significant difference in PAQ-C scores at posttest between students in Marathon Kids and comparison schools.

Table 3. Reported leisure-time physical activity in the ***Active Kids Project*** at baseline, post-test, and baseline to post-test change.

Marathon Kids Pilot Study, Central Texas, 2018-19.

	BASELINE n=184			**POST-TEST n=173**			**BASELINE TO POST-TEST CHANGE n=169**		
	Marathon Kids	**Control**	***p* value**	**Marathon Kids**	**Control**	***p* value**	**Marathon Kids**	**Control**	***p* value**
n	73	111		72	101		67	96	
Reported Leisure-time Physical Activity MET·times·wk^{-1}	206.9 (126.9)	198.5 (121.9)	0.66	217.1 (120.5)	220.8 (129.4)	0.85	15.6 (149.0)	16.2 (139.5)	0.98

Italicized p values = <0.10; **Bold** p values = p <0.05

Physical Activity-Related Intrapersonal Outcomes

Tables 4a and 4b present physical activity-related intrapersonal outcomes, which include *athletic identity self-concept, positive outcome expectations (attitudes) for physical activity, perceived enjoyment of physical activity, perceived running enjoyment, perceived walking enjoyment, barrier PA self-efficacy* (i.e. self efficacy to engage in PA despite barriers such as homework), and *perceived teacher PA social support.* No differences in intrapersonal PA outcomes for the total sample (Table 4a) or for the gender-specific groups (Table 4b) were found between pretest and posttest for the intervention or control groups or for the ANCOVA analyses comparing intervention and comparison group.

Table 4a. Physical activity intrapersonal-related outcomes by study condition at pretest and posttest **(Total Sample)** - 3rd-5th grade students. *Student Questionnaire - Marathon Kids Pilot Study, Central Texas,* 2018-19.

	Intervention (n=68)					*Comparison (n=96)*					*ANCOVA (Between Group - Posttest)* [c]				
	Pretest[a]		Posttest[a]			Pretest[a]		Posttest[a]			Intervention		Comparison		
	Mean[b]	(SD)	Mean[b]	(SD)	*p-value*	Mean[b]	(SD)	Mean[b]	(SD)	*p-value*	Adj. Mean[c]	(SE)	Adj. Mean[c]	(SE)	*p-value*
Athletic Id. Self-Concept[d]	15.96	(3.88)	15.84	(3.68)	*0.766*	15.63	(3.98)	15.44	(4.15)	*0.603*	15.66	(.393)	15.59	(.317)	*0.885*
PA Outcome Expectations[e]	11.80	(3.12)	11.85	(3.11)	*0.901*	11.33	(3.22)	11.10	(3.46)	*0.439*	11.71	(.343)	11.25	(.290)	*0.313*
Perc'd. PA Enjoyment[f]	6.82	(1.40)	6.48	(1.75)	*0.180*	6.27	(1.95)	6.19	(2.11)	*0.564*	6.27	(.193)	6.34	(.159)	*0.789*
Perc'd. Running Enjoyment[g]	1.60	(0.53)	1.46	(0.64)	*0.083*	1.53	(.674)	1.42	(.653)	*0.077*	1.45	(.070)	1.44	(.058)	*0.909*
Perc'd. Walking Enjoyment[g]	1.59	(.59)	1.59	(0.59)	*1.000*	1.45	(.643)	1.56	(.623)	*0.132*	1.56	(.072)	1.59	(.061)	*0.787*
Barrier PA Self-Efficacy[h]	6.20	(2.58)	6.42	(2.91)	*0.556*	5.45	(2.79)	5.51	(3.10)	*0.808*	6.15	(.322)	5.75	(.273)	*0.350*
Teacher PA Support[i]	17.67	(6.40)	17.63	(7.19)	*0.972*	18.75	(6.39)	19.66	(7.26)	*0.252*	17.80	(0.922)	19.62	(0.740)	*0.128*

Abbreviations: *Athletic Id., Athletic Identity; PA, Physical Activity; Perc'd, Perceived; Adj., Adjusted; SD, Standard Deviation; SE, Standard Error.* Statistical significance set at p<.05.

[a]Pretest: November 2018-January 2019; Posttest: March-May 2019. [b]Based on paired t-test (no adjustment). [c]Based on ANCOVA with adjustment for gender, ethnicity and pretest value.

[d]*Athletic Identity self-concept* scale ranges from 0-21 (21 = highest self concept). [e]PA Outcome expectations ranges from 0-15 (15 = highest/positive expectations)

[f] *Perceived PA Enjoyment (running, PE class, playing sports, being active)* ranges from 0-8 (8 = highest enjoyment). [g]Perc'd running & perc'd walking enjoyment: single item variables ranging from 0-2 (2=highest enjoyment)

[h]Barrier PA Self-Efficacy scale ranges from 0-10 (10 = highest PA self-efficacy). [i]Teacher PA Support ranges from 0-28 (28=highest support).

Table 4b. Physical activity intrapersonal-related outcomes by study condition at pretest and posttest **(Girls & Boys)** - 3rd-5th grade students. *Student Questionnaire - Marathon Kids Pilot Study, Central Texas,* 2018-19.

	Girls					*Boys*				
	ANCOVA (Between Group - Posttest [ab])					*ANCOVA (Between Group - Posttest [ab])*				
	Intervention (n=43)		Comparison (n=50)			Intervention (=24)		Comparison (n=46)		
	Adj. Mean[b]	(SE)	Adj. Mean[b]	(SE)	*p-value*	Adj. Mean[b]	(SE)	Adj. Mean[b]	(SE)	*p-value*
Athletic Id. Self-Concept[c]	15.79	(.534)	15.76	(.476)	*0.974*	15.56	(.593)	15.36	(.417)	*0.782*
PA Outcome Expectations[d]	11.70	(.402)	11.55	(.369)	*0.786*	11.78	(.618)	10.87	(.470)	*0.246*
Perc'd. PA Enjoyment[e]	6.18	(.239)	6.04	(.224)	*0.672*	6.27	(.317)	6.71	(.222)	*0.264*
Perc'd. Running Enjoyment[f]	1.44	(.087)	1.35	(.081)	*0.438*	1.43	(.118)	1.54	(.084)	*0.482*
Perc'd. Walking Enjoyment[f]	1.67	(.073)	1.73	(.068)	*0.526*	1.45	(.145)	1.40	(.107)	*0.772*
Barrier PA Self-Efficacy[g]	6.35	(.401)	5.64	(.391)	*0.215*	5.86	(.550)	5.82	(.386)	*0.950*
Teacher PA Support[h]	19.22	(.940)	20.57	(.857)	*0.301*	15.87	(1.109)	18.34	(1.252)	*0.288*

Abbreviations: *Athletic Id., Athletic Identity; PA, Physical Activity; Perc'd, Perceived; Adj., Adjusted; SD, Standard Deviation; SE, Standard Error.* Statistical significance set at p<.05.

[a]Pretest: November 2018-January 2019; Posttest: March-May 2019. [b]Based on ANCOVA with adjustment for gender, ethnicity and pretest value.

[c]*Athletic Identity self-concept* scale ranges from 0-21 (21 = highest self concept). [d]PA Outcome expectations ranges from 0-15 (15 = highest/positive expectations)

[e] *Perceived PA Enjoyment (running, PE class, playing sports, being active)* ranges from 0-8 (8 = highest enjoyment). [f]Perc'd running & perc'd walking enjoyment: single item variables ranging from 0-2 (2=highest enjoyment).

[g]Barrier PA Self-Efficacy scale ranges from 0-10 (10 = highest PA self-efficacy). [h]Teacher PA Support ranges from 0-28 (28=highest support).

Marathons Completed and Satisfaction with Marathon Kids

Lastly, as a measure of process as well as program-related impact, we asked students in the Marathon Kids schools to share both the number of marathons they completed as well as their satisfaction with the Marathon Kids program. As shown in Table 5, 85.1% of students completed one or more marathons during the year, with 62.6 completing two or more. While no significant differences were found in completion rates by gender, a higher percentage of boys (30.4%) reported completing four marathons compared to girls (9.3%). Students were also positive with their ratings of different facets of Marathon kids, with an average rating of "3" out of "4", with 4 being the highest rating. No gender differences in rating of Marathon Kids were found.

Table 5. Process-related Measures for Marathon Kids Participants (posttest only) - total sample and by gender - 3rd-5th grade students. *Marathon Kids Pilot Study, Central Texas,* 2018-19.

	Total Intervention (n=68) %	*Girls* Intervention (n=43) %	*Boys* Intervention (n=23) %	*Gender: p-value* [b,c]
Completed Marathon Kids Mileage Log?				
No, didn't complete	14.9	16.3	13.0	*0.235* [b]
Yes, completed 1 marathon	22.4	20.9	21.7	
Yes, completed 2 marathons	32.8	39.5	21.7	
Yes, completed 3 marathons	13.4	14.0	13.0	
Yes, completed 4 marathons	16.4	9.3	30.4	
What do you think about Marathon Kids? [a]				
I enjoy Marathon Kids *(mean score, 1-4)* [a]	2.9	2.7	3.1	*0.189* [c]
I would like to do Marathon Kids next year	2.8	2.6	3.2	*0.109*
I would recommend MK to other kids	2.8	2.7	3.0	*0.409*

Questions administered at Posttest: March-May 2019.

[a]Based on likert scale response with 0=not at all, 1=Not that much, 2=In between, 3=Yes a little, 4= yes a lot.

[b]Based on chi-square test; [c]Based on independent sample t-test.

"I like that you can run with friends and make new friends." –Marathon Kids elementary school student, Central Texas

Related to satisfaction, we also asked students attending Marathon Kids study schools to share what they most liked about Marathon Kids using an open ended question format. Table 6 presents a summary of quotes from students, which are organized around two major themes: *Opportunity to run/Exercise* ("I can run and I love to run"); and *Specific things students like about Marathon Kids*, which included general like for Marathon Kids and perceptions of *fun* ("I like it"; "That I can be active and also have lots of fun"), *positive impact on friendship* ("I like that you can run with friends and make new friends"), *the tracking aspect* ("Tracking my progress and see it grow"), and *the prizes provided through Marathon Kids* ("I like that when you finish you get a prize") (Table 6).

Table 6. Open-Ended Question: "Please write what you like most about Marathon Kids." (total sample and by gender) - 3rd-5th grade students. *Marathon Kids Pilot Study, Central Texas,* 2018-19.

Opportunity to run/Exercise
"Anyone is invited and you can run when it's not WOW time."
"Because you can be fast"/ "Because you get to run"/"Doing track"
"Exercise"/"Exercising"
"I can run and I love to run." "I like running"/ I like running (X2)
"I love to run and exercise"/ "I love walking and running"
"I run a lot"/ "Running"/ "Running and walking"
"Running, walking, exercising". / "Running, walking, exercising and having fun outside!"
"Runnning two laps or more."/ "The running"/ "Walking and running."
"We are active when we run."/ "We run a lot, it helps a lot, and it's good for your health"
Specific things students like about Marathon Kids
"I like it" (X2)/ "I like all the running prizes"/
"I like that when you finish you get a prize"/ "Running and getting prizes"
"You get good stuff from the PE teacher"
"I like that you can run with friends and make new friends"/ "You get to run with your friends."
"I think Marathon Kids helps you to be active and it's helpful."
"It can be fun and cool and exercising at the same time."
"It gives you a time to run, walk, or jog during school. You get a time to exercise at whatever time you want"
"Marathon Kids is fun."
"Tracking my progress and see it grow."
"That I can be active and also have lots of fun."
"When we did laps on the track."

Process Evaluation

In an effort to assess both implementation of the Marathon Kids program in our intervention study schools as well as compare physical activity-related support provided between the intervention and comparison schools, we conducted an end-of-year interview with the lead MK coaches from the intervention schools and with the PE teachers from the comparison schools. The following section provides a description of the *delivery* of Marathon Kids in the intervention schools as well as a *comparison of physical activity supports* between the intervention and comparison schools, an exploration of *perceived support* received by MK coaches to implement the program, and exploration of *best practices, barriers for implementation,* and *MK coach recommendations*.

Delivery of Marathon Kids and Physical Activity-Related Support between Intervention & Comparison Schools

Descriptive characteristics between study condition schools. Among our MK coach/PE teacher participants, all three intervention school coaches were female; one of three PE teachers were female among the comparison schools. With regard to experience, we found comparison school teachers had a higher average number of years of experience compared to intervention school teachers (mean of 13 years vs. 9 years, respectively).

Walking & Running Time Provided. Intervention schools participating in this pilot study are part of a school district that supports district-wide implementation of the Marathon Kids program. As part of this model, students may engage in walking and running during the school day as facilitated by their classroom teacher as well as their PE teacher. As noted in Table 7, MK coaches from the intervention schools indicated different times throughout the school day walking/running is provided. Two of the three intervention school indicated they provided time for walking/running before the school day begins; only one of the intervention schools indicated that time is provided during class time for walking/running, but did not indicate how much time. Recess and PE class were popular times of the day for providing walking/running time for two of the three intervention schools, with one of the intervention schools also indicating that they provided walking/running during "WOW" time, a structured physical activity time (see Table 7).

We also asked comparison schools to share how much time they provide for walking/running (Table 7). Similar to intervention schools, comparison schools identified PE and recess time as popular times for providing walking/running time, with one of the schools also indicating a before school walking/running time. In comparing total minutes provided for walking and running, intervention schools indicated between 193.3-200 weekly minutes compared to 291.7 – 345 weekly minutes cited by comparison schools. These numbers should be interpreted with caution as minutes may be under-reported for intervention schools (e.g., one school did not indicate how many minutes are provided during class; others did not indicate whether time was provided during WOW time); comparison schools may also have interpreted this question as 'the opportunity' to walk/run versus providing 'structured time' for walking/running.

Table 7. Mean number of minutes of walking/running provided during a typical week.
End-of-Year Interview - Marathon Kids Pilot Study, Spring 2019.

	Marathon Kids Schools				*Comparison Schools*			
	Total mean mins. per school	School A mins.	School B mins.	School C mins.	Total mean mins. per school	School A mins.	School B mins.	School C mins.
Mean TOTAL weekly minutes of walking/running	193.3 - 200	50-70	430	100	291.7 - 345	385	220-380	270
Mean weekly minutes of walking/running by time of day [b]:								
First thing in morning, before classes begin.		N/A	100	100		165	N/A	N/A
During class time		N/A	N/A	N/A		N/A	100	N/A
During recess time		30	150	N/A		100	100-150	100
During PE class		20-40	40	N/A		120	0-100	110
During lunch time		N/A	N/A	N/A		N/A	N/A	N/A
After school as 'stand alone' MK club		N/A	N/A	N/A		N/A	N/A	N/A
After school as an MK club within existing afterschool program		N/A	40	N/A		N/A	N/A	60
"Other"[c] (Wow time)		N/A	100	N/A		N/A	20-30	N/A

Abbreviations: mins., minutes.

[a]Daily minutes calculated by dividing total weekly minutes by 5 days.

[b]Mean value based on clubs that scheduled time for walking/running during a given time period of day (all clubs reporting "0" were excluded from calculation).

[c]"Other" may include WOW time, a structured time for physical activity engagement.

Tracking of Miles Walked/Run. In exploring the delivery of Marathon Kids, we also assessed how MK coaches help students track their miles, a key facet of the MK program, as well as whether comparison schools also encouraged tracking of miles walked/run during the school year (Tables 8 & 9). With regard to Marathon Kids schools, we found that all three schools used paper mileage logs, with two of the three intervention study schools encouraging students to track on an individual basis, and two tracking as a group with setting a distance goal (Table 8). None of the intervention schools used digital tracking. We also found that only one of the three intervention schools displayed mileage logs in classrooms and in other public spaces such as the hallway. Importantly, we also found that comparison schools also implemented some form of tracking of miles. Two of the comparison schools indicated tracking as a group, and one indicated tracking on an individual basis (Table 8).

Lastly, we found that two of the three intervention schools helped students track miles via their classroom, one provided tracking during PE class, one provided tracking in an afterschool setting, and one encouraged tracking of miles walked/run at home (Table 9). Of note, all three of the comparison schools indicated some form of tracking miles walked/run during PE class (Table 9).

Table 8. Support of Student Tracking of Miles Walker/Run. *End-of-Year Interview - Marathon Kids Pilot Study, Spring 2019.*

	Marathon Kids Schools				*Comparison Schools*			
	Total (n of school)	School A Yes/No	School B Yes/No	School C Yes/No	Total (n of schools)	School A Yes/No	School B Yes/No	School C Yes/No
How do students track miles walked/run? *(Check all that apply)* *Students track their miles…*								
a. …on an individual basis	2	N	Y	Y	1	Y	N	N
b. …as a group by setting one distance goal per run club session.	2	Y	N	Y	2	Y	N	Y
c. …as a group by pooling their cumulative miles together.	0	N	N	N	1	N	N	Y
d. Students use paper mileage logs.	3	Y	Y	Y	0	N	N	N
e. I use digital tracking to track student's mileage and progress.	0	N	N	N	0	N	N	N
f. Mileage logs are displayed in classrooms.	1	N	N	Y	0	N	N	N
g. Mileage logs are displayed in halls or other public areas of the school.	1	N	N	Y	0	N	N	N
Other:	1	N	N	Y	1	Y	N	N

Table 9. Where students track miles. *End-of-Year Interview - Marathon Kids Pilot Study, Spring 2019.*

	Marathon Kids Schools				*Comparison Schools*			
	Total (n of school)	School A Yes	School B Yes	School C Yes	Total (n of schools)	School A Yes	School B Yes	School C Yes
This year, did your 3rd-5th grade students track their miles walked or run in any of the following settings…?								
a. In their PE class?	1	Y	N	N	3	Y	Y	Y
b. In their classroom with their classroom teacher?	2	Y	N	Y	0	N	N	N
c. In art or music class?	0	N	N	N	1	Y	N	N
d. In an afterschool program or club?	1	N	Y	N	0	N	N	N
e. In a before school program or club?	0	N	N	N	0	N	N	N
f. At home?	1	N	Y	N	0	N	N	N

Other School-Based Physical Activity Opportunities. We also explored other opportunities provided in the intervention and comparison study schools for the promotion of children's physical activity. Table 10 presents different opportunities for physical activity provided during the school week, including PE class, recess, WOW time or other structured physical activity time, classroom activity breaks, and before, after school and weekend physical activity. While school study conditions were generally comparable as relates to PA opportunities provided, some differences are worth noting. Comparison schools, for example, provided an average of 55 minutes of PE class per class compared with 45 minutes for intervention schools. Intervention schools provided an average of 30 minutes of recess per session compared to 20 minutes provided in comparison schools, with the same number of sessions (n=5) during week for both intervention and comparisons schools. While only one intervention school indicated that their school engages in classroom activity breaks, all three of the comparison schools indicated engagement in this physical activity opportunity. All three intervention schools indicated providing time before school for physical activity; none of the comparison schools indicated this time of day. Lastly, one of the intervention schools indicated providing physical activity afterschool compared to two of the comparison schools, and two of the intervention schools indicated providing weekend PA opportunities compared to none of the comparison schools (Table 10).

School-based Physical Activity Events: We also explored the provision of physical activity-related events in both intervention and comparison schools, as a *kick-off* and *final mile run/finisher event* have been important facets of the MK program. With regard to the provision of a kick-off event to promote physical activity, three of the MK intervention schools versus one of the comparison schools indicated providing this event (Table 11). Of note, only one of the three MK intervention schools held a *Finisher event* compared with one of the comparison schools. Two of the intervention schools provided a *Field Day* or similar event, compared with three of the comparison schools. Lastly, all intervention and comparison schools indicated inviting parents to attend physical activity-related events (Table 11).

Table 10. Other School-Based Physical Activity. *End-of-Year Interview - Marathon Kids Pilot Study, Spring 2019.*

	Marathon Kids Schools Total (n=3 schools)			*Comparison Schools* Total (n=3 schools)		
	Yes (n of schools)	Times per week	Mean Mins/Time	Yes (n of schools)	Times per week	Mean Mins/Time
Does your school provide….						
a. …PE class?	3	2	45	3	2 to 3	55
b. Recess (outside of lunch)?	3	5	30	2	5	20
c. Recess (during lunch)?	*	*	*	*	*	*
d. WOW Time or other structured PA time	2	*	*	*	*	*
e. Classroom Activity Breaks?	1	1	10	3	3	15
f. Before school PA?	3	5	10	*	*	*
g. After school PA?	1	1	90	2	2	45
h. Weekend PA?	2	5	67.5	*	*	*
i. Other PA?	1	5	45	*	*	*

*Does not provide.

Table 11. Physical Activity Events. *End-of-Year Interview - Marathon Kids Pilot Study, Spring 2019.*

	Marathon Kids Schools				*Comparison Schools*			
	Total (n of school)	School A Yes/No	School B Yes/No	School C Yes/No	Total (n of schools)	School A Yes/No	School B Yes/No	School C Yes/No
Did you implement any of the following events this year?								
a. Kick-off Event or ceremony at start of season?	3	Y	Y	Y	2	Y	Y	N
b. Finisher celebration or ceremony to close out the season	1	N	Y	N	1	Y	N	N
c. Another event that promotes PA such as Field Day?	2	Y	Y	N	3	Y	Y	Y
d. Were parents invited to attend any of the events?	3	Y	Y	Y	3	Y	Y	Y

Marathon Kids-Related Support, Communication with Parents & Satisfaction with Program

In further identifying ways to enhance delivery of the program, we also explored the support received by MK coaches in our intervention study schools to implement the Marathon Kids program-including their perceived usefulness of MK resources, their approaches for communicating with parents about the program, and their overall satisfaction with the program.

Perceived Support. Table 12 below presents mean scores related to various facets of satisfaction with the support received for the program on a scale of 1 to 5, with 1=low satisfaction and 5= high satisfaction. MK coaches provided generally positive ratings on facets of support that include overall support for implementing MK, their confidence in implementing the program, and ease of navigation of the MK website. While still positive overall, lower scores were reported for the Coach's Guide, support received by the coach's school administration, and the impact of the Nike rewards on motivating their runners. Of note, some coaches indicated that they did not know MK website resources were available-with all three coaches indicating they did not access resources on the MK website, that it was hard to disseminate information to classroom teachers, and that Marathon Kids should consider changing the colors or design of the Nike prize shirts in order to provide further motivation for students as students had won the same shirt the previous year. Other open-ended feedback is provided in Box B.

Box B. Marathon Kids Support: Open-Ended Input from Marathon Kids Coaches – End-of-Year Interview, 2019

Support from MK Staff & Administration

- "MK Check-In for support and feedback would be useful"
- "Support at beginning of year, [but] no follow-up visits."
- "Principal who is on board to enforce MK in classrooms is needed."

Events

- "Kick-off as a District has a lot of motivation – no longer available. [Virtual Kick-off?]"
- "Provide resources, but big events are helpful."

Resource Support

- MK Coach's Guide: "Provide a hard copy/MK-specific app. (Only digital copy available.)"
- Coach's Club: "Did not know it was available."
- Rewards: Consider: "T-shirt, collaborative 'surprise box', squishy toys, wristbands."
- "Like t-shirts, shoelaces…medal".

Table 12. Support Received for Implementation of Marathon Kids.
End-of-Year Interview - Marathon Kids Pilot Study, Spring 2019. (Marathon Kids Schools Only)

Please indicate how much you agree or disagree with following statements… [a]	Total Mean Score	School A Score	School B Score	School C Score
a. MK Welcome Packet received in mail is useful.	3.66	3	5	3
b. Coach's Guide provided useful information that benefitted me/my run club.	3.5	3	N/A	4
c. I feel sufficiently support by MK to implement program.	4.33	4	5	4
d. I feel sufficiently supported by my school district to implement program.	4.33	3	5	5
e. I feel sufficiently supported by my school administration/leadership.	3.66	2	5	4
f. How confident about your ability to implement MK?	4.33	4	5	4
g. The online Coach's Club was easy to navigate on MK website.	4.00	N/A	N/A	4
h. The Nike rewards motivated my runners to reach their marathon milestones	3.66	2	5.00	4
Other comments:				
did not know MK website resources were available				
hard to dissemniate info to classroom teachers				
change colors/design of Nike prize shirts				

[a] Mean score based on a 5-point Likert-type scale of 1 (Strongly disagree) to 5 (strongly agree).

Perceived Usefulness of Marathon Kids Resources. Table 13 presents mean scores on perceived usefulness of various Marathon Kids Club resources, including Running Club Lessons, Running Tips, Running Games, and tracking-related materials, with 1=lowest perceived usefulness and 4= highest perceived usefulness. While resources that had the highest perceived usefulness were the Group Tracking posters and the Spanish resources, two of the three coaches indicated they did not use the group tracking posters. Other resources that were perceived very useful included the Running Tips and the Running Games; while the Running Club lessons were also perceived useful, two of the three MK coaches did not use these lessons. Of note, the Mileage Logs received average usefulness score (2.7 out of 4), as did the Mileage Certificate (2.5 out of 4). With regard to tracking, coaches shared:

- "Digital tracking would be useful for coaches and students."
- "Coaches do not like Mileage Logs - confusing for kids. Provide 'pie chart' instead."
- "Spreadsheet that enforces accountability for classroom teachers to implement Marathon Kids in classrooms."

Table 13. Perceived usefulness of Marathon Kids Club resources. *Finisher Survey - Marathon Kids Pilot Study, Spring 2019.*

How useful were the following MK Club resources?	Didn't Know About (n)	Didn't Use (n)	Total Mean Score (1-4)
a. Running Club Lessons		2	3.00
b. Running Tips			3.66
c. Running Games			3.66
d. Mileage Logs			2.66
e. Mileage Certificate		1	2.50
f. Kids Pledge/Bib	2	1	
g. Fuel Logs	2	1	
h. Group Tracking Poster (US Map)		2	4.00
i. Group Tracking Poster (Hall of Fame Track)		2	4.00
j. Spanish Resources			4.00
What additional resources would you like to see in Spanish?			
Parent communication, any documents shared with kids			
Please share thoughts on additional resources you would like to see Marathon Kids provide in the future or ways we can improve existing resources:			
digital tracking for kids and coaches as students often lose their paper handouts			

[a]Mean score of a 4-point Likert-type scale of 1 (not at all useful) to 4 (very useful).

Communication with Parents about Marathon Kids Program. Of our three intervention schools, one communicated with parents at their kick-off event, while the other two coaches distributed information about Marathon Kid via their students or directly to parents via a reminder notice, letter or email (Table 14). None of the coaches provided information to parents via newsletters or at a parent meeting. Other ways coaches communicated with parents included phone calls and weekly fitness assemblies.

Table 14. Communication with Parents about Marathon Kids.
End-of-Year Interview- Marathon Kids Pilot Study, Spring 2019. (Marathon Kids Only Schools)

Did you communicate any of the following ways to parents about MK this year? Check all that apply.	Total (n of "yes" schools)
a. PE and/or classroom teachers distributed MK info to students. Students brougth MK info home.	3
b. MK info was distrtibuted directly to parents	1
c. A flyer, letter or email was sent directly to parents.	1
d. Parents were informed about MK at a meeting.	
e. Parents were informed about MK via newsletter	
f. Parents were sent a reminder notive, letter, email about MK during program.	3
g. Other Approaches: *Kick-off Events, Thursday Fitness Assemblies, Phone Calls.*	3

Satisfaction with Marathon Kids and Perceived Impact. MK Coaches reported overall high satisfaction with the Marathon Kids program based on a composite satisfaction score, which included items such as "I enjoyed doing MK very much this year", "I would recommend MK to friend or colleague', and "MK helped my runners feel more confident about their ability to engage in physical activity." (Table 15). Total satisfaction score ranged from 5.5 to 6.25, with a total mean score of 5.9 on a scale of 1 (lowest satisfaction) to 7 (highest satisfaction) (Table 15). Scores were generally high across items. As an indicator of satisfaction with the program, all three MK coaches indicated their intentions to do MK again next year, when it will be optional for teachers in this school district to implement the program.

Table 15. Satisfaction with Marathon Kids and Perceived Impact *(MK Schools Only)* . *End-of-Year Interview - Marathon Kids Pilot Study, Spring 2019.*

	School A Score	School B Score	School C Score
I plan on doing MK again next season (n of schools Yes).	Yes	Yes	Yes
Total mean MK satisfaction score[a]	5.5	6.25	6
a. I enjoyed doing MK very much this year[b].	5	6	7
b. I would recommend MK to friend/colleague[b]	7	7	7
c. MK helped my runners reach daily goal of 60 min MVPA[b]	5	7	6
d. MK helped my runners feel more confident about ability to engage in PA[b]	6	5	5
e. Logging their miles and seeing progress helpd my runners stay engaged and motivated to reach their marathon goal.[b]	4	6	7
f. By the end of the season, I saw improved communication and social skills in kids who participated in program.[b]	5	5	4
g. Our runners enjoyed participants in MK this year.[b]	5	7	6
h. MK is considered an important part of our coordinated school health plan.[b]	7	7	6

Abbreviations: MK, Marathon Kids.

[a]Composite variable based on summary of items a-h and a Likert-type response scale of 1 (not at all true) to 7 (very true), with range of 1 (low satisfaction) to 7 (high satisfaction).

[b]Single item variable, with 1 (not at all true) and 7 (very true).

Best Practices, Barriers and Recommendations for Support in Implementing Marathon Kids

Lastly, we asked MK coaches from our three intervention schools to share their best practices for implementing Marathon Kids, their barriers for implementation, and their recommendations for ways that MK coaches could be further supported with program implementation (Table 16).

Best Practices*:* Three overarching best practice themes that emerged related to the *overall approach for implementing, teacher involvement,* and *the importance of a school physical activity culture* (Table 16). With regard to the approach for implementing the program, MK coaches underscored the importance of providing time for students to walk and run, with PE class time identified as an important setting for providing walking/running time. MK coaches also underscored the importance of providing both running time as well as incorporation of running-type activities such as tag games. Other best practices included: providing reminders about Marathon Kids in assemblies- which may be helpful also for classroom teacher involvement; engaging students in tracking of their miles- as well as providing visuals in hallways related to Marathon Kids- such as mileage tracking, which are helpful for students to visualize their progress; and implementing a celebratory event to promote Marathon Kids and physical activity in general. One MK coach shared: "…in the past, you know, like having that big [district] event was nice to get a little more motivation…and kids excited…"

> *"Seeing their progress and tracking their achievement makes a huge difference in a kid to be able to visualize." –MK Coach*

MK Coaches also identified the importance of training classroom teachers to implement the program (which is also listed as a barrier below), and the importance of creating a school culture supportive of physical activity. MK coaches recognized the key role their school district is playing in promoting Marathon Kids and a physical activity culture, with one coach sharing: "I give our a PE coordinator and a lot of credit for promoting and reminding us about expectations and supporting us with the promotion of marathon kids as a program." Of note, another MK coach shared the impact of Marathon Kids on promoting a positive physical activity culture among students and faculty (see accompanying quote).

> *"…[Marathon Kids] just sparked conversations with teachers sharing stories about how kids achieve their marathon. 'They were working hard, you know, they even gave up their recess to go run just because they're working so hard to get their miles.' I think [MK] just sparks successes that I've heard… [It] is just sparking the conversations about physical activity [and] achieving goals. …[C]onversations that may not normally take place, you know?" – MK Coach*

Barriers: Three core themes emerged when MK coaches were asked about barriers for implementing the MK program: t*he challenge of tracking miles, challenges with ensuring implementation of program with classroom teachers,* and *need for administration support for program implementation* (Table 16). In addition to the general challenge of tracking miles for all students for a given school, MK coaches noted the challenge of ensuring classroom teachers are implementing the program- which included tracking miles and keeping track of those miles. Digital tracking was cited as a possible enhancement to address this challenge, as well as a recommendation for an online tracking system that would facilitate recording of student miles walked or run (see below). With regard to implementation of the program by classroom teachers, one MK coach noted challenges with being an intermediary person with the classroom teachers: "The only reason I don't feel confident [in implementing the program] is because it's hard to get all the information out to all the teachers, because they're the ones…in our district…in charge of implementing the program. So basically I'm just relaying information person." Another coach noted the importance of principal support to ensure that the program is being implemented by classroom teachers (see accompanying quote).

> *"We need a principal…that enforces [MK implementation]. I can't tell the teachers that they need to be doing [MK] even though it should be in their lesson plans." –MK Coach*

It should be noted that, while one MK coach cited the need for more principal support, another MK coach underscored the important role the principal has played at their school with Marathon Kids. Overall, MK coaches also cited the helpful role the school district has played in supporting the implementation of Marathon Kids.

Recommendations for Better Support of Marathon Kids Coaches. Lastly, we explored ways that MK coaches could be better supported in implementing the program. Two key themes emerged: *recommendations for enhanced resources with implementing MK* and *enhanced organizational support with implementing MK* (Table 16). Key recommendations for enhanced resources included:

- ✓ Provide beginning of the year *tips/bullet points* for implementing program
- ✓ Develop and provide a Marathon Kids app for phone
- ✓ Provide a digital tracking system for MK coaches
- ✓ Create an online dashboard where PE teachers/classroom teachers can see student data
- ✓ Provide 4th marathon prize with all rewards at same time

> *"I know a lot of schools that are using EZ Scan with Marathon Kids, so it would be nice if either Marathon Kids worked with them or came up with their own program." – MK Coach*

With regard to the second theme, *enhanced organizational support,* two of the MK coaches noted that it would be helpful to have periodic check-ins with a MK team staff member to provide further support with the program (Table 16).

Table 16. Best practices, barriers, & recommended support identified by coaches for implementing Marathon Kids. *End-of-Year Interview - Marathon Kids Pilot Study, Spring 2019. (n=3 MK Coaches) (Marathon Kids Schools Only)*

BEST PRACTICES
Theme A: Approach for Delivering Program
Providing/scheduling time to do laps/miles (e.g., during PE class or other time of day)
Provide some running time, and then tag-type games
Tracking miles individually and as a class
Providing classroom competitions
Providing reminders about Marathon Kids in assemblies
Providing visuals in hallways related to Marathon Kids
Implementing a big event to provide motivation to students
Theme B: Teacher Involvement
Training classroom teachers to deliver program
Theme C: School Physical Activity Culture
Having a district that is supportive of Marathon Kids
Promote school culture of physical activity
BARRIERS
Theme A: Challenge with Tracking Miles
Keeping track of mileage logs
Difficult for PE instructors to track all students' mileage
Theme B: Ensuring Implementation of Program with Classroom Teachers
Monitoring classroom teachers and ensuring they are implementing the program correctly
"[It is] up to classroom teachers if students are running in classrooms."
Theme C: Need for Administration Support for Program Implementation
Principal who is on board to enforce MK in classrooms is needed
RECOMMENDATIONS TO BETTER SUPPORT COACHES
Theme A: Enanced Resources with Implementing Marathon Kids
"Beginning of the year 'tips' [and] 'bullet points' to implement program
Marathon Kids app for phone
Digital tracking
Program dashboard online where both PE teachers/classroom teachers can see student data
Not ordering 4th marathon prizes separately at end of program; get all rewards at the same time.
Theme B: Enhanced Support with Implementing Marathon Kids
Marathon Kids team member checking in once per semester/Frequent check-ins & support follow-ups

Finisher Survey

Descriptive Characteristics

As described above, the *Finisher Survey* was conducted with MK coaches participating during the 2018-19 school year with the aim of eliciting further insights about the impact of the MK program on increasing opportunities for young people's physical activity as well as the implementation of the program, including barriers and best practices for implementation. In collaboration with MK staff, the survey was administered online during spring 2019. A total of n=478 MK coaches participated in the survey out of a universe of n=676 who were sent the survey, representing a 70.7% response rate. Just over two-thirds of respondents were female (68.5%), with a similar proportion representing Title 1 schools (71.3%) (Figure 2). Survey respondents represented 35 states from across the U.S., with Texas representing the largest number of respondents (n=262 or 54.8% of sample), followed by California (n=55), Oregon (n=21), Ohio (n=15), and New York (n=13). The remaining states had less than 10 participants each (see Figure 2 and Appendix F, Table 1 for breakdown by state).

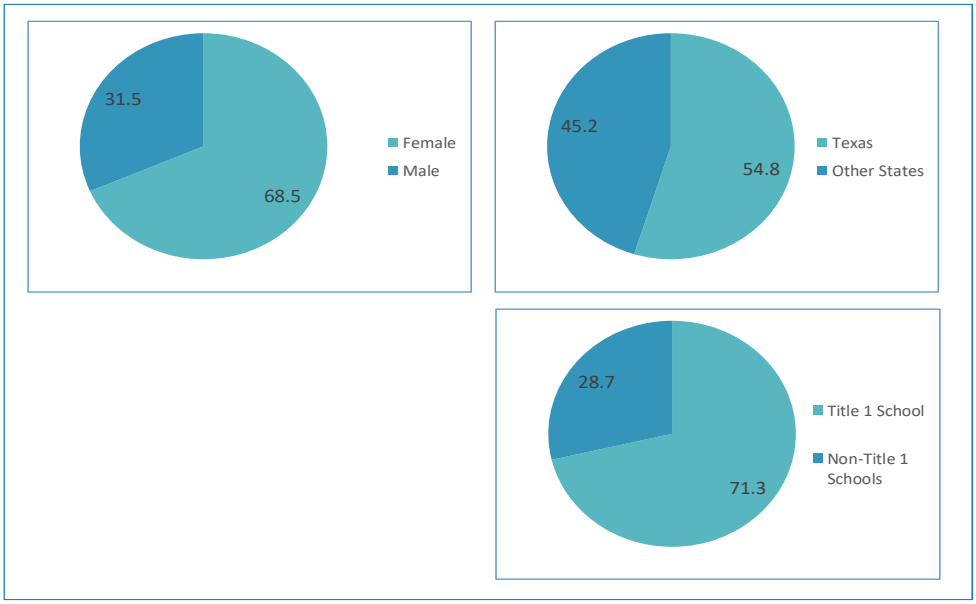

Figure 2. Marathon Kids Coach sample characteristics*, Finisher Survey-MK Pilot Study*, Spring 2019 (n=478 coaches).

Impact & Satisfaction with Marathon Kids

In exploring the implementation impact and perceived satisfaction of the Marathon Kids program among MK coaches, we assessed:

- ✓ *Average reach of children participating in Marathon Kids clubs during 2018-19;*
- ✓ *Percentage of child participants who completed up to four marathons;*
- ✓ *Average minutes of walking/running provided during the week and day;* and
- ✓ *Perceived coach satisfaction with the MK program* (composite score and individual scores for 8 items related to perceived enjoyment with MK and perceived impact on student outcomes such as confidence in being physically active).

Reach of Participants and Marathons Completed: MK coach respondents reported a mean of 145 student participants per club, with a range of 3 to 1200 participants. Based on numbers reported by grade level, MK coach respondents indicated ***reaching n=65,163 children*** in grades 1st through 12th. Among children participating in Marathon Kids running clubs, the majority were elementary school-age (91.9%), followed by middle school (7.2%) and high school (.9%) (Figure 3).

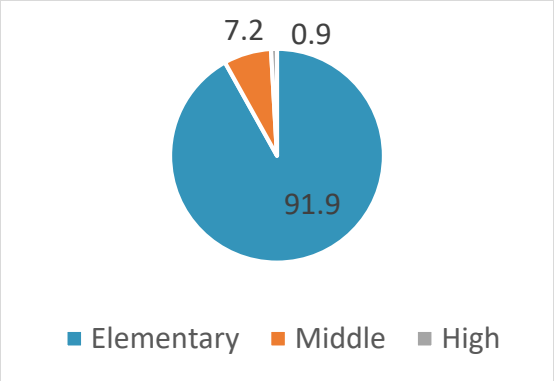

Figure 3. Composition of student participants in Marathon Kids by grade level, Finisher Survey- MK Pilot Study, Spring 2019

Of the student participants registered at the beginning of the season, MK coach respondents reported an overall high participation rate in the program, with 89.7% of respondents indicating 75% or more of students participated in the program since initial registration, 83.7% indicating a participation rate of 85% or more, and 66% indicating a participation rate of 100% or more (data not shown). Of note, 21.6% of coach respondents indicated greater than 100% participation, meaning that more students participated after initial registration.

In assessing student marathon completion rates- an indicator or program impact, we analyzed both overall completion rates for the full sample, as well as completion rates stratified by the initial marathon goal set by the MK coach (i.e., for MK clubs that set 1 marathon goal vs. 2 marathons goal, etc.). For the full sample, MK coaches reported an overall high rate of completion of marathons, with an average of 86.4% of students completing one marathon (Figure 4). As expected, that average percentage of completion decreased as number of marathons increased. Despite this decrease, it is notable that just under half of participating children (49%) completed three marathons, or the equivalent of 78.6 miles walked/run over the course of the school year. Mean percentage of completion rates were similar when analyses were stratified by *Texas vs. Other states* and *Title 1 schools vs. non-Title 1 schools* (Appendix F, Table 2).

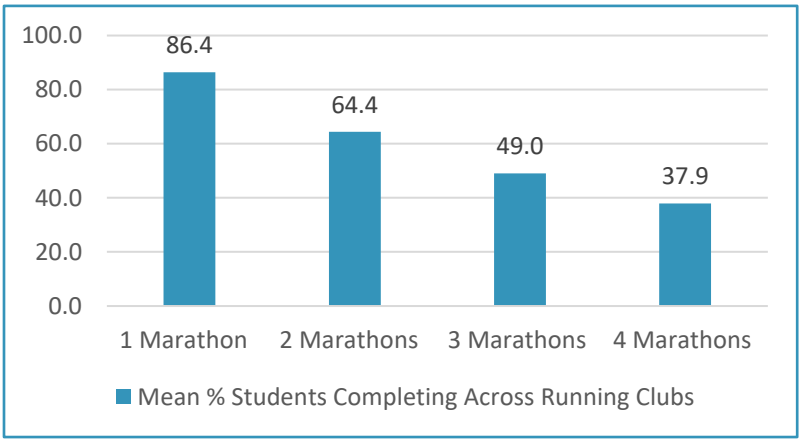

Figure 4. Mean percentage of students completing marathons. *Finisher Survey- MK Pilot Study,* Spring 2019 (n=478 coaches).

In stratifying the analysis by the initial 'distance goal' set by MK coaches for their club, we found similar findings. Of the total sample of MK coaches, 7.3% set one marathon goal, 7.1% set two marathons goal, 7.9% set three marathons goal, and 77.6% set four marathons as a goal. Among

those who set one marathon as a goal, 83.8% completed one marathon, 30.3% completed two marathons, 18.5% completed three marathons, and 13.7% completed four marathons. Among those who set two marathons as a goal, 80.9% completed one marathon, 49.3% completed two marathons, 21.2% completed three marathons, and 14.6% completed four marathons. Among those setting three marathons as a goal, 84.2% completed one marathons, 58.2% completed two marathons, 29.6% completed three marathons, and 14.4% completed four marathons. Lastly, among those who set four marathons as a goal, 87.5% completed one marathon, 69.7% completed two marathons, 56.4% completed three marathons, and 44.7% completed four marathons.

Average Minutes of Walking/Running Provided: An important contribution of the Marathon Kids' model to children's physical activity is the opportunity to shape the school eco-system to provide additional time for children to engage in physical activity. In assessing the potential impact of the program on increasing opportunity for children's physical activity, we assessed the average number of minutes that MK coaches provided for children's walking and running in the before, during and afterschool setting during the 2018-19 year.

In doing so, we first explored with MK coaches the time period and setting in which they implement the program. As presented in Figure 5, we found a good diversity of time periods across the school day that time is scheduled for children to walk and run as part of the MK program. The most popular times of day for scheduling walking and running were during PE (62.1% of coaches), followed by recess time (42.3%) and after school as part of an existing program (37.9%). Of note, just under a third (32.4%) of coaches scheduled time before school begins- a time of day that has received less attention for school-based physical activity in the scientific literature.

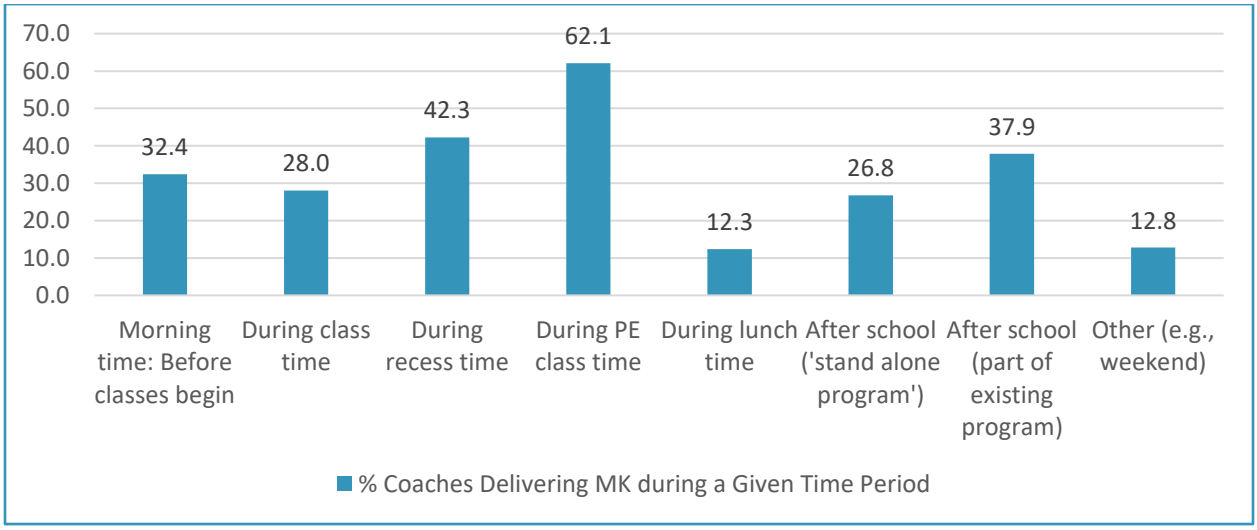

Figure 5. Delivery of Marathon Kids program by different times of the day and settings*, Finisher Survey- MK Pilot Study,* Spring 2019 (n=478 coaches).

In exploring the minutes provided of walking and running time, MK coaches reported an average of 112 minutes provided during the school week, representing an average of 22.4 daily minutes of

walking/running delivered via the Marathon Kids program. No significant differences were found in provision of weekly or daily minutes of walking/running by Texas vs. other states (p=.093) or by Title 1 school status (p=.14) (Appendix F, Table 3). While PE class was identified as the most common time of day for scheduling walking/running for Marathon Kids, delivery of MK in the afterschool setting resulted in the most time scheduled for walking/running during the school week. Approximately 66 total weekly minutes of walking and running were provided in either a 'stand alone' or existing afterschool program (each) compared to 38 minutes in PE class and 35 minutes in the before school setting- settings with the next highest number of walking/running minutes provided (Appendix F, Table 3). Of note, these findings indicate that MK can help provide over 100 additional weekly minutes of walking and running time outside of PE class via implementation of MK in the before and afterschool settings.

Coach Satisfaction with Marathon Kids Program: Coach respondents indicated high satisfaction with the Marathon Kids program as relate to its benefits for physical activity promotion for child participants and perceived satisfaction and enjoyment of the program (Table 17). For the overall sample, we found a mean MK satisfaction score of 50.6, with 8 representing the lowest possible score and 56 representing the highest possible score. While satisfaction scores were high across the sample, MK coaches from states outside Texas reported slightly higher satisfaction scores compared to Texas coaches (51.4 vs. 49.9, respectively; p=.02). Coaches from Title 1 schools also reported higher satisfaction scores compared to coaches from non-Title 1 schools (51.2 vs. 48.1, respectively; p=.001) (Appendix F, Table 4). With regard to individual satisfaction indicators (highest possible score=7), scores were also high across indicators, with the highest score (6.54) noted for "I would recommend MK to a friend/colleague". Lastly, as an indicator of support for the program, 93% of coaches expressed their intentions of doing MK again next year (Table 17).

Table 17. Satisfaction with Marathon Kids and Perceived Impact on Student Physical Activity. *Finisher Survey - Marathon Kids Pilot Study, Spring 2019.*

	Total (n=478) mean/%	(SD)
I plan on doing MK again next season (% Yes).	*92.90%*	--
Total mean MK satisfaction score[a]	50.60	6.70
a. I enjoyed doing MK very much this year[b].	6.46	0.98
b. I would recommend MK to friend/colleague[b]	6.54	0.85
c. MK helped my runners reach daily goal of 60 min MVPA[b]	6.29	1.06
d. MK helped my runners feel more confident about ability to engage in PA[b]	6.37	0.95
e. Logging their miles and seeing progress helpd my runners stay engaged and motivated to reach their marathon goal.[b]	6.27	1.09
f. By the end of the season, I saw improved communication and social skills in kids who participated in program.[b]	5.98	1.26
g. Our runners enjoyed participants in MK this year.[b]	6.42	0.9
h. MK is considered an important part of our coordinated school health plan.[b]	6.08	1.31

Abbreviations: MK, Marathon Kids; SD, Standard Deviation.

[a]Composite variable based on summary of items a-h and a Likert-type response scale of 1 (not at all true) to 7 (very true), with range of 8 (low satisfaction) to 56 (high satisfaction). Cronbach alpha=.92. [b]Single item variable, with 1 (not at all true) and 7 (very true).

Implementation of Marathon Kids

In addition to the time of day that MK coaches schedule for running and walking - as noted above, we also aimed to learn about specific ways MK coaches are implementing their running clubs. Key facets of program implementation explored included:

- ✓ *How MK coaches track participant miles* walked and run;
- ✓ *Support received* by MK coaches from MK staff and other mechanisms such as the website;
- ✓ *Perceived usefulness of specific resources* available to MK coaches to support their running clubs, such as the MK running club lessons and running tips;
- ✓ *Communication with parents* about the MK program; and
- ✓ *Implementation of MK events* such as kick off and finisher ceremonies.

Tracking of Marathon Kids Participant Miles Walked and Run. Coach respondents reported a variety of ways that they help their MK student participants track miles (Figure 6). Over half of coaches indicated that participants tracked their own miles on an individual basis (66.1%), while just over a quarter (25.9%) indicated that participants tracked miles as a group in which they pooled their cumulative miles. The majority of coaches reported that students use paper mileage logs to track their miles walked/run (56.5%), while roughly a quarter (24.7%) reported use of digital tracking. Just over a quarter of coaches reported displaying mileage miles in the classroom (27.2%), while a higher percentage (42.3%) reported displaying mileage logs in halls or other public areas.

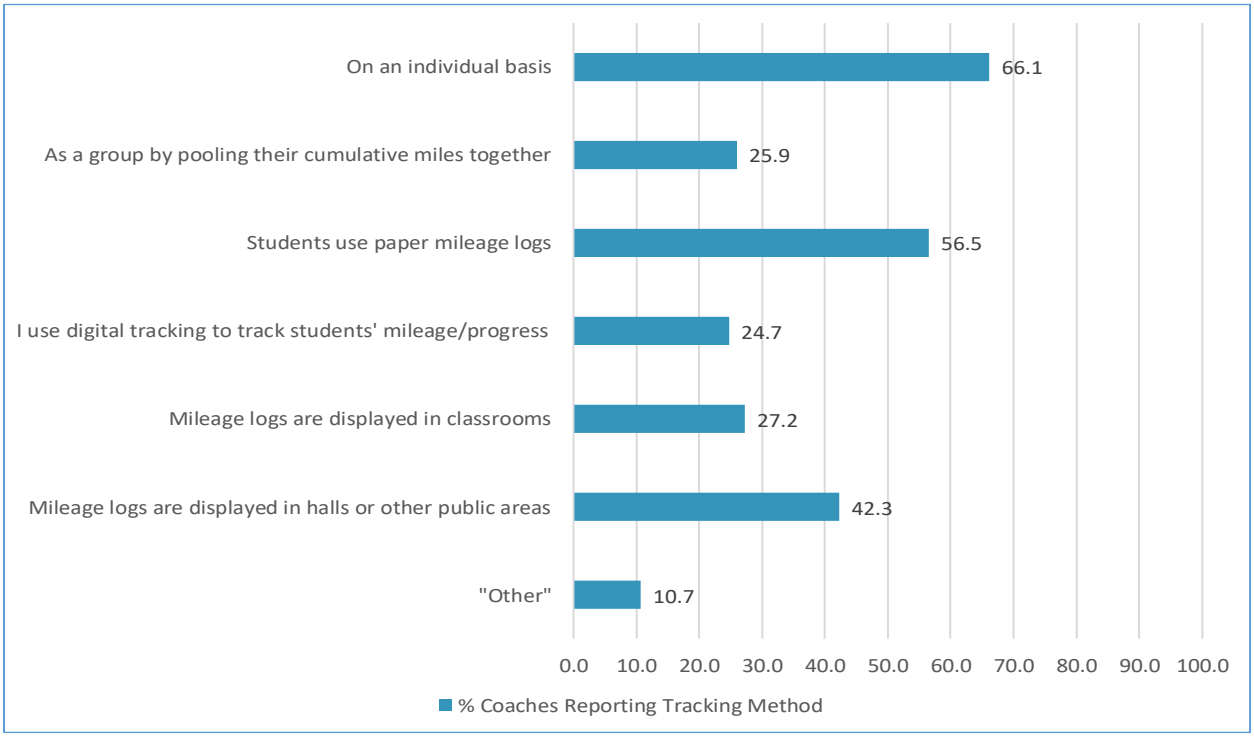

Figure 6. Percentage of Marathon Kids coaches reporting different methods for participant tracking of miles walked and run. *Finisher Survey- Marathon Kids Pilot Study*, Spring 2019.

"Other" forms of tracking cited by MK coach respondents included:

- ✓ Classroom teachers help students track miles
- ✓ Use of excel spreadsheets
- ✓ Digital tracking that included EZScan and Apple Watch
- ✓ Use of poster boards to track
- ✓ Use of popsicle sticks, lanyards with a badge where coaches mark miles; slips of paper that get punched for each lap
- ✓ Logs are displayed in gyms *(see* Appendix F, Table 4, *for full breakdown of 'other').*

The following quotes illustrate some of the creative ways MK coaches are helping to track miles:

"Each student has a paper shoe that is hanging in the hallway with mile markers. They were able to move their shoes on a weekly basis down the hallway!! This was very motivating." – MK Coach

"Students use Popsicle sticks to track, and then I log the miles digitally." – MK Coach

"I display a 'star chart' for each classroom teacher. As students finish their mileage log, they earn a star. After each student earns their 1st marathon, 2nd marathon, etc., the class is given their class star." – MK Coach

"In their leadership binders kids get slips that get punched for each lap they run. They turn them in to a jar in their room every day. They are collected and posted weekly." – MK Coach

Support Received for Implementation of Marathon Kids Program/Running Club. Five survey items assessed how well MK coaches feel they are supported in implementing the overall MK program and their specific MK running clubs; a sixth item, analyzed separately, assessed how confident MK coaches feel in implementing the program. Support received items are presented in Appendix F, Table 6 and covered: *the usefulness of the MK Welcome Packet and Coach's Guide; level of support from MK for coach to implement program; the ease of navigation of the Coach's Club on the MK website;* and *whether the Nike rewards motivated the coach's runners to reach their milestones*.

In assessing the composite *MK support received* score based on the five items, we found overall high reported support received by MK coaches, with a mean score of 21, with a lowest possible score of 5 and a highest possible score of 25. While support received scores were high across the coach respondents, MK coaches based outside of Texas reported slightly higher composite scores compared to coaches within Texas (22.2 vs. 21.5, respectively; p=.02), and MK coaches based in Title 1 schools reported higher scores compared to coaches based in non-Title 1 schools (22.1 vs. 21.0, respectively; p=.006). Similarly, scores for single item support measures were high overall, with the highest mean scores reported for support received by coach from MK staff (4.4) and motivation of Nike rewards (4.5) (with lowest possible score of 1 and highest score of 5); the lowest score was provided for ease of navigation of the online Coach's Club (4.3) (see Appendix F, Table 6).

Lastly, coaches reported high overall confidence in implementing the MK program, with a mean score for the total sample of 4.5 (with 5 being the highest possible score). Higher confidence scores were reported for coach respondents outside of Texas (4.6 vs. 4.4 for coaches in Texas, p=.02) and Title 1 school coaches (4.57 vs. 4.38 for non-Title 1 coaches, p=.02) (see Appendix F, Table 6).

Perceived Usefulness of Marathon Kids Resources. In exploring further how to best support MK coaches with implementation of the program, we also assessed the usefulness of ten MK resources as listed in Figure 7 below. MK coach respondents reported an overall high level of perceived usefulness across the MK program resources, with a total mean score of 33.8 for the composite variable of ten resources, with 10 representing the lowest possible perceived usefulness score and 40 representing the highest possible perceived usefulness score. No differences in total resource usefulness scores were found by geographic place of MK running programs (Texas vs. Other) or by Title 1 vs. Non-Title 1 schools (Appendix F, Table 7). While perceived usefulness scores were high across the ten resources assessed, the resources with the highest ratings were the Mileage Logs (3.7 out of a total possible score of 4), followed by the Mileage Certificate (3.7), the Running Club Tips and Running Games (3.5 each). The Kids Pledge/Bib received the lowest score (3.2) (Figure 7).

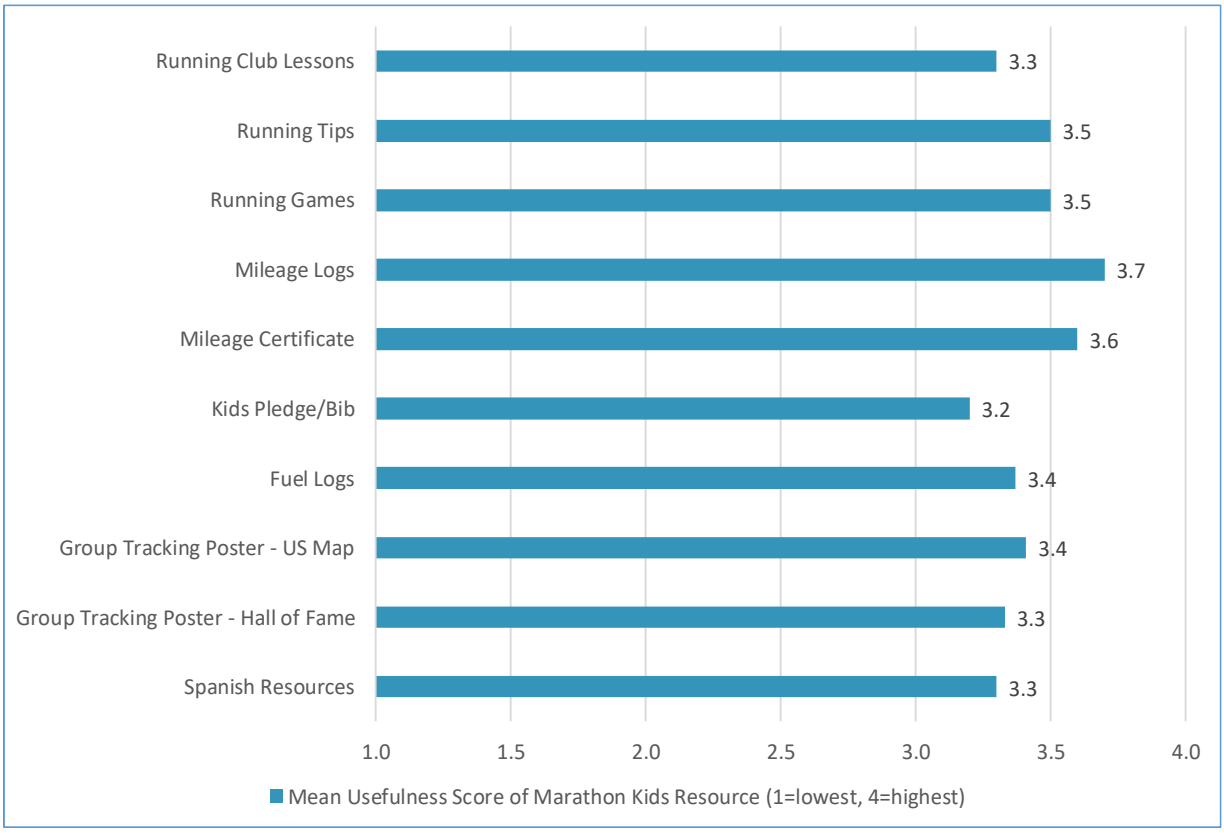

Figure 7. Mean usefulness score of Marathon Kids program resources, *Finisher Survey - Marathon Kids Pilot Study,* Spring 2019 (n=478 coaches).

Marathon Kids Resources Not Used. In addition to assessing the usefulness of MK program resources, we asked MK coach respondents to indicate resources they did not use this past year (Figure 8). While half or more of respondents used each resource, resources that were less used included: Spanish Resources (47.8% of respondents did not use), Kids Pledge/Bib (34.9%), and Fuel Logs (31.9%).

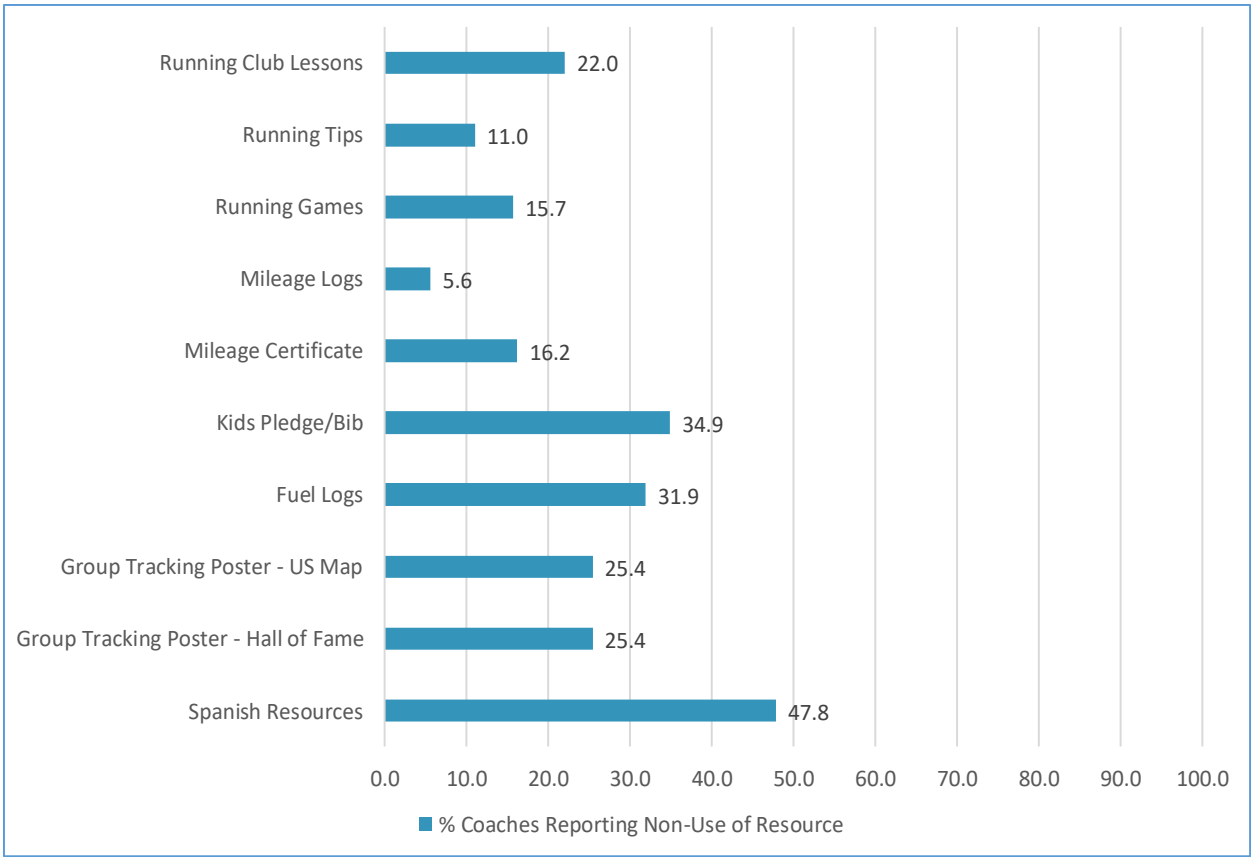

Figure 8. Percentage of Coach Respondents Indicating Non-Use of Marathon Kids Resources, *Finisher Survey - Spring, 2019* (n=478)

Communication with Parents about Marathon Kids Program. MK coach respondents indicated several ways they communicate with parents about the MK program (Figure 9). The most cited approach for communicating with parents was having PE teacher and/or classroom teacher distribute MK information via students to take home to parents (64.6%), followed by distributing MK information directly to parents via a flyer, letter or email (52.5%). Fewer coaches indicated that parents were informed about MK at a meeting (19.7%), and just under a quarter indicated that parents were informed about MK via a newsletter (23.6%). Just over one quarter of coaches (28.0%) indicated they sent a reminder notice to parents about MK during the program (Figure 9). *(Note: subgroup analyses by geography and school economic status were not possible due to formatting of question).*

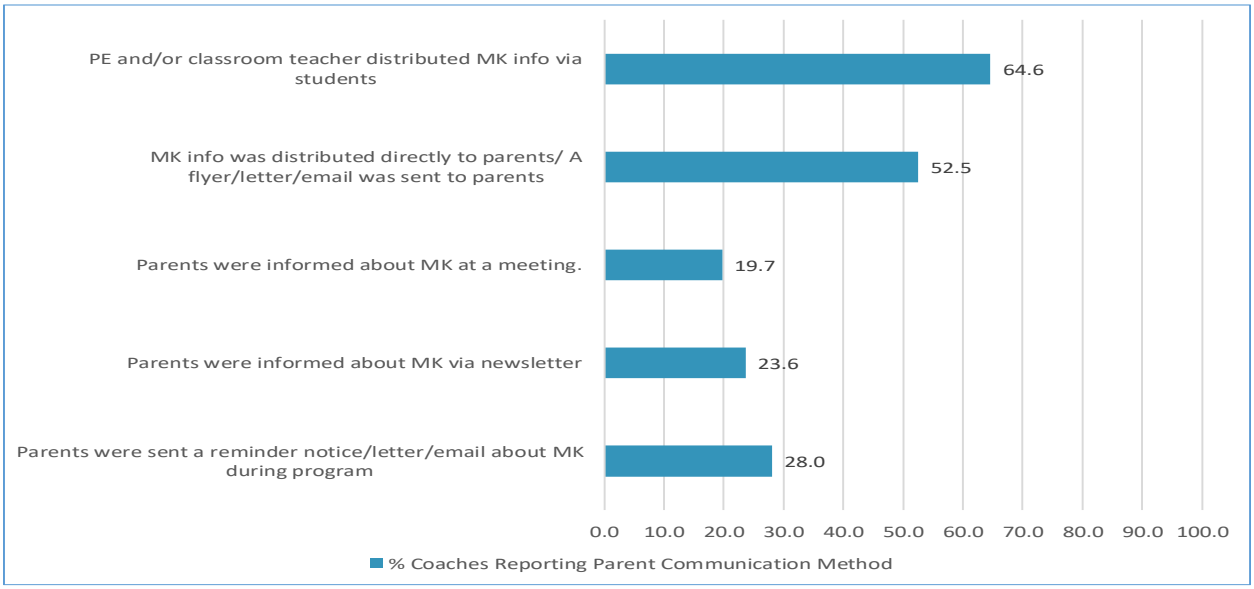

Figure 9. Communication with Parents about Marathon Kids, *Finisher Survey – Marathon Kids Pilot Study,* Spring 2019 (n=478)

Other Forms of Parent Communication. MK coach respondents also shared other ways they communicate with parents via an open-ended response option, which included:

- ✓ Class Dojo
- ✓ "Classroom teachers informed parents via email, phone calls, online, etc."
- ✓ Face-to-face at dismissal
- ✓ Facebook page/School Facebook page for students that had permission to be photographed
- ✓ "Once a week at our Community's Morning Assembly Announcements we celebrate finishers too! This way the entire community of San Antonio cheers for the finishers!"
- ✓ Parent conference
- ✓ Remind app/Remind 101
- ✓ Social media/ "We posted the information on our team website."/Team website
- ✓ Student word of mouth
- ✓ "No parent communication. I only told my runners."

Implementation of Marathon Kids Events. Lastly, we assessed the percentage of MK coaches that implement Marathon Kids kick-off events/ceremonies, Finisher celebrations/ceremonies, and other types of MK events (Figure 10). While just under half (49.0%) of MK coach respondents implemented a kick-off event/ceremony to start the MK season, the majority of respondents (74.3%) implemented a Finisher celebration/ceremony at the close of season. MK coach respondents also reported holding celebrations as part of larger events (42.3%), and just over three out of respondents invited parents and school faculty to attend MK events (62.1%). *(Note: subgroup analyses by geography and school economic status were not possible due to formatting of question).*

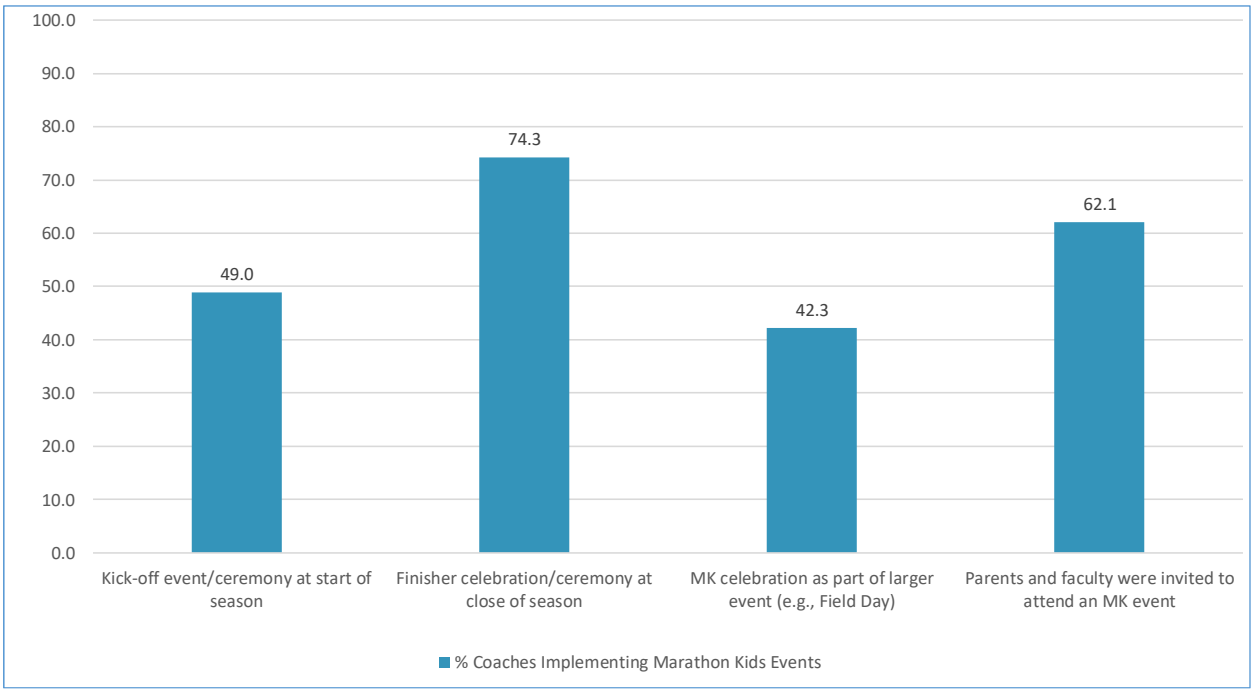

Figure 10. Implementation of Marathon Kids Events. *Finisher Survey – Marathon Kids Pilot Study*, Spring 2019 (n=478).

Best Practices, Barriers and Support Recommendations for Implementation of Marathon Kids

Lastly, we explored MK coaches' best practices, barriers and challenges, and recommendations for support for implementation of MK running clubs using an open-ended question format.

Best Practices for Implementation of Marathon Kids (Finisher Survey)

In exploring *best practices* for MK implementation, MK Coaches (n=478) were asked: "Please share with us your three best practices for implementing Marathon Kids. What works for your school/Marathon Kids club that might be helpful for other Marathon Kids' coaches?" Responses were uploaded to NVIVO (version 11) and analyzed to identify key overarching thematic categories as well as subthemes within these categories. Box C presents a summary of the ten thematic categories identified; below we provide a summary description of these categories along with key subthemes.

Box C. Marathon Kids Program *Best Practices* Thematic Categories - *Finisher Survey, Spring 2019*

1. General organization & planning
2. Scheduling Marathon Kids running clubs
3. Recruitment of students for Marathon Kids running clubs
4. Marathon Kids running club approach and recommended activities
5. Tracking and logging miles
6. Public promotion of miles walked/run and runners
7. Social support for student runners
8. Positive philosophies for Marathon Kids running clubs
9. Promotion and communication of Marathon Kids
10. Marathon Kids events

General Organization & Planning. A key theme cited across MK coach respondents was the importance of investing in the organization and planning of one's running club (Appendix F, Table 8). One MK coach summarized well this key theme: "Setting up all things running club prior to the start of the school year – this would help with a diversified interest in running club." In addition to the general themes of organization and planning, key subthemes included:

- ✓ *Time management & scheduling*: Several coaches touched on the importance of time management as well as scheduling well one's running club (see specific section on this topic below).

- ✓ *Contingency planning:* In addition to scheduling one's club as well as time for outdoor running, some coaches recommended contingency planning: "Having a rain/mud plan," with recommendations that included providing running-type activities and games for inside the gym.

- ✓ *Contact Information:* Developing a contact information spreadsheet was a key organizational best practice recommendation: "Having the contact info and pick up info on a spreadsheet for when there are new volunteers."

- ✓ *Attendance:* Key recommendations related to attendance included "Take attendance each week", "Hold runner[s] accountable for attendance" and "Have the parents and students sign a form that has the attendance and discipline policies."

- ✓ *Transportation:* Related to having parent and student contact information, some MK coaches recommended exploring transportation plans, such as providing "Car pool transportation for after school."

- ✓ *Support Network*: A key subtheme related to organization and planning was the importance of creating a support network for implementing one's MK running club. Of note, many MK coaches highly recommended the inclusion of parents and other teachers to help motivate, facilitate and spread the word about Marathon Kids. With regard to parents, MK coaches provided several helpful recommendations, which included:
    - "Get parents involved (use an app like ClassDojo…I was amazed how many parents use it and really changed how I communicate with them)."
    - "Having a few parents definitely helped at practice. They were there to support the kids as well as help log miles and encourage growth."
    - Scheduling meetings with parents to promote their involvement ("Organized a meeting with parents"/ "Parent kick-off meeting"/"Planning events at school to encourage parents to come out")
    - Involving parents in walking and running, with one MK coach sharing: "Having parents come walk/run too." Another MK coach shared an innovative approach for parents: "We started a walking club for parents."

Scheduling Marathon Kids Running Clubs. Related to the general theme of organization and planning, MK coach respondents provided various recommendations for the best ways to schedule one's MK running club, which spanned the before, during, and after school times of day (Appendix F, Table 9). A helpful recommendation that applies for all MK coaches scheduling their running clubs is summarized well by one MK coach: "Make sure your schedule is flexible enough for parents, students, and school." In addition to recommendations to schedule running time *before, during (in PE class, recess and/or during class time), after school*, *on weekends, at home,* and *on multiple days, times and settings,* several coaches emphasized the importance of having a set schedule for one's running club, with recommendations that included having designated days for the club. Related to this theme, a helpful recommendation by one MK coach was to "[t]ell the children which of the days of the week are going to be running days so they address appropriately."

Recruitment of Students for Marathon Kids Running Clubs. MK coach respondents also provided several useful recommendations for recruiting students to participate in the running clubs (Appendix F, Table 10), including:

- ✓ *Promoting MK running clubs via classrooms and PE class,* which included "Going to classroom and hyping the club." One innovative MK coach shared the following approach for her/his recruitment strategy: "I started by making a video that I asked all the teachers to share to all the classes and then I personally went into each classroom and spoke about the club. Then I got staff members that were interested in being part of the club to join to help run it."

- ✓ *Providing informational meetings* before the season starts for parents and students, including promotion of the club during back-to-school night.

Marathon Kids Running Club Approach and Recommended Activities. MK coach respondents provided rich recommendations specific to the approach for implementing one's MK running club along with recommendations for specific content and activities (Appendix F, Tables 11a-c):

- ✓ *General recommendations for Marathon Kids running club*: General recommendations for implementing one's running club ranged from scheduling one's MK running club (as discussed above), to whom to recruit for running clubs –with some coaches noting that grades 2-6th seemed to work best for the elementary-school aged students, to best practices such as having students wear their Marathon Kids shirts every Friday or on selected days (Appendix F, Table 11a). An important general recommendation for implementing one's MK running club was to recruit dedicated individuals who can serve as an MK coach, with several noting the importance of identifying more than one coach or volunteer who can help with the running club. With regard to the importance of the quality of person, one MK coach recommended: ""Recruiting Coaches that you know will make a great impact and know that they are passionate about impacting the community and youth." Lastly, a general recommendation provided by coaches for implementing one's running club emphasized the importance of *continuity and routine* with one's MK running sessions.

- ✓ *Safety first*. MK coaches also emphasized the importance of safety. One coach emphasized: "Safety first; you want to push kids to do their best, but don't over exert them as they know their bodies best and know their limits."

- ✓ *Extrinsic motivation*. Providing extrinsic motivation in the form of incentives and rewards was also a common general best practice for motivating students cited by MK coaches (Appendix F, Table 11a). Several MK coaches noted that the rewards provided by Marathon Kids specifically increase participation as well as motivation of student runners, with one coach stating: "The rewards incentives was huge motivation for our students...". Selected best practices cited included:
    - "Promoting Marathon Kids to teachers and students while displaying the rewards."
    - "Showing them their incentives as they participate in each marathon."
    - "I give Marathon Kids rewards at assemblies so students are recognized in front of Staff and Student population."
    - "Provide incentives as a group to also reduce burden."
    - "Use toe tokens as incentives (students love earning them)." and ""Incentives keep the kids motivated. I use toe tokens and extra incentives beyond the rewards they can earn."

> *"Tell the students about the Nike prizes and tell them THEY CAN DO IT! ENCOURAGE THEM!." –MK Coach, Finisher Survey*

- ✓ *Water/Hydration*: An important consideration for implementing one's MK running club cited by MK coaches was the need to provide water as well as provide emphasis on hydration practices throughout the running experience. Best practices recommended by MK coaches included having each runner have their own refillable water bottle and having volunteers to monitor water station on the course (Appendix F, Table 11a).

- ✓ *Music*: Of note, several MK coaches recommended incorporating music into the running club. One MK coach shared: "Using music while the students ran was huge. It motivated them so much." (Appendix F, Table 11a).

- ✓ *Running sessions:* MK coach respondents provided thoughtful recommendations for the content and approach for one's running club (Appendix F Table 11b), which included:
    - Making an introduction at the beginning and a debrief at the end of each session
    - Developing a structured lesson for each session
    - Communicating with students about structure of each session
    - Modeling proper running techniques
    - Scheduling warm-up and cool-down activities
    - Providing stretching activities

> *"I really enjoyed the sample lessons [MK staff] provided and the games." –MK Coach, Finisher Survey*

- Encouraging students to build on their laps each week and track progress
- Varying the types of running
- Incorporating running games into the sessions, with one MK coach recommending the incorporation of different running games to keep students engaged
- Allowing students to choose another physical activity after their running time
- Having students run in groups based on their level of performance
- Incorporating monthly challenges
- Providing a contingency plan due to weather, such as using the gym
- Incorporating other health-related content in the sessions such as healthy recipes

"Do different kinds of running games to keep it new." –MK Coach, Finisher Survey

✓ *Support structures, student roles, and group contingencies*. MK coaches recommended several best practices for creating support structures for implementing the running sessions, which included general support structures as discussed above ("Establishing a strong network of support"), student ownership and leadership roles for implementing the sessions ("I have student leaders who push, motivate, and support their peers"), and creating group contingencies to further motivate and support student runners ("Have students partner with teammates to motivate, challenge and keep them accountable") (Appendix F, Table 11c).

"Getting the kids pumped up to run, exercise and have fun as a group or class while doing it. Allowing the kids to motivate themselves and others to keep going the distance." –MK Coach, Finisher Survey

Tracking & logging miles. MK coach respondents provided a range of best practices for how to support student participants with tracking and logging their miles run or walked - a core facet of the Marathon Kids model (Appendix F, Table 12a-c). Best practices included:

✓ *General tracking recommendations*: A common best practice cited by MK coaches was the importance of setting up a good tracking system to help students track miles run and walked. Some MK coaches specifically shared how they liked the updated mileage form and as well as the ease of use of the forms.

"I love the structure of the [Marathon Kids] program; the mileage logs are easy for the K to 2nd grade students to use." –MK Coach, Finisher Survey

- ✓ *Digital tracking:* While MK coaches noted several low-cost approaches for tracking student miles (see below), a common best practice recommendation by many MK coaches was to incorporate *digital tracking* of student miles. Advantages of digital tracking noted by coaches included saving time with recording and calculating miles, helping students see their progress and the progress of their peers, and overall ease of implementation. Digital tracking approaches noted included:
  - EZ Scan (the most commonly cited digital tracking approach)
  - Google Sheets and Google Classroom to track Run Club data
  - Instagram Run Club account

> *"For the first time, we implemented logging miles using EZ Scan, and it make it a breeze! It was so much better than the old Popsicle stick method. It also saved us a lot of time with recording and calculating." –MK Coach, Finisher Survey*

- ✓ *Popsicle sticks, markers, and other low-cost tracking approaches*. Despite recommendations from some MK coaches to use digital tracking, many MK coaches continue to use and recommend traditional tracking approaches (Appendix F, Table 12b), which included:
  - Popsicle sticks. One MK coach shared: "I have used Popsicle sticks to track kids' laps, and at the end they mark how many they have in their hand in the clip board with their teacher name on it. I added [the sticks] at the end of the week and total their miles on the following sign sheet."
  - Stamps: One MK coach recommended: "Track their laps by stamping their hands. Students love to show their stamps to their parents!"
  - Markers: "Bring out the water-based markers and mark their hands for every lap they complete- very easy!"
  - Clickers to track laps.
  - Tokens and poker chips.
  - Bracelets: One MK Coach suggested using colored bracelets to track laps by groups.

- ✓ *Student tracking.* MK coach respondents also emphasized the importance of involving students in tracking of their own miles in order to create more ownership and accountability for themselves and their peers, create more efficiencies with program implementation, and to get students more excited about the program (Appendix F, Table 12b).

> *"Get the students excited by allowing them to track their own progress on the logs." –MK Coach, Finisher Survey*

- ✓ *Group-based visual tracking*. Some MK coaches recommended tracking miles as a group and sharing progress in public spaces. One MK coach shared: ""I have a huge bulletin board

that tracks all MK team (classroom) progress. Students and teachers visit daily to move their shoe around the MK track…"

- ✓ *Where and how to track miles.* Lastly, MK coaches provided several recommendations for where and how to track miles (Appendix F, Table 12b), including:
  - Using PE class to track miles
  - Spending time at end of each practice to complete mileage logs together
  - Taking attendance with lap numbers
  - Organizing runner logs by classroom teachers
  - "Having easy access to turn in completed logs and get new ones has made the most difference."

Public promotion of miles walked/run and runners. Related to tracking of miles, a key best practice recommended by MK coaches was to create a public display to track miles walked and run and also to highlight and celebrate the student runners (Appendix F, Table 12c). Recommendations ranged from hanging Marathon Kids posters and logs in the classroom, to displaying logs in the gyms and public hallways, to creating a 'wall of fame' of runners and a 'top 20 leaderboard'.

Social support for student runners. Another common best practice underscored by MK coach respondents was the importance of providing positive social support for student runners, including positive encouragement, instrumental support, and role modeling – key dimensions of social support cited in *social support theory* (Holt-Lunstad & Uchino, 2015) (Appendix F, Tables 13a&b). Specific recommendations for providing positive social support for student runners included:

- ✓ *Provide positive encouragement,* including providing positive motivation and cheering everyone on. Selected quotes from MK coaches included:
  - "Encourage kids to cheer on each other and not to treat it like a competition."
  - "I encourage [those] that aren't runners to walk then jog short distances until they build stamina and then jog for longer distances. I also run with my kids. It seems to really encourage them."

- ✓ *Provide praise and recognize & celebrate accomplishments*. Many coaches also emphasized the importance of recognizing and celebrating student accomplishments, both big and small, and for all runners- not just the most accomplished (Appendix F, Table 13a). MK coaches also shared recommendations for how one can recognize and celebrate student runners. Selected quotes illustrating this subtheme included:

> *"Figure out a way to praise all kids, not just the one who ran the most that day. I have a small running club, but I always try to give each child some type of complement that makes them want to keep coming back." –MK Coach, Finisher Survey*

- "I always recognize achievement in my gym regardless how small. Gains are gains!"
- "Figure out a way to praise all kids, not just the one who ran the most that day. I have a small running club, but I always try to give each child some type of compliment that makes them want to keep coming back."
- "Celebrate kids' successes in class and give them prizes for their commitment to completing a marathon."
- "Celebration at the end of the year!"
- "We have a runner of the week."
- "Discussing it during P.E. and recognizing students' efforts and achievements."
- "Announcing finishers at Student of the Month assemblies."
- "I give Marathon Kids rewards at assemblies so students are recognized in front of our staff and student population."

✓ *Provide instrumental support & role modeling.* In promoting instrumental and role modeling support, MK coaches also emphasized the importance of recruiting advocates for their club and their runners – including students, teachers and parents, as well as promoting participation of adults and the MK coaches in participating with students (Appendix F, Table 13b). Selected quotes illustrating these subthemes included:

"I enjoyed running with the students the best." –MK Coach, Finisher Survey

- "I encourage parents to attend. I run with them and some of their teachers do as well."
- "Adults modeling the club by participating. Older students coaching & motivating the younger students."

Positive philosophies for Marathon Kids running clubs. MK coach respondents shared a range of positive program philosophies and wisdom for implementing an MK running club (Appendix F, Tables 14a & 14b), with the following key subthemes identified:

✓ *Flexibility*: A common subtheme that emerged in MK coaches' best practices recommendations was the importance of maintaining flexibility in implementing one's running club, as summarized well by one MK coach: ""Be flexible and try to stay motivated to keep them motivated. It is worth it!"

✓ *Fun & excitement:* Many MK coaches touched on the importance of ensuring an element of fun and excitement in their running clubs. One MK coach emphasized: ""Add fun, focus and excitement to the program to motivate students", while another underscored: "Have fun!"

- ✓ *Goal setting:* Many MK coaches touched on goal setting as a key facet of the program, with some noting the importance of goal setting for beyond the duration of the program. One MK coach shared: “"Marathon Kids, for me, is a goal setting tool. As it progresses, it becomes competitive. In the end, it becomes a life-style. I want my kids to love running for life." Another MK coach recommended: “Allowing students to accomplish goals for themselves and then challenging themselves to achieve them."

> *“Make the mileage become a personal goal to achieve, not a competition to compare. I like to say: ‘'Every mile run is a mile further than you've gone before.’” –MK Coach, Finisher Survey*

- ✓ *Inclusivity*: Another common subtheme that emerged related to program philosophy as recommended by MK coaches was the importance of promoting inclusivity of students and not excluding anyone (Appendix F, Table 14b). Selected quotes illustrating this subtheme included:
  - "Being flexible and allowing all students to participate."
  - "Also being aware that all students are at different levels of physical fitness and not excluding anyone from that activity regardless of their ability."

> *“Create maximum opportunities for students of all abilities to be successful.’” –MK Coach, Finisher Survey*

- ✓ *Positivity:* MK coaches promoted the importance of staying positive for student runners, with one MK coach emphasizing: “Be positive….Stay positive!”.

- ✓ *Future Orientation and Life Skills:* As part of the running sessions, MK coaches recommended promoting subthemes related to future orientation and life skills, which included:
  - "Encourage growth and lifelong skills with participating in local runs."
  - "Talk about preparing for middle, high school or college sports."
  - "Getting the kids pumped up to travel to different destinations by using our imagination."

- ✓ *Various words of wisdom.* Lastly, MK coaches shared a range of rich recommendations for program philosophy and approach, including “teach with love” and "promising them that even if they can't complete a marathon, they are still winners for making the effort." (Appendix F, Table 14b).

Promotion and communication of Marathon Kids. MK coaches emphasized the importance of various communication approaches for students, parents and teachers for both logistical purposes for maintaining one's MK running club as well as promotional purposes to highlight student progress and celebrate student achievements (Appendix F, Table 15). One MK coach summarized well this theme: "Communication to students, parents and school staff is essential." Selected best practices identified included:

> *"Communication to students, parents and school staff is essential.'"*
> *–MK Coach, Finisher Survey*

- ✓ *Content-related recommendations for communication:*
  - "Announcing progress and achievements [of students]"
  - "Share photos of happy runners with parents"
  - "Presenting the benefits of running at a faculty meeting."
  - "Remind parents which days we meet."

- ✓ *Communication channel recommendations for promoting and coordinating Marathon Kids:*
  - School announcements
  - Facebook
  - Instagram
  - Class Dojo
  - Remind 101
  - Google classroom

Marathon Kids Events. Lastly, MK coach respondents promoted the importance of holding and participating in different types of school and community events as part of one's Marathon Kids running program (Appendix F, Table 16). Best practice recommendations included:

- ✓ *Hold a Marathon Kids "kick off" day.* One MK shared: "We have a huge kick of event in the fall and kids are really excited."
- ✓ *Designate specific 'themed days'* related to Marathon Kids ("Marathon Tee Day"; "Hosting special days like 'Marathon Day" or 'Fitness Fridays'").
- ✓ *Provide Marathon Kids challenges,* with one MK Coach sharing: "We do monthly challenges."
- ✓ *Celebrate milestones*.
- ✓ *Engage in community running-related events*. ""We also have 2-3 trail runs off campus that we invite families."
- ✓ *Hold a Marathon Kids "closing ceremony"* to celebrate runners and accomplishments.

> *"Hold a simple, but special closing ceremony to celebrate!'"*
> *–MK Coach, Finisher Survey*

Barriers for Implementation of Marathon Kids (Finisher Survey)

In exploring *barriers* for implementation Marathon Kids, MK Coaches (n=478) were asked using an open-ended response format: "Please tell us 3 barriers that make it difficult to implement Marathon Kids in your school." Box D presents a summary of the ten thematic *barrier* categories identified based on qualitative analysis; below we provide a summary description of these categories along with key subthemes.

Box D. *Barriers for Implementation of Marathon Kids* Thematic Categories - *Finisher Survey, Spring 2019*

1. Lack of Space/Track to Run
2. Lack of Resources for Students and Running Club
3. Time-Related Barriers (Time Constraints/ No Time Designated for Physical Activity/ Conflicts in Scheduling Time)
4. Lack of Administrative Support and Staff Involvement
5. Lack of Parent and Volunteer Involvement
6. Student Motivation, Attendance, Interest & Behaviors
7. Challenges with Tracking Miles
8. Funding-Related Barriers
9. Transportation
10. Weather

Lack of Space/Track to Run. A common barrier cited by MK coaches was the lack of space for their student runners to run (Appendix F, Table 17a), with one MK coach summarizing well this barrier: "I have no track, I have no track and I have no track... ☺". In addition to the lack of access or availability of a running track, other space-related barriers for implementing Marathon Kids included:

- ✓ Small campus size
- ✓ Lack of gym or size of gym, as well as "No indoor track for bad weather days."
- ✓ Lack of track or field close to campus
- ✓ Issues with the surface for running, included cracked playgrounds
- ✓ Surrounding traffic and 'rough neighborhood'

Lack of Resources for Students and Running Club. MK coaches also cited the lack of or low availability of resources for students and the overall running club (Appendix F, Table 17a), which included:

- ✓ *Lack of appropriate clothing and shoes for student runners*, with one MK coach commenting: "… we are a high needs school and many of our kids lack the proper running sneakers" and another stating: "Being a Title 1 school means that not all kids had shoes suited to running."
- ✓ *Need for healthy snacks.* Some MK coaches noted the need for healthy snacks, with one coach also noting: "Students come to practice hungry."
- ✓ *Need for water:* One MK coach also cited the lack of access to water as a key barrier.

Time-Related Barriers. Time-related issues were also commonly cited as a key barrier with implementation of Marathon Kids (Appendix F, Table 17b). In addition to the general theme of not

having enough time- which included specific time challenges for coaches who have other jobs and have their own families to attend to, MK coaches shared the following time-related barriers:

- ✓ "Teachers finding time during the day."
- ✓ "Not enough class time."
- ✓ Conflicts with scheduling time and competing interests, including: "School events, academic testing/tutoring" and "Flexibility and time management with the activities within the school."; "STAAR testing" and other test preparation; and "kids have lots of after school activities/sports".

Lack of Administrative Support and Staff Involvement. The lack of school administration support and staff involvement also emerged as a key barrier for implementation of Marathon Kids (Appendix F, Table 17c). In addition to general comments related to the lack of administration support, MK coaches cited: "Lack of teacher participation" and "Unmotivated teachers" as barriers for implementation. One MK coach shared: "Because I did it during PE class I did not have much help and it was difficult to keep up with it all."

Lack of Parent and Volunteer Involvement. In addition to challenges with administration and school staff support, MK coaches also noted the lack of parent and volunteer involvement as a barrier for Marathon Kids implementation (Appendix F, Table 17c). One coach shared that this lack of involvement presented challenges with growing the running club: "Having enough volunteers to help with the growing number of students who want to join."

Student Motivation, Attendance, Interest and Behaviors. While fewer responses were provided for this category, some MK coaches cited challenges with student motivation, attendance, general interest in running compared to other physical activities, as well as general "student behaviors" as other barriers with implementation of their MK running clubs (Appendix F, Table 17d). Of potential importance for Marathon Kids' curriculum planning, one MK coach shared: "Games don't resonate well with older kids." On a positive note in relation student interest, one MK coach commented: "So many students were interested, I was not able to have every one participate."

Challenges with Tracking Mileage. MK coaches cited several tracking-specific challenges (Appendix F, Table 17e), including:

- ✓ "Classroom teachers feel overwhelmed with mileage tracking (hard to remind t/o the year)" and "Teachers are busy and often forget to help track mileage"
- ✓ "We need more tracking devices" and "Digital logs would help"
- ✓ "Mileage logs are not kid friendly"
- ✓ "Having students log miles" and "Kids struggle self tracking during the day"
- ✓ "Parents log miles afterschool, not sure if they're doing it right"

Funding-Related Barriers. Several MK coaches noted the importance of providing financial support to implement their running club (Appendix F, Table 17f), especially for the low-income schools and areas, with one MK coach sharing: "Fundraising in a poverty area is not easy." Other coaches noted how the lack of funding kept them from allowing more students to participate: "Title 1 school with over half of our students from low-income households; …We had students that wanted to join our club but I had to turn them down because we only had 225 spots and those spots were gone in three days." On a related note, one MK coach shared: "We did not have funding or strong parent support for the kick off or finisher events." In summary, funding was identified as a key barrier for implementing Marathon Kids and expanding participation of students, especially for low-income populations, and continued support from Marathon Kids in terms of scholarships and rewards appear to be essential for many coaches.

Transportation. Another key 'social determinant'-related barrier for implementation of Marathon Kids was transportation (Appendix F, Table 17f). A common theme for transportation was challenges with providing transportation for afterschool programming, as summarized well by one MK coach: "some students cannot participate as we don't have bus service for after school programming."

Weather. Lastly, weather-related issues were cited as a barrier for implementation of MK running sessions, which included challenges with rain, hot weather, and cold weather and freezing temperatures (Appendix F, Table 17f).

Recommendations for Enhanced Support with Implementation of Marathon Kids (Finisher Survey)

Lastly, MK coaches (n=478) were asked to share their recommendations for enhanced support with their implementation of Marathon Kids running clubs based on the following question and corresponding open-ended response format: "Please share with us 3 ways we can better support you with implementing Marathon Kids." Box E presents a summary of the six thematic *recommendations for enhanced support* categories identified based on qualitative analysis. Below we provide a summary description of these categories along with key subthemes.

Box E. *Recommendations for Enhanced Support with Marathon Kids* Thematic Categories - *Finisher Survey, Spring 2019*

1. Provide digital tracking and online mileage log support
2. Make curriculum and resource enhancements
3. Consider different/additional student incentives
4. Continue funding support and consider enhanced funding support
5. Continue online support of MK Coaches and consider enhancing periodic check-ins.
6. Explore ways to enhance promotion and sharing of Marathon Kids (best practices, spotlight stories, community/volunteer involvement)

Provide digital tracking and online mileage log support. A common recommendation from MK coach respondents was to provide support with digital tracking of student miles, as well as provide online mileage logging support (Appendix F, Table 18a). A general recommendation that encapsulates this recommendation was as follows: ""Including more technology for the teachers to make program quicker to get the results for the students. If there was a way to print the results immediately it would keep them interested in finding out their weekly and total results." Additional selected quotes that summarize these recommendations include:

- ✓ "Lap App" and "An app for participants to log time and mileage"
- ✓ "A bar code and scanner that would track their laps and convert that to steps."
- ✓ "Providing digital Fitbit trackers"
- ✓ "Digital tracking for families"
- ✓ "A digital version of their log, which could be accessible at home and at school."

Make curriculum and resource enhancements. MK coaches provided various recommendations for enhancing Marathon Kids curricula and other resources, ranging from "more lesson plans"; to "better curriculum", "better games for 30 minute meetings", and "more games activities for rainy days"; to more posters, videos, and materials such as tracking logs; and more materials in Spanish. See Appendix F, Table 18b for rich recommendations for curricula and resource enhancements.

Consider different/additional student incentives. MK coach respondents also recommended consideration of different types of student incentives and rewards, as well as additional incentives (Appendix F, Table 18c). Selected quotes that illustrate these recommendations along with specific innovative recommendations include:

- ✓ *General request for more incentives* ("Other incentives"/ "Parent incentives"/ "more variety in the prizes."/ "More logo prizes"/ "stickers/car decals")
- ✓ *Nike shoes*: "Provide some Nike sneaker vouchers maybe" and "A program that would help some students get Nike Shoes. (I got kids who's shoes are falling apart and we are a low income school)."
- ✓ *Cheaper awards:* "Maybe cheapen the rewards so more students can participate. (charms or bracelets only for each marathon would cost $1 or $2 per student)"
- ✓ *Rewards throughout the year:* "A reward system throughout the year instead of at the end of the year."
- ✓ "More specific instructions about rewards..."

Continue funding support and consider enhanced funding support. MK coaches also commented on their interest in continued funding support as well as enhanced funding (Appendix F, Table 18d), as summarized well with the following quote from one MK coach: "continue sponsoring students and increase the number if possible." Another MK coach shared: "we are a title 1 school and the majority of our student cannot afford the t-shirt package [;] it would have been nice if we could have gotten more scholarships." The general interest in funding and support was encapsulated well by one MK coach: "Keep offering the grants!"

> *"Assistance with funding is always beneficial…and we appreciate it!'"*
> *–MK Coach, Finisher Survey*

Continue online support of Marathon Kids Coaches and consider enhancing periodic check-ins. Several MK coaches expressed appreciation for the overall support provided by MK staff, including the online support ("Continue with the emails and resources. Those were extremely helpful" and ""Keep coach's corner"). Beyond this appreciation for and interest in continued online support, MK coaches expressed interest in enhanced support via more periodic check-ins (e.g., "monthly encouragement and ideas", "Check in with us throughout the year", "I think more check-ins would be useful" and "Weekly/semi-weekly newsletters. (If you do this, I could have accidentally opted out)" as well as interpersonal support ("Be assigned person from Marathon Kids that we could have as a mentor that we could talk over the phone with" and "School visits"). (Appendix F, Table 18d).

Explore ways to enhance promotion and sharing of Marathon Kids. Lastly, MK coach respondents recommended exploring further ways to enhance promotion and sharing of Marathon kids, including exchange of best practices, providing spotlight stories, and community/volunteer involvement (Appendix F, Table 18e). Selected quotes and innovative recommendations included:

- ✓ *General promotion*: "Continue to give us information to share with families and maybe newsletters (even if they are brief, they can be added to existing letters going home)" and "A short movie trailer that highlights what Marathon Kids is all about for students and staff."
- ✓ *Best practices*: " a local Facebook or social media support group would be nice, so that local schools can share ideas" and "Share stories/ideas from other schools/coaches"
- ✓ *Spotlighting*: "A runner of the week frame to highlight students"; and "Provide inspiring videos on your site."
- ✓ *Community/volunteer involvement*: "Suggestions to get the community/family involved and engaged," and "Have a local kick-off rally with other schools in the area."

Star Coach Interviews

Our final assessment for this Marathon Kids Pilot Study consisted of conducting six in-depth qualitative interviews with 'high performing' Marathon Kids coaches recommended to us by our Marathon Kids colleagues. The aim of the interview was identify additional best practice recommendations for implementing Marathon Kids. The interviews took between 30 and 45 minutes to implement, and covered a range of topics as present below.

The "Marathon Kids Star Coach" respondents (n=6) were all based in Texas, with four based in Austin and the other two based in the broader central Texas area. Of the six respondents, n=4 were female, and n=5 worked at public schools and n=1 worked at a private school. Teaching experience ranged from 3 to 24 years. Most respondents had between 3 and 4 years of experience working with the Marathon Kids program, with one respondent reporting approximately 20 years of experience. (Appendix G, Table 1). The MK Star Coaches represented a variety of implementation models, which included before school implementation (n=1 coach), during school, with an emphasis on running time during class and recess (n=2); after school (n=1); and full campus implementation, which included before, during and after school (n=1). (Appendix G, Table 2).

Top Best Practice Recommendations

At the end of the interview, we asked MK Star Coach respondents to summarize their top best practice recommendations in response to the open-ended question: "Based on our discussion above, could you share with us your three best practices for implementing Marathon Kids? What works for your school/Marathon Kids club that might be helpful for other Marathon Kids' coaches?" Appendix G, Table 3 presents the direct quotes from respondents. Below, we share a summary of the top best practice recommendations for implementing Marathon Kids as cited by respondents:

1.) *Positive encouragement, motivation and overall social support:* A key theme across MK Star Coaches was the importance of providing positive encouragement, motivation and overall social support, which includes verbal encouragement as well as instrumental support by participating with student runners. One MK Star Coach shared: "I praise the kids, I participate with them, and I talk to them- they see me ride my bicycle to school, too, so they get motivated. So, praise, full participation, and the rewards that they get - the Marathon Kids prizes. Because on a daily basis, they want to hear the praise, and then they're all so happy to achieve the goal at the end."

2.) *Communication*: MK Star Coaches also underscored the importance of constant communication about one's MK running club with key program stakeholders. One MK Star Coach shared: "…Communication- getting it out, letting people know about it, whether that's through the email, newsletter, or… a fall picnic or event where you have a table set

up, and then talking to the kids about it through PE…". Another MK Star Coach recommended: "And continuously talk about it [the MK program] at your campus."

3.) *Consistency*: Two of the MK Star Coaches also underscored the importance of consistency and follow-through with one's running club, which includes keeping constant the days and times that running club is scheduled as well as consistency with communication. One MK Star Coach shared: "I would keep it consistent, like if you're doing it on Fridays, do it on every Friday, try not to cancel because once they get into a routine- like, those kids will be dropped off every time at the right time. They won't ever forget to come. So, if kids always know what to expect ahead of time, that Friday mornings is running club, it just becomes routine. So, I would keep it consistent with your time."

4.) *Inclusivity*: MK Star Coaches also emphasized the importance of inclusivity and making one's running club open to all, with one coach underscoring: "I would make it [the running club] available to everybody."

5.) *Train Your Teachers.* One MK coach recommended the importance of training one's teachers in the system and approach one is using for a campus-wide implementation, sharing: ""Train your teachers early. Make sure they are trained on how you want your program to run."

6.) *Digital/Electronic Tracking:* While MK Star Coaches shared different approaches for tracking-including traditional approaches, a top recommendation that relates to MK coach input from the Finisher Survey was to consider a digital or electronic approach for tracking miles. One MK Star Coach shared: "I personally won't go back to the paper tracking of the miles because kids lose their papers too easily. I go electronically all the way and whatever way that works best for you. There's several different apps out there."

7.) *Rewards & Incentives:* Related to the above topic of motivation and social support, MK Star Coaches recognized the importance of providing some extrinsic motivation for their student runners. One MK Star Coach recommended: "…incentivizing it [the running/participation in running club] by showing them the incentives and what they can get and how they can feel." In providing this extrinsic motivation, one MK coach emphasized the importance of having the lead coach or PE teacher hold on to the rewards instead of giving to teachers at the beginning of the year (for those schools doing campus-wide implementation), and then providing the awards in a more thoughtful way at the end of the year. Lastly, MK coaches recognized that there are other ways to incentivize and motivate beyond rewards, with one coach recommending: "…incentivizing them by letting them meet like some, not famous runner, but like a really good and experienced runner…"

8.) *"Excitement in Everything:"* Lastly- and related to the first recommendation, MK Star Coaches emphasized the importance of one's own attitude as a coach and one's ability to inject excitement and fun into one's running program. One MK Star Coach shared: "I used to coach, and so I always realized that during a game if my student, if my player felt defeated most of the time, it's because that was what I was displaying. And so I think excitement, that if we're really excited about it, and we're consistent with communication, then those three things [consistency, communication, and excitement in everything] will always give a positive outcome…It's not going to completely change everything, but that kind of sets you up for the best implementation."

Additional Recommendations for Implementation of Specific Facets of Marathon Kids

Tables 4 through 8 in Appendix G present valuable input from the MK Star Coaches on specific facets of MK implementation. Below, we provide a summary of key best practice recommendations for these various facets of Marathon Kids program implementation.

Recruitment & Promotion: MK Star Coaches shared common ways they recruit students into their MK running clubs (Appendix G, Table 4), which included:

- ✓ *School announcements, newsletters, flyers, and information sent home via parent folders.*
- ✓ *Providing registration form online.*
- ✓ *Word-of-mouth and Face-to-Face-* with specific promotion of the running clubs via PE class and directly with parents.

> *"So, I still promote for a week after in PE, and I always have extra flyers because sometimes parents don't check their kid's folders, and kids will forget what's in them." –MK Star Coach*

> *"We just explain how much fun it is, what you get out of it, [and] what your brain looks like before and after your running." –MK Star Coach*

Communication: Several best practice recommendations were shared by MK Star Coaches related to general communication, parent communication and teacher communication (Appendix G, Tables 5a-c), including:

- ✓ *Facebook and Twitter.* Some Star Coaches shared that they have their own Facebook and Twitter; others shared that they used their schools platforms to promote and communicate about Marathon Kids. One MK Start Coach shared: "…Our school, our district is a real big Twitter district. And so .. I'll tag out school and our district, and then those people will catch that. …[I]f we have big rewards and stuff that we've done, like the first person that finishes a marathon, …we'll post their picture on the school's Facebook page.."

- ✓ *Email, Letters Home to Parents, Remind 101 & ClassDojo:* Email was a popularly cited way of communicated with parents and teachers. A more innovative approach was the use of Remind 101, described well by one MK Star Coach: "…we use a Remind 101….It's just a digital communication so you don't have to use your cell phone all the time. A lot of teachers use it for classrooms. I have a Marathon Kids one, so all the parents- I can send out and remind them about Marathon Kids Day or they can ask questions. ..So that way, you can constantly- the parents can just ask questions. It's not through the phone; it's an app. …But it's a little easier than email." ClassDojo was cited as another recommended approach for teacher/parent communication.

- ✓ *Face-To-Face*: While coaches commonly cited electronic forms of communication, coaches also underscored the importance of face-to-face communication: "Yeah, I like having the real conversation with them [parents] just because we live in such an over digitalized world that sometimes the more meaningful conversation is person, and so I try to have that as much as I can. But the kids that ride a bus, I don't get to see their parents as often, so I still have to use electronic."

- ✓ *Back-to-School Night & Faculty Meetings*: MK Star Coaches also cited in-person meetings and events as important opportunities for communicating with parents, students and teachers, including back-to-school night (parents and students) and staff meetings (teachers).

- ✓ *Newsletters, Weekly Updates & Posters*: Other forms of communication included citing and promoting Marathon Kids via school newsletters and campus updates, as well as within the school via posters and other promotional postings such as mileage trackers.

Tracking and Logging Miles. MK Star Coaches discussed different ways they approach tracking (Appendix G, Table 6), with four key approaches cited as follows:

- ✓ *Digital/Electronic Tracking and Logging*: MK Star Coaches emphasized how helpful digital/electronic tracking and logging is, with one coach sharing: "We use EZ Scan…. Any of them would be fine, that's just the one our PTO pays for our membership for the school, and that's the one…we already have a relationship with." Another shared:

> …students individually track. Teachers keep up with it through…Fitness Finders, and it's a program called EZScanner, EZ Tally. And so each of our classroom…teachers on campus ..have their own log in. So when the kids run the track, any teacher can scan a kid's card with a phone or an IPad. So they have their own devices because it's their own phone or their IPad that they have. And when the teachers can pull up the whole class list and see which students has- how - what mile… Actually, the EZ Scan/ EZ Tally is what kept all of our mileage and the kids loved it… Our campus has gone over 51,000 miles this school year. It's amazing. They love it. –*MK Star Coach*

- ✓ *Traditional Paper Tracking with Electronic Logging*: Some MK Star Coaches report good experiences with the paper tracking log, and then add in an online spreadsheet for recording miles. One MK Star Coach shared:

  > The paper log, yes, and then I did add a Google Doc- Google Spreadsheet that the families had access to and they were supposed to go in there and put the mileage every week or two- however often they wanted to go in and put the mileage in and I told them that was so I could see where they were. I could encourage them, I could say "Oh I see you've finished 10 miles, awesome!" or, "I see you've earned your incentives, here you go, congratulations!" So that was how I kept up with it was through that spreadsheet. *–MK Star Coach*

- ✓ *Public Posting of Miles*: C common approach recommended by MK Star Coaches was to post their student runners' miles walked or run in different places (hallways, classrooms, PE class) and in creative ways, ranging from the U.S. "Running Across the Nation" Map provided by Marathon Kids to other home-made tracking posters.

- ✓ *Incorporation of Marathon Kids Goals into other Campus Goals:* Of note, one MK coach shared how they incorporate the miles walked/run into other campus goal setting for other initiatives. One MK Star Coach shared: "…And we're also trying to get "lighthouse' status for Leader and Me, and so we follow the 7 habits of our WIG (WIG is Wildly Important Goal)- we tie running into the Fitness Gram for the Pacer. And so, we're talking about how many laps we run at Marathon Kids on Friday morning…"

Positive Reinforcement. As cited above in the 'top best practices', a common best practice was providing positive reinforcement for student runners (Appendix G, Table 7), with best practices that included:

- ✓ *Providing constant verbal praise and social support* for achievements of students. One MK Star Coach shared: "I do it [Marathon Kids program] with them. Every 9 weeks, I go outside with them and I challenge them, …if you can beat the coach, and I also praise the kids on a regular basis during PE class. If they' done their laps, I'll ask about them."

- ✓ *Providing encouragement via allowing students to see the miles run/walked* via systems such as EZScan.

- ✓ *Providing rewards and incentives*.

Marathon Kids Events. MK Star Coaches shared different ways the promote and celebrate student runners and the Marathon Kids program, including holding of kick-off events, final mile/finisher celebrations, scheduling specific "Marathon Kids" days (see accompanying quote), and incorporating Marathon Kids into existing awards ceremonies (Appendix G, Table 8). One MK Star Coach described his/her school's approach:

> *"…Our assistant principal came up with this: on the 26gh of every month is Marathon Kids day. So we wear t-shirts, even the staff. They get to wear Marathon Kids t-shirts and jeans on that day, and the students wear it. So, we have one of those every month." –MK Star Coach*

> So, we have a kick off…We had a lot of parent volunteers out and I put some cones out on the track with those flags, like party flags, lined up and down the cones, just to make it a big deal. And so, we had music out there- art, music, and PE were out there with the whole grade level at a time….Just making it fun for them. The music helps and all the encouragement and seeing how many checks they have on their hand and so, that's a big deal…. Just kind of like an uplifting, positive environment. *–MK Star Coach.*

Positive Program Philosophy: Importantly, MK Star Coaches touched on different ways they promote a positive program philosophy for their student runners, and in some cases, for their entire school culture (Appendix G, Table 9). Below, we share encouraging ways two of the MK Star Coaches promote a positive philosophy and culture via their work with Marathon Kids:

> And I really try..to make Marathon Kids the driving factor of our school culture. Because that's the one thing that fits into our school that everyone else does. That's the one common denominator outside of the classroom is everyone does Marathon Kids. So I want to be the driving narrative that we have and I think so far it's worked. The campus people that come, like the superintendent, when he comes he always comments on how your kids look different, they look like they're healthy, they look more confident, and I think that just everywhere they go, every hallway, there's some sort of Marathon Kids Mileage Log. There there's a ton of signage on the walls that help create that narrative.

> I think if you're doing just in general, not necessarily campus wide, but I think the way we talk about it helps a lot. So, it's always we get to do this, not have to do this, or we're not going to do this, we get to do this. I'm trying- because if you get to do something, it's a positive. So, we get to run extra, we get to run during the day and take and extra time. And I use that every time I communicate with parents or children about the program. It's always well, we get to do this at [school name removed]. While I think that just helps set that positive, and it's nothing you have to create; it's just doing a different word. I didn't do that the first year that we did it, then I changed the year after, and I saw this huge overall buy-in because it was hey, we get to do something that not everyone else gets to do….*–MK Star Coach.*

Another MK Star Coach discussed the importance of MK running club as a vehicle to connect further with students:

> …I've gotten to know kids better also [via Marathon Kids]- you know, because our classes are huge in PE, because we are such a big school, I could have 75 kids at one time. And that's one of the things I hate because I never get a chance to get to know them, get to talk to them…..So having a running club kinda gives you a chance to run with certain students, too, you know, gives you a chance to get to know them better- I mean, but that's an investment and part of us doing that is it helps us with behaviors. We have a lot of behaviors at our school, a lot of students in crisis, and the way to honestly help them is getting to know them and building that relationship, and it takes time. So running club has been good in that aspect. *–MK Star Coach*

Recommendations for Support of Marathon Kids Coaches

Lastly, we asked MK Star Coaches to share ways that they can be better supported with their role as a Marathon Kids coach in response to the open-ended question: "Please share with us 3 ways we can better support you with implementing Marathon Kids." Appendix G, Table 10 presents a summary of the input from MK Star Coaches. In general, MK Star Coaches had few recommendations, with most recognizing the invaluable role and support that they are currently receiving from Marathon Kids staff, with MK Star Coaches stating "…I think they [MK staff] do enough…", to "They're doing such a great job…", to "Keep it simple. I mean, I love the way y'all have it now." Among the few recommendations, MK Star Coaches recommended:

- ✓ Some sort of online registration
- ✓ Having more awards, which may include providing 'stock card' certificates of recognition/completion
- ✓ Allow classroom teachers to order their own awards/prizes
- ✓ Hold a city-wide event "…so that we can meet other Marathon Kids in the community."
- ✓ Continue to provide periodic check-ins and emails with success stories and tips

These important recommendations notwithstanding, we end with encouraging compliments for Marathon Kids from two MK Star Coaches:

> I just think it's a great company. I think they're all great people that work there, and everybody should do it [MK]. I mean, I love the fact that it doesn't cost anything because, back, I don't know how many years ago, our other school, they had to pay for it. They had to opt in and pay for it. So, if you're in AISD, it's covered by people and donations…. I just think it's an amazing program. There's so many benefits for it, and I'm glad that we're still keeping it and doing it. *–MK Star Coach*

> …I think they do a great job. And part of that… just that every time I've had a question and I've emailed a question, I've always gotten a direct and quick response… So they've always been incredibly helpful about answering questions. Or if the person I email wasn't the right person, they immediately copy the right person. So I think that's something- I don't know if they can do anything better, because they already do a pretty good job at communicating. *–MK Star Coach*

Discussion

This pilot study of Marathon Kids aimed to generate insights about the short-term effects of participation in Marathon Kids on elementary school-aged children's physical activity and related factors compared to school-aged children without access to the Marathon Kids program. An additional objective was to explore current approaches for the delivery of Marathon Kids, including best practices for Marathon Kids as shared by Marathon Kids coaches from Texas and across the U.S. Findings from three primary studies (a matched comparison group, pretest/posttest study (n=6 schools); a Marathon Kids Coach Finisher Survey (n=478 coaches), and a Marathon Kids Star Coach in-depth interview study (n=6 MK coaches) indicate a number of promising best practices for delivery of Marathon Kids, documented reach and implementation-related impact of program based on MK coach report, as well as opportunities for further enhancement of delivery based on our small pilot study of six schools. Below, we summarize and discuss key findings from these three studies and present recommendations for next steps.

Matched Comparison Group Pilot Study (Study #1)

In assessing the short-term effects of Marathon Kids on elementary school children's physical activity, we compared physical activity levels (obtained via participant report and accelerometry) and self-reported intrapersonal factors (e.g., athletic identity, physical activity self-efficacy) between central Texas 3rd-5th grade students attending schools (n=3) implementing Marathon Kids with students in three schools from a neighboring school district that were not implementing the program, with measures taken primarily in fall 2018 (baseline) and spring 2019. Key findings from this small pilot study included:

- Students engaged in relatively high average daily minutes of accumulated MVPA (an average of 52.3 and 56.9 minutes per day across the measurement periods for MK and comparison groups, respectively).

- Roughly one out of three study participants met guidelines of 60 minutes of daily aerobic, moderate to vigorous intensity physical activity based on accelerometer assessment (32.8% of MK students and 38.0% of comparison students), underscoring an important opportunity to further support children's physical activity to increase overall prevalence of meeting these public health recommendations for general health and well-being.

- Students attending Marathon Kids schools did not differ from students attending comparison schools at posttest for moderate to vigorous intensity physical activity (quantified by either participant report or accelerometry) or physical activity-related intrapersonal outcomes (athletic identity self-concept, outcome expectations for physical activity, perceived enjoyment of physical activity, perceived running enjoyment, perceived walking enjoyment, barrier PA self-efficacy*)* in unadjusted or adjusted analyses.

While the lack of intervention effects found for the Marathon Kids program in this pilot study was unexpected, we feel these findings offer important insights for the delivery of Marathon Kids as well as future intervention research with the program. To provide context to these underlying findings showing no differences between study groups, we share the following considerations:

1. *Similar or increased opportunities for physical activity engagement in comparison schools*. Despite positive implementation impact findings of MK that included high completion of marathons by students (85% completed 1 or more; 62% completed two or more marathons over school year) and overall high student ratings of MK, comparison schools provided similar or increased opportunities for physical activity engagement. These opportunities included a higher weekly number of opportunity minutes for students to run and walk in comparison schools (291.7-345.0 weekly minutes) compared to intervention schools (193.3-200.0 weekly minutes); an average of 2-3 days of physical education class per week, with an average of 55 minutes scheduled per class, compared to 2 times per week for MK schools- with an average of 45 minutes scheduled per class; as well as implementation of one running club in the comparison school and tracking of miles run/walked in all comparison schools- key facets of the MK model.

   Given the variety of physical activity opportunities offered in each school as well as the provision of support with tracking of miles walked or run in comparison schools, it is possible that the lack of differences found in the *matched comparison group pilot study* was due to both structural differences (i.e., increased PE in comparison schools) as well as similarity of activities. With regard to similarity activities (e.g., tracking of miles), we cannot rule out that comparison schools were motivated to provide more minutes of physical activity given their expressed interest to participate in Marathon Kids, as well as a possible 'residual' effect in which PE teachers continued to implement some of the same practices of Marathon Kids, such as tracking of miles, based on the school district's previous involvement with Marathon Kids. While efforts were made to match schools to the extent possible on demographic characteristics, future research efforts need to consider structural differences in provision of physical activity between schools. Ideally, future research should include schools from the same school district that can be randomized to intervention or comparison conditions- an approach that was not possible for the current study.

2. *High levels of daily accumulated moderate to vigorous intensity physical activity.* Second, while the estimates of accumulated moderate to vigorous intensity physical activity in sustained bouts (≥ 8 minutes) was quite low given the focus on sustained running in Marathon Kids- which points to the opportunity for increasing program impact, the overall average daily minutes of detected moderate to vigorous intensity physical activity were relatively high (52.3 minutes and 56.9 minutes for MK and comparison schools, respectively, averaged across measurement periods) . Data from the National Health and Nutrition Examination Survey (NHANES), a U.S. based surveillance system, found that students aged 6-11 years had, on average, 88 daily

minutes of MVPA (Belcher et al., 2010), which suggests room for improvement for students engaging in Marathon Kids. On the other hand, a recent study of 1st-3rd grade children in the U.S. found that students accumulated 30.4 and 34.4 minutes/day of MVPA during PE school days, and between 23.5 and 27.3 minutes/day of MVPA during non-school days, for girls and boys respectively (Weaver et al., 2016). As such, it is possible that schools from both school districts were delivering a high number of minutes of physical activity minutes, with Marathon Kids contributing minutes to MK schools, while other strategies were delivering minutes to comparison schools. The high observed minutes of accumulated MVPA in our pilot study in both study conditions, yet underperformance for meeting the 60 minute recommendation, suggest the opportunity for enhanced strategies to further increase accumulated MVPA levels to ensure the daily recommendation of 60 minutes per day is met, particularly during week days. The Marathon Kids program can also set the foundation for healthy habits that contribute to meeting daily recommendations for moderate to vigorous intensity physical activity on weekend days, too.

3. *Evaluation of the program 'as is'.* Findings of this pilot study should be interpreted within the context of this research as an exploratory study intended to provide initial data to better understand current physical activity levels of children as well as delivery approaches for the program. The program was evaluated 'as is', with no additional support or trainings provided to intervention schools for implementation of Marathon Kids. We were intentional with our framing of this study as a small pilot study, with a limited sample size, to provide practical recommendations to further fine-tune the Marathon Kids program prior to a larger trial.

4. *Need to explore further the conceptual model and the delivery of MK.* Fourth, it is possible that the dose of delivery of Marathon Kids was not sufficient based on the current program model to show differences with the comparison schools, and/or that the program was not implemented fully. In exploring this first point, we note the different models of Marathon Kids, which include school-wide implementation- with implementation via PE teacher or classroom teacher, before and after school implementation, and other models (e.g., implementation at home). School-wide implementation has both advantages, which include reaching all students, and disadvantages, which may include a lower dose of delivery as compared to an afterschool running club, which may offer added minutes of MVPA outside of school while also providing the opportunity for further 'affinity' with a smaller group of students and 'identity' as a runner. Our study focused on a school-wide implementation in which classroom teachers implemented the program. As such, it is possible that the dose provided by teachers (e.g., running a certain number of laps) was not sufficient to show differences with comparison schools. In this case, the conceptual model may need further enhancement in order to increase the frequency of times for walking and running and/or the intensity of walking and running during a given session and across the school setting (see Star Interview findings above regarding inspiring best

practices for "full" school implementation that can include school-wide as well as before and after school implementation of running clubs).

A second consideration of program delivery has to do with the program not being fully delivered, which is classified in research as a "Type III error". As such, the program strategies may be efficacious, but teachers may not be fully implementing the model. While some concerns were expressed by MK coaches regarding their inability to obligate classroom teachers to implement MK, as well as concerns with lack of administration support in some schools, we found an overall high rate of marathons completed, with 85% of students indicated completion of 1 or more marathons, and 62% indicating two or more. Students also reported a high overall satisfaction with participation in the program.

A third consideration with implementation is that schools are implementing in different ways. Research has found that using a standardized PE curriculum that can further guide PE teachers results in more MVPA during PE class (SHAPE, 2015). To this point, a recommendation from our MK coaches stemming from our process evaluation and end-of-year interview was to provide "beginning of the year *tips/bullet points* for implementing the program." While MK coaches in the comparison group study provided high praise for MK staff, school district leadership with the program, and with the overall program, they also shared that they were not familiar with many of the MK resources, which may be another point to explore for future communication efforts with MK coaches that can enhance delivery (see process evaluation section above for other recommendations).

5. *Limitations with evaluation approach*. Lastly, our study, like all studies, has specific limitations with the evaluation approach that merit mention. First, as this was a pilot study, we were limited with the sample size of schools and students. Pilot studies are often underpowered, which is often why statistical significance is not highlighted in findings of pilot studies, but rather attempts are made to characterize the direction of findings. For the present study and based on estimates provided, we do not expect a larger sample to have changed the null findings. Second, pilot studies with small samples may also be prone to issues of representativeness and selection biases in which students do not represent the broader population from which they are selected. While our overall response rate of 34% is in line with other studies that use an active parental consent procedure (Horn et al, 2009; Tigges, 2003), we cannot rule out a selection bias in which participants are different than those not participating in the evaluation based on the small sample and response rate. This limitation notwithstanding, we suspect that participants in the study may be more inclined to physical activity than less, which presents a conservative bias in favor of the program.

   Third, we have to consider the comparability of the intervention and comparison groups. While we attempted to match schools on socio-demographic factors, there were important

differences worth noting, which include a higher economic disadvantage rate for intervention schools (82.9% vs. 71.5% for comparison schools) as well as differences in gender composition (64.2% vs. 52.1% composition of girls for intervention and comparison schools, respectively). As physical activity has been found to differ for boys and girls, with boys engaging in higher levels of activity (NPAP, 2018), the higher composition of girls in the intervention school sample may have resulted in lower MVPA. In addressing this limitation, we adjusted for gender as well as ethnicity in the analyses. Nonetheless, we cannot completely rule out the effects of gender on findings. Furthermore, as cited above, it is possible that schools in the two study conditions were not sufficiently comparable based on differences in the scheduling of PA opportunities.

Fourth, we must also explore the measures used as well as the timing of administration of the measures. Arguably, a key strength of this study was the use of multiple measures to quantify physical activity, including accelerometry and a reliable and valid self-report measures (PAQ-C) (Crocker et al., 1997; Kowalski et al., 1997; Janz et al., 2008). Similarly, our intrapersonal measures of physical activity have been widely used and have also shown evidence of association with physical activity (Saunders et al., 1997; Anderson et al., 2009; Dishman et al., 2009; Klesges et al., 2010). While all measure have their limitations- which may include social desirability bias, we expect the biases associated with these measures to be equally distributed across the study groups. The triangulation of similar findings (statistically null findings) across the measures also provides more confidence in our conclusion of no difference.

Lastly, it is important to note the short time period between pretest and posttest. As school approvals and recruitment of schools took longer than expected, we were not able to implement the pretest until November 2018, with two of the schools assessed in January 2019. While schools were assessed in pairs (one intervention and one comparison) to rule out seasonality-related biases, the short time frame between pretest and posttest (which began in March 2019) may have not been long enough to allow for changes between pretest and posttest. Similarly, the pretest may have not captured a true 'baseline' given its start date in November. These limitations notwithstanding, the lack of differences between intervention and comparison group at each time period suggest that using a posttest only evaluation design, in which pretest is combined with posttest scores, would still result in no differences found between intervention and comparison groups.

Marathon Kids Coach Finisher Survey (Study #2) & Marathon Kids Star Coach Interview (Study #3)

The Marathon Kids Coach Finisher Survey and Marathon Kids Star Coach Interview documented a range of positive findings for Marathon Kids' mission of promoting physical activity. Key findings from these studies included:

- A *high reach of the Marathon Kids program* across the United States (n=65,163 children in grades 1st through 12 reached from across 35 states in the U.S.).

- *Positive impact on delivery of children's physical activity* as assessed by *marathons completed*, with MK coaches reporting 86.4% of student participants having completed ≥ 1 marathon, with just under half (49%) completing ≥3 (the equivalent of 78.6 miles walked or run during the course of the school year).

- *Positive impact on delivery of children's physical activity* as assessed by *minutes scheduled*, with MK coaches reporting an average of 112 minutes provided during the school week, representing an average of 22.4 daily minutes of walking/running delivered via the Marathon Kids program.

- *High satisfaction of MK coaches* with the Marathon Kids program based on a composite satisfaction score that includes items such as "I enjoyed doing MK very much this year" and "I would recommend MK to a friend/colleague" (mean MK satisfaction score of 50.6, with 56 representing the highest possible score).

- *High satisfaction with support received by MK coaches from MK staff.*

- *Identification of a range of innovative and promising best practices for implementing Marathon Kids for various facets of program implementation,* including: general organization and planning, student recruitment, club approach and activities, tracking and logging miles, and promotion and communication approach.

- *In-depth insights about different models and philosophies of MK implementation.*

These findings underscore the collective impact MK is creating to promote young people's physical activity via walking and running, both across the before, during and afterschool context, as well as across the U.S. via the multitude of clubs and schools implementing MK. Our findings also emphasize the rich community and eco-system Marathon Kids is nurturing as demonstrated by the innovative best practices MK coaches are developing around MK's foundational 'pillars' of *goal setting, tracking, modeling and social support,* and *rewarding and celebrating achievements*.

An important overall finding from our work with the *matched comparison group pilot study* and the *Marathon Kids Coach Finisher Survey* and *Marathon Kids Star Coach Interview* is that there

are multiple models and best practices currently being implemented with the Marathon Kids program, which we consider a true strength of the program. A take-away message for our evaluation team is that each model (e.g., 'stand alone running clubs', before school, after school, and school-wide, among others) merits further exploration and conceptualization to understand unique differences, strengths, best practices and limitations.

In exploring further the different models, findings from the *Finisher Survey* and *Star Coach Interview* provide multiple perspectives for best practices as informed by MK coaches. While standardization of program delivery is a consideration in conducting future research to test the efficacy of a given model, we argue that the current diverse eco-system of Marathon Kids program implementation is a true strength of the program, which includes geographic diversity of Marathon Kids being implemented across the U.S., diversity across contexts (before, after and during school as well as community-based and home-based programs), and diversity in innovative approaches for implementation.

Three concepts from the implementation science and complex adaptive systems literature that may be helpful for Marathon Kids in further conceptualizing its program implementation approach are: 1.) *a new conceptualization of fidelity (function vs. form)*; 2.) *elasticity and plasticity*; and 3.) *agency and 'indigenous knowledge'*.

Fidelity under a traditional program evaluation would focus on keeping constant the delivery of the intervention across different study sites, yet this approach does not take into consideration the uniqueness of different schools or afterschool programs, among other factors. In response, Hawe et al. (2007) recommend a refined conceptualization of fidelity, one in which the function of the intervention (e.g., delivering a certain amount or minutes of MVPA) is more important than the form, which may vary depending on the school or afterschool context. As we learned from the rich open-ended responses from the Finisher Survey and Star Coach Interview, there are many promising yet diverse ways MK coaches are currently tracking miles; providing positive reinforcement, social support and rewards; and delivering the actual running program, among other facets of program delivery. We recognize these differences as a strength of Marathon Kids and the MK community. While standardization may be helpful for research- and for ensuring efficacy of one's program, we recommend continual exploration of the 'active ingredients' of the program model- which can provide this standardization. The active ingredients may likely be rooted in the six 'pillars' of the Marathon Kids program *(goal setting, tracking, modeling the way, social support, celebrating, and rewards)*. The best practices identified in this study can further contribute to operationalizing these pillars as well as the different program models, which can in turn form the basis of the 'active ingredients' for the Marathon Kids program that can increase program impact.

Related to this *new conceptualization of program fidelity*, MK program planners may also consider the concepts of *elasticity* (how elastic or changeable one's program context is to allow for

new programs), as well as *plasticity*, or how malleable a given program is to be easily molded into a given setting (May et al., 2016; Hawe, 2015). We continue to cite the simplicity of the Marathon Kids program model and six pillars as a strength, which may allow for higher 'plasticity' that can result in better implementation as well as innovation, as documented in our qualitative findings.

Lastly, findings from our qualitative analysis of the MK Coach Finisher Survey and Star Coach Interview data underscore the strength of 'indigenous knowledge' and 'local agency' of the Marathon Kids coaches. Hawe (2015) provides a strong critique of our traditional public health intervention 'pipeline of knowledge production' approach in which a researcher has a brilliant idea, tests that idea under efficacy studies, and then disseminates that idea via effectiveness ('real world') and dissemination research. In her paper, Hawe argues for a 'bottom up' or indigenous knowledge production approach in which researchers approach people in settings with the idea that there are 'thinking people' who know best their settings, and that co-learning is needed for developing efficacious interventions and programs. The findings shared in this report from our Finisher Survey and Star Interview analyses underscore the power of indigenous knowledge production and 'agency' from Marathon Kids coaches to develop innovative approaches for their settings and populations. While opportunity exists to further glean and refine best practices noted in this report, we encourage Marathon Kids to continue forward in nurturing a robust and diverse eco-system of approaches for implementing Marathon Kids, while always maintaining the 'active ingredients' that provide the foundation of the program.

Recommendations

In this last section, we share selected recommendations for Marathon Kids program staff regarding how to build from the findings of this report. We do not go into depth here about specific recommendations for the overall program or program delivery in order to not duplicate recommendations noted within the report.

1. *Explore further the barriers, best practices, and recommendations for enhancement provided in this report with the aim of ongoing fine-tuning of the Marathon Kids framework*. While we present a range of findings in this report, we feel Marathon Kids team and stakeholders are in the best position to glean key findings for program enhancement. In doing so, Marathon Kids may consider engaging in a participatory planning approach with their staff and other stakeholders (MK coaches, district leaders) to further review and identify key findings for specific facets of the program that can inform ongoing program refinement.
2. *Clearly identify the different program models for Marathon Kids program delivery*. As noted above- and as recognized by MK staff, there are currently multiple models for implementation of Marathon Kids. Further identification and description of each model holds promise in terms of identifying best practices, strengths, and limitations. We recommend the creation of a logic model for each model in order to spell out program

inputs, outputs, and outcomes. A 'community facilitated logic model' in which program stakeholders are convened to collectively create a program logic model, as promoted by groups such as the Healthy Wisconsin Leadership Institute (HWLI, 2019), may be fruitful for generating specific models for each program while fostering further ownership among the Marathon Kids community.

3. *Explore ways to further disseminate best practices identified by Marathon Kids Coaches.* We have aimed to highlight best practices identified by MK coaches throughout this report, which we feel hold promise for increasing the effectiveness of Marathon Kids. Once program models are further conceptualized as per our second point above, we recommend exploration of platforms and opportunities for further sharing these best practices (e.g., website, Leadership Academy, newsletters, among other ways).

4. *Continue to refine approaches for ensuring program delivery and impact.* Given our null findings from the pilot study, we see opportunity for further enhancement of the program model and delivery, at least as pertains to the school-wide/classroom teacher implementation approach. As only approximately one-third of student participants were meeting physical activity guidelines of 60 minutes of daily physical activity, this study also documented an important need for enhanced intervention efforts to promote physical activity with young people. The rich best practices and insights provided by Marathon Kids coaches in this report can directly inform Marathon Kids program approaches *(e.g., recruitment of teachers and students into program, digital tracking, scheduling of time for PA, enlisting parent support)* that hold promise for increasing delivery and program impact.

5. *Continue to explore approaches for easy communication about how to deliver Marathon Kids.* As shared by MK Coaches in our pilot study as well as by some coaches in the qualitative studies, a simple one-page checklist on the 'key ingredients' for implementing Marathon Kids may be helpful for enhancing program delivery. As noted above, crafting one-pagers according to the different program models may also be a fruitful path forward.

6. *Apply lessons learned from this evaluation study for future Marathon Kids research.* An important contribution of the current pilot/exploratory study includes identification of best practices for conducting such evaluation research of the Marathon Kids program. We feel fortunate to have had the opportunity to work closely with MK staff in developing and implementing the current evaluation. For future research, recommendations include:

    - *Continue to build from an 'evaluation advisory committee' model* that includes MK stakeholders in order to ensure ownership and 'grounding' of the evaluation.

    - *Ensure comparability of study schools and conditions based on scheduled physical activity minutes.* Ideally, future research would allow for randomizing schools within a school district that has not implemented the program into study conditions in order to increase comparability of schools as relate to the delivery of PA minutes.

- *Schedule sufficient time and build relationships early* on (e.g., at least one year out from when the evaluation is intended to begin) with schools in order to be able to 'hit the ground running' with the proposed research in early fall. Obtaining district and individual approvals, teacher support, and parent consent takes time.
- *Budget sufficient resources for measurement:* While we feel we have achieved a lot with this small study based on a staff of two investigators at 5% time, a 50% time student research assistant, and a volunteer graduate student, additional resources will be needed to expand the study sample and scope for larger scale studies.
- *Continue to explore lower cost approaches for assessing physical activity engagement* (e.g, Fitbit, PAQ-C) among Marathon Kids participants in order to monitor activity levels and generate insights about program delivery and impact. As noted in our qualitative findings, there is strong interest among the Marathon Kids coach community for digital tracking of student physical activity as well as shared platforms for uploading data and generating reports on participants. We see opportunity with digital tracking to contribute both to intervention efficacy as well as process and impact evaluation goals.

Conclusion

Findings from this pilot study provide greater insights into the impact, reach, and best practices of the Marathon Kids program as well as future research considerations. While the lack of differences in primary outcomes between study conditions from the matched comparison group study merits further exploration, the differences between schools in the two study conditions- with similar or increased opportunities for PA in the comparison schools, may point to the role of structural differences (e.g., increased schedule of PE) in diluting the impact of the MK program- thus underscoring the importance of finding more comparable study schools for future research. Findings from the Finisher Survey and Star Coach Interview underscore important strengths of the Marathon Kids program, including high levels of satisfaction of MK coaches and student participants, a wide reach of the program across the U.S., implementation-related impact that includes student marathons completed and scheduled minutes for physical activity within schools and out-of-school time settings, and a range of MK coach-informed best practices for program implementation in relation to the MK program pillars. Strengths and lessons learned documented in this study provide a strong foundation for the overall approach of Marathon Kids as well as an opportunity for further engaging and co-learning with the vibrant Marathon Kids' community about best practices for advancing Marathon Kids' mission of providing a path for healthy youth development through running.

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Appendices

(see attached document)