

# Evaluation of a Nature Prescription Program in Schools to Increase Nature-Based Physical Activity and Time Spent Outdoors: Implementation of the Kids in Parks TRACK Rx Program by the School Nurse

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## Abstract

This study assessed the effectiveness of the TRACK Rx program. Track Rx is a program for healthcare professionals to counsel and prescribe outdoor physical activity (PA) to children. The program was implemented by a school nurse to increase children's time spent outdoors, increase a child's nature-based PA, and increase parents' intention for their child to spend time outdoors. Parents/guardians of children in 1<sup>st</sup>–3<sup>rd</sup> grade (intervention = 51; control = 27) completed a baseline and 3-month follow-up survey. Children's nature-based PA significantly increased on the weekend in the intervention group compared to the control group. There was no significant change in the other study variables. Parental trust in the school nurse was similar to parent trust in their child's primary health care provider. School nurses can implement TRACK Rx and other nature and nature-based PA prescription programs throughout the school (classroom, physical education, recess, and after-school programming).

## Keywords

children, green space, outdoor recreation, outdoors, park prescription, Park Rx, physical activity, school nursing, TRACK trails

There is growing evidence of the health benefits across the life span of spending time outdoors in natural settings such as parks and green space (Christiana et al., 2021). Specifically for children, these benefits include decreased symptoms of childhood life stress, psychological distress, and increased resilience (Razani et al., 2019), as well as increased moderate-to-vigorous intensity physical activity (PA) that has further known health benefits (Cleland et al., 2008; Wood et al., 2014). Due to the strength of current evidence, the American Public Health Association (2013) adopted a policy statement to increase access to nature for all ages and populations to improve health and wellness. Included in this policy statement were several action steps targeting healthcare professionals as well as schools to advise and provide education about the health benefits of nature.

Research indicates that children are spending less time outdoors. A longitudinal study in Canada showed that the amount of time spent outdoors decreased by approximately 24–35 min per day among children over a 15-year span (Matz et al., 2014). In the U.S., a similar trend is seen with

time spent in unstructured outdoor activities decreasing from 100 min to 50 min per week (Hofferth, 2009; Juster et al., 2004; Pergams & Zaradic, 2008). Furthermore, recent evidence suggests that this decrease continues today due to children spending more time inside with electronic devices and media (Kellert et al., 2017; Rideout & Robb, 2019).

One strategy for increasing children's time spent outdoors and PA that has gained widespread appeal has been prescriptions for nature and nature-based activities (James et al.,

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2019). Often referred to broadly as “park prescriptions,” “Park Rx,” “Nature Rx,” “Outdoor Rx,” as well as others, these programs involve health care professionals (pediatricians, nurse practitioners, physician assistants, etc.) counseling patients about the benefits of spending time in nature and issuing a prescription for outdoor activity. Results from research evaluating these prescription programs have been inconsistent. However, most recommend that in addition to the written prescriptions, these programs must involve supports and resources for families to get outside (Christiana, Battista et al., 2017; Razani et al., 2018; Razani et al., 2019). To the authors’ knowledge, nature prescription programs have not been implemented and evaluated in schools by nurses.

The American Nurses Association (2023) states that nurses are committed to their patients, communities, and nation; are expected to advocate for improved patient outcomes and wellness; and are responsible for promoting health. The registered professional school nurse (hereinafter referred to as school nurse) can act as an optimal prescriber for a nature prescription program especially due to the access they have to children in communities where visits to a pediatrician or other primary health care provider may be few or nonexistent (Douthit et al., 2015). Furthermore, research on health care professional perceptions of prescribing parks and nature indicate that a common barrier is a lack of time with patients to discuss the benefits and importance of spending time outdoors (Besenyi et al., 2020; Christiana, James et al., 2017). Meanwhile, school nurses may have more access and time throughout the school day with children than pediatricians and other primary health care professionals (Christiana, James et al., 2017) and already coordinate health care needs within the school system as a part of an interprofessional team.

Kids in Parks, a nonprofit program of the Blue Ridge Parkway Foundation, was founded in 2009 to engage young children and families in outdoor recreation as a way to foster lifelong wellness and meaningful connections to nature (Kids in Parks TRACK Trails, 2019). The program accomplishes this by partnering with park and public land management agencies throughout the country to convert pre-existing trails into kid- and family-friendly TRACK Trails through the installation of self-guided materials that engage participants in recreational and educational activities in parks, forests, and communities (Clark et al., 2020; Kids in Parks TRACK Trails, 2019). The program then enrolls health care professionals in its TRACK Rx program to prescribe outdoor activities and the regional network of trails to their patients. Health care professionals are given a self-guided nature activity brochure and a custom set of TRACK Rx prescription pads. Children who complete TRACK Trail experiences or other non-TRACK Trail outdoor activities can register their prescription and outings on the program’s website and earn a series of prizes (e.g., custom trail stickers, collectible activity cards, and passport

booklet) designed to make outdoor activities more fun while encouraging repeat participation. Previous research indicates that children most likely to make repeat visits to TRACK Trails are those from families with less than a high school diploma and that live in areas with higher unemployment rates (Clark et al., 2020).

The purpose of this study was to evaluate the effectiveness and feasibility of implementing the TRACK Rx program in an elementary school by the school nurse to increase children’s time spent in nature and nature-based PA. The study hypotheses were that time spent in nature and nature-based PA would increase among children who attended the school that received the TRACK Rx program compared to children who attend the school that did not receive the program.

## Method

The Appalachian State University Institutional Review Board determined that this study did not constitute human subject research as defined by university policy and the federal regulations [45 CFR 46.102 (e or l)] and did not require IRB approval due to the activities being designed around program evaluation (Study #21-0246).

## Participants and Setting

The setting for the study was a county school district in North Carolina. According to the North Carolina Department of Commerce, the county is classified as rural and designated as one of 40 Tier One Counties in the state (North Carolina Department of Commerce, 2021). This designation indicates the county ranks as one of the most-distressed counties in North Carolina for economic well-being. According to the U.S. Census Bureau, the county had a total population of 65,969 residents as of 2020 with 23.2% of the residents being persons under 18 years of age (U.S. Census Bureau, n.d.). Additionally, 86.6% of the county population identify as White, 7.1% as Hispanic or Latino, and 4.0% as Black or African American. As of 2021, 14.1% of the population is without health insurance, 19.5% of the population lives at or below the poverty line, and 32.2% have a minimum of a high school degree or equivalent.

This study was conducted with 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup>-grade students, along with their parents or legal guardians, at two elementary schools (one intervention school and one control school) from May to September of 2022. Different school nurses were responsible for the students at each school. These elementary schools were chosen for the study due to their centralized location within the county and proximity to TRACK Trails and places for nature-based activities. Eight TRACK Trails had previously been established within the county that provide children and families with various types of outdoor recreation opportunities, including

hiking, biking, and disc golfing. In addition to these TRACK Trail sites, the county has other opportunities for outdoor recreation and nature-based activities including parks, playgrounds, and greenways.

Parents or legal guardians of a child in 1<sup>st</sup>, 2<sup>nd</sup>, or 3<sup>rd</sup> grade attending one of the two elementary schools were eligible to participate in the study. To recruit participants for the baseline survey, the administrative staff at each elementary school sent an email to all parents of 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup>-grade students asking them to complete an online Qualtrics survey. Only one parent or legal guardian per household was asked to complete the survey. Three months after implementing TRACK Rx, parents that completed the baseline survey were then sent an email by the research team requesting to complete a follow-up online survey. Incentives of a \$20 and \$40 gift card were provided to parents that completed the baseline and 3-month follow-up surveys, respectively. One hundred twenty-two parent-child dyads were recruited for the study by completing the baseline survey ( $n_{\text{intervention}} = 71$ ;  $n_{\text{control}} = 51$ ), representing a total response rate of 40.3% (intervention = 44.1%; control = 36.0%). The final sample size of parents that completed both the baseline and 3-month follow-up survey was 78 ( $n_{\text{intervention}} = 51$ ;  $n_{\text{control}} = 27$ ).

### Intervention

Prior to the study, the nurse in the intervention school received training from the research team. This training focused on how the school nurse would provide students with information on the health benefits of spending time outdoors and nature-based PA, the opportunities that exist for nature-based PA in the local area, as well as the goals and options for the prescriptions so that the school nurse could individualize each student's plan of care.

After baseline data were collected, the school nurse at the intervention school visited each 1<sup>st</sup> through 3<sup>rd</sup>-grade classroom and delivered the TRACK Rx materials to prescribe outdoor activities and TRACK Trails. The intervention was intentionally implemented at the end of the school year to allow for opportunities for outdoor activities during the summer break. The school nurse wrote the prescriptions with each student using a patient-centered approach, allowing the student to self-select the types of activities (i.e., play outside, play in a park, go for a walk/run/bike ride, play an active game or sport with friends, and go for a hike on a TRACK Trail) they wanted to commit to engaging in and the dosage (i.e., 30 min 3 times per week, or similar). Once the students filled out their preferences, the school nurse consulted with each student about their prescription and then both the student and school nurse signed the prescription, creating a level of accountability for the student.

In addition to the written prescription, the school nurse provided each student with the Kids in Parks program's *Hiking Toward Health* brochure, which provides nature-

based activities and information about the health benefits of spending time in nature. After students received their prescription, the school nurse sent reminder emails to parents of children at 1-month and 2-month post-intervention about the prescriptions and the importance of outdoor activity for their child's health.

### Data Collection

To evaluate the effectiveness of the intervention, a baseline survey was completed by parents of 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup>-grade students in the two elementary schools prior to the intervention school nurse implementing TRACK Rx. The baseline survey assessed demographic variables of child and parent including sex, age, race/ethnicity, parent level of education, and total household income. Parents who completed the baseline survey in both schools were then emailed a 3-month follow-up survey.

Frequency of time spent outdoors was assessed by three items asking how often the child spends time in nature or the outdoors with family/with friends/by themselves. These questions were asked on 5-point scales from "less than one time per month" to "5 or more times per week." Child's PA was assessed using the Youth Risk Behavior Surveillance System standard item that was adapted to parent-report. This item asked about the number of days during the past week that the child was physically active for a total of at least 60 min per day. Nature-based PA was assessed by two items that asked for the amount of time during an average weekday/school day and weekend/non-school day that the child spends in PA in nature or the outdoors. These questions were asked on an 8-point scale from "none" to "more than 5 h per day."

According to the theory of planned behavior (TPB), the most important predictor of a person engaging in a behavior is intention (Ajzen, 1985, 1991). Parent intention to have their child spend more time in nature and the outdoors within the next 3 months was assessed by one item adapted from the standard TPB instrument. This item was asked on a 5-point Likert scale from "strongly disagree" to "strongly agree."

Prior to this study, the TRACK Rx program has mainly been implemented by children's primary health care providers (pediatrician, physician's assistant, nurse practitioner, etc.) to promote trust among parents that spending more time outdoors in nature-based PA would be good for their child's health. As this study is the first to implement TRACK Rx by a school nurse, parental belief of trust that the school nurse is a reliable source of health information concerning their child was assessed at the 3-month follow-up by one item on a 5-point Likert scale from "strongly disagree" to "strongly agree." For comparison, a second item similarly assessed parental belief of trust that their child's primary health care provider is a reliable source of health information concerning their child.

## Data Analysis

All statistical analyses were conducted using IBM SPSS Statistics, version 28 (IBM Corp., Armonk, NY, USA). To test whether children's time spent in the outdoors, PA, outdoor PA, and parents' intention to have their child spend more time outdoors increased from baseline to 3-month follow-up in those who received the TRACK Rx compared to the control, generalized estimating equations (GEEs) were conducted. The GEE analyses modeled the simple effects for differences across the two time points (baseline and 3-month follow-up) and group (intervention and control) and the interaction between the two. The alpha level for all analyses was set at  $p < .05$ . A Mantel-Haenszel test of trend was conducted to determine whether a linear association existed between parent trust in the

school nurse as a reliable source of health information and their child's primary health care provider.

## Results

The demographic characteristics of the study participants are provided in Table 1. Parents in both the intervention and control groups identified as mostly female (86.3% and 85.2%, respectively) and White (90.2% and 74.1%, respectively). Regarding the highest level of education within the children's household, 11.8% and 25.9% reported a high school diploma or GED with only 3.9% and 0.0% reporting less than a high school degree (intervention and control, respectively). Total household income was relatively high with 73.5% and 44.4% reporting making over \$50,000 annually (intervention and control, respectively). Children had a mean age of 7.7 years (in both intervention and control) with 51.0% and 70.4% identifying as female and 78.4%

**Table 1.** Demographic Characteristics of Parents and Children.

Variable	Intervention (%)	Control (%)
<b>Parent</b>		
<b>Sex</b>		
Female	44(86.3)	23(85.2)
Male	7(13.7)	3(11.1)
Prefer not to answer	0(0.0)	1(3.7)
<b>Race/ethnicity</b>		
White	46(90.2)	20(74.1)
African American or Black	1(2.0)	3(11.1)
Hispanic or Latino	4(7.8)	3(11.1)
Multiracial	0(0.0)	1(3.7)
<b>Highest level of education of all adults in household</b>		
Less than high school	2(3.9)	0(0.0)
High school grad or GED	6(11.8)	7(25.9)
Some college	18(35.3)	14(51.9)
Bachelor's degree or higher	25(49.0)	6(22.2)
<b>Total household annual income</b>		
Under \$10,000	1(2.0)	2(7.4)
\$10,000–\$24,999	5(9.8)	4(14.8)
\$25,000–\$49,999	7(13.7)	9(33.3)
\$50,000–\$99,999	26(51.0)	10(37.0)
Over \$100,000	10(19.6)	2(7.4)
Prefer not to respond	2(3.9)	0(0.0)
<b>Child</b>		
<b>Age in years, mean(SD)</b>		
	7.7(1.07)	7.7(1.21)
<b>Sex</b>		
Female	26(51.0)	19(70.4)
Male	25(49.0)	8(29.6)
<b>Grade</b>		
1 <sup>st</sup>	17(33.3)	14(51.9)
2 <sup>nd</sup>	21(41.2)	7(25.9)
3 <sup>rd</sup>	13(25.5)	6(22.2)
<b>Race/ethnicity</b>		
White	40(78.4)	18(66.7)
African American or Black	0(0.0)	4(14.8)
Hispanic or Latino	8(15.7)	4(14.8)
Multiracial	2(3.9)	1(3.7)
Prefer not to answer	1(2.0)	0(0.0)

**Table 2.** Means and Standard Deviations for Outcome Variables at Baseline and 3-Month Follow-Up.

Variable	Baseline (SD)	3 Months (SD)
<b>Frequency of time spent outdoors with family<sup>a</sup></b>		
Intervention	4.27(0.83)	4.16(0.87)
Control	4.04(0.71)	4.07(1.00)
<b>Frequency of time spent outdoors with friends<sup>a</sup></b>		
Intervention	3.73(1.34)	3.92(1.24)
Control	3.33(1.30)	3.81(0.96)
<b>Frequency of time spent outdoors by themselves<sup>a</sup></b>		
Intervention	2.94(1.53)	3.06(1.52)
Control	3.33(1.47)	2.89(1.60)
<b>Days in the past week that child was physically active for at least 60 min</b>		
Intervention	4.91(2.20)	5.16(1.59)
Control	4.57(2.04)	5.17(1.82)
<b>Hours/day of outdoor physical activity on weekdays<sup>b</sup></b>		
Intervention	2.20(1.10)	2.31(1.19)
Control	2.11(1.53)	2.15(1.26)
<b>Hours/day of outdoor physical activity on weekend days<sup>a</sup></b>		
Intervention	2.78(1.32)	3.04(1.23)
Control	3.33(1.59)	2.81(1.50)
<b>Parent intention for child to spend more time in nature/outdoors<sup>c</sup></b>		
Intervention	4.39(0.87)	4.16(0.85)
Control	4.44(0.70)	4.15(0.72)

Note. The analytic sample in the intervention group contained 51 at baseline and at 3 months and the control group contained 27 at baseline and at 3 months.

<sup>a</sup>5-point scale from 1 (less than one time per month) to 5 (5 or more times per week).

<sup>b</sup>8-point scale from 1 (None) to 8 (More than 5 h per day).

<sup>c</sup>5-point scale from 1 (Strongly disagree) to 5 (Strongly agree).

**Table 3.** Results from the Generalized Estimating Equations.

Variable	Simple effect: Time	Simple effect: Group	Interaction: Time × Group
Frequency of time spent outdoors with family	0.00(.98)	1.07(.30)	1.22(.27)
Frequency of time spent outdoors with friends	4.81(.03)	2.25(.13)	0.50(.48)
Frequency of time spent outdoors by themselves	0.66(.42)	0.13(.72)	2.50(.12)
Days in the past week that child was physically active for at least 60 min	1.95(.16)	0.18(.67)	0.33(.57)
Hours/day of outdoor physical activity on weekdays	0.07(.79)	0.52(.47)	0.10(.76)
Hours/day of outdoor physical activity on weekend days	0.71(.40)	0.28(.60)	6.67(<.01)
Parent intention for child to spend more time in nature/outdoors	6.06(.01)	0.05(.82)	0.09(.76)

Note. Numbers presented in the table are Wald Chi-Square tests of model effect with  $p$ -values in parentheses.  $df=1$  for the time simple effect,  $df=1$  for the group simple effect,  $df=1$  for the interaction. The analytic sample in the intervention group contained 51 at baseline and at 3 months and the control group contained 27 at baseline and at 3 months.

and 66.7% identifying as White (intervention and control, respectively).

Table 2 provides the means and standard deviations for the dependent variables. The hours per day that children spend in outdoor PA on weekend days increased in the intervention group and decreased in the control group from baseline to follow-up while the hours per day that children spend in outdoor PA on weekdays increased in both groups. The frequency of time that children spend in nature or the outdoors with family decreased in the intervention group and increased in the control group while the frequency of time with friends increased in both groups. The frequency of time that children spend by themselves increased in the intervention group and decreased in the control group. Parental intention for having their child spend more time in nature and the outdoors during the next three months decreased in both groups. Lastly, the number of days in the past week that children were physically active for at least 60 min increased in both the intervention and control groups.

The GEE analyses are presented in Table 3. Results indicated that the hours per day of outdoor PA on weekend days was statistically significant ( $p < .01$ ) with an increase in the intervention group and a decrease in the control group from baseline to 3-month follow up. However, the changes in children's frequency of time spent in nature or the outdoors with family, with friends, or by themselves, days in the past week of PA for at least 60 min, hours per day of outdoor PA on weekdays, and parent intention for child to spend more time in nature or the outdoors were not statistically significant between the intervention and control groups.

In terms of parental beliefs of trust in the school nurse in both the intervention and control groups, 85.5% of parents responded that they either agree or strongly agree that the school nurse is a trusted source of health information concerning their child while 94.7% responded they either agree or strongly agree that their child's primary health care provider is a trusted source. A Mantel-Haenszel test of trend was conducted to determine whether a linear association existed between parental beliefs of trust in their child's primary health care provider as a reliable source of health

information and trust in the school nurse. Both were scored from 1 to 5 (*strongly disagree* to *strongly agree*). The Mantel-Haenszel test of trend showed a statistically significant linear association between parent trust in their child's primary health care provider and the school nurse,  $\chi^2(1) = 37.233$ ,  $p < .001$ ,  $r = .705$ . Greater parental trust in their child's primary health care provider was associated with greater trust in the school nurse and vice versa.

## Discussion

To the authors' knowledge, this is the first study to implement and evaluate the effectiveness of nature prescriptions delivered to children by a school nurse in the school system. The study found that the TRACK Rx implemented by the school nurse increased the amount of time per day that children engaged in outdoor PA on the weekend, but did not significantly increase children's time spent outdoors, overall PA, outdoor PA on weekdays, or parent intention to have their child spend more time in nature and the outdoors. Furthermore, the trust that parents in both the intervention and control groups had in the school nurse was similar to the trust they had in their child's primary health care provider.

Previous research on prescriptions for children's PA written by health care professionals has found similar results in terms of no change to overall PA, particularly among children not already motivated to be more active (Ortega-Sanchez et al., 2004; Patrick et al., 2001; Rowland et al., 2007; Saelens et al., 2002). One of the few studies that have been conducted on prescriptions for children's PA specifically in the outdoors also found no change in overall PA, outdoor PA, or time spent in the outdoors (Christiana, Battista et al., 2017). Contrary to previous research, the current study found that among children who received a TRACK Rx, outdoor PA increased significantly on the weekend compared to the control, but not during the week. Despite no change on weekdays, an increase in weekend outdoor PA may be important to children's exposure to nature and to PA. It is possible that children's visits

to TRACK Trails and other hiking trails, parks, and green spaces occur more frequently on weekend days rather than during the week (after school and/or work) and occur with family members such as parents, guardians, or siblings.

In the current study, a potential explanation for the lack of change in time spent outdoors, PA, and outdoor PA on weekdays may be due to seasonality. The baseline data for this study were collected toward the end of one school year in the late Spring, while the 3-month follow-up occurred toward the beginning of the next school year in the early part of Fall. While both surveys collected data on children's behavior during a school year, the parents' responses may have been influenced by children's activity levels during the summer break as children's time spent outdoors, overall PA, and outdoor PA on weekdays increased in both the intervention and control groups. Similarly, parental intention at baseline would have included parental intention to have their child spend more time outdoors during the summer break time period while parent intention at the 3-month follow-up would have included the time period when children were in school, also a period when daylight hours were shortening and when colder temperatures were more prevalent.

Research indicates that in order for nature prescription programs to improve health behaviors, it is vital that these programs include more than simply the written prescription from a health care professional (Christiana, Battista et al., 2017; Christiana, James et al., 2017; James et al., 2019; Razani et al., 2018; Razani et al., 2019). These may include extended counseling and discussion between health care professional and patient about how and where they may go for nature-based PA, referral to a parks and recreation professional that can help patients locate places for nature-based PA, and organized group outings to parks and outdoor spaces with those who have received a prescription and the prescribing health care professional such as the Walk with a Doc program (<https://walkwithadoc.org/>).

The TRACK Rx program conducted in the current study included some of these additional aspects including the conversation the school nurse had with students about the health benefits and where to go locally for nature-based PA as well as the reminder emails sent to parents. Additionally, the surrounding community where the schools were located had a strong regional network of TRACK Trails and other parks that provide opportunities to spend time in nature. However, further incorporation of the TRACK Rx program in the school may be needed. Therefore, it is recommended that the implementation of TRACK Rx in schools utilize a student-centered approach supported by the interprofessional team that includes prescriptions written by the school nurse as well as incorporating nature-based activity programming into physical education classes, outdoor recess, and within the classroom curriculum as warranted with teacher support. Other supports for TRACK Rx in the surrounding community may include Safe Routes to School and Safe Routes to Parks initiatives to promote active transportation

and access to green spaces (Safe Routes Partnership, 2021). In line with the Framework for 21st century School Nursing Practice, the school nurse can lead these efforts to promote nature-based PA (National Association of School Nurses, 2016). This framework, which is aligned with the Whole School, Whole Community, and Whole Child model (Association for Supervision and Curriculum Development & Centers for Disease Control and Prevention, 2014), includes four key principles of Leadership, Care Coordination, Quality Improvement, and Community/Public Health that ideally position the school nurse to integrate nature prescription programs such as TRACK Rx in schools and communities.

The nursing profession has historically been rated and continues to be rated, as the most trusted health care profession by patients for 21 years in a row (Gallup News Service, 2022). Even with health care shortages, distrust in the health care system by the U.S. population, and the overwhelming news coverage from the COVID-19 pandemic, 79% of adults surveyed in 2022 said that nurses were honest and ethical. The current study supports this trust in the nursing profession as a vast majority of parents viewed the school nurse as a trusted source of health information for their child similar to the well-established primary care provider. In the current study, the school nurse had limited direct contact with the parent or legal guardian since the TRACK Rx program was administered via a student-centered approach during the school day. Therefore, parent trust in the school nurse was high despite the fact that parents may or may not regularly discuss their child's health care needs with the school nurse as they are more likely to do with their child's primary health care provider (i.e., yearly wellness visits and sick visits).

### *Limitations*

The current study examined an innovative implementation strategy for nature prescriptions in schools by the school nurse. There are several limitations that need mention in relation to the design of the study. The first is that the study used a convenience sample with the final sample size of parents that completed both the baseline and 3-month follow-up surveys being relatively small. This could have impacted the findings, particularly the ability to detect statistical significance with small effect size. Given the ease of the TRACK Rx intervention in terms of cost and time to deliver, even a slight positive change in children's behaviors would be important. Secondly, children's time spent outdoors, PA, and outdoor PA were collected through parent report which could lead to measurement error such as over reporting (Adams et al., 2005; Sallis & Saelens, 2000). Therefore, future research should use more objective measures such as accelerometry, pedometry, and GPS. Lastly, as mentioned previously, although both data collection time periods occurred during the school year, the issue of seasonality

may have impacted responses at 3-month follow-up due to possible changes in children's overall activity during the summer when school was out of session that may have continued through the initial weeks of the new school year.

## Conclusions

The TRACK Rx nature prescription program implemented by the school nurse was associated with increased outdoor PA on weekend/nonschool days among children, but not with time spent outdoors, overall PA, and outdoor PA on weekday/school days. Given the simple nature of the TRACK Rx program, future research is warranted to test the effectiveness of TRACK Rx to increase children's outdoor PA and knowledge about the health benefits of spending time in nature and nature-based PA. Furthermore, future research should integrate TRACK Rx more thoroughly throughout the school through physical education programming, recess, and classroom curriculum where appropriate.

## Implications for School Nursing

In terms of prescribing PA, previous research has indicated that school nurses' perceptions are positive and view prescriptions as a valuable tool and resource for them (Wiklund et al., in press). The current study provides support for the expanded role of school nurses in children's health and health care, particularly given the high level of trust that parents have in the school nurse in relation to their child's health. Given this, the school nurse could be utilized to a greater capacity to improve children's health and as an increased part of children's health care team to make holistic treatment plans for children in the school systems in which they serve. The school nurse can act as the champion or leader of school-wide efforts to promote nature-based PA that includes the classroom, physical education, and after-school programming.

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