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Macro activity patterns of farmworker and non-farmworker children living in an agricultural community

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Abstract

Background—Children of farmworkers have significantly higher exposure to pesticides than do other children living in the same agricultural communities, but there is limited information about how and where older farmworker children (>6) spend their time and how their activities might influence the risk of pesticide exposure.

Objectives—Using data from the Community Based Participatory Research Study for Healthy Kids, we compared activity patterns recorded over 7 days during two agricultural seasons (pre thinning and thinning) between farmworker and non-farmworker children aged 6-12 years old living in Eastern Washington State.

Methods—Parents completed a 7-day activity diary recording the activity patterns of their children. Mean differences in individual-level activity patterns across season were analyzed using paired t-tests and the Signed Rank Test. Differences in mean activity pattern comparing farmworker and non-farmworker children were analyzed using the Wilcoxon Sum Rank Test to assess differences in distributions across independent samples.

Results—We observed substantial differences in child activity patterns between the two seasons. The children in this sample spent more time outdoors ($p<0.001$) and were more likely to engage in behaviors, such as playing in the fields ($p=0.01$) and accompanying their parents to work in the fields ($p=0.001$) during the high-spray thinning season. There were some differences in activities and behaviors between farmworker and nonfarmworker children during the thinning season.

Conclusion—This study demonstrates that multiple factors, including agricultural season and parental occupation, may be associated with differences in activity patterns that could influence

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risk of pesticide exposure among children living in agricultural communities. As such, these factors may influence variation in exposure risk and should be considered when analyzing pesticide exposure measurements in these groups.

Introduction

Children of farmworkers have significantly higher exposure to pesticides than do other children living in the same agricultural communities (Thompson et al. 2003; Lu et al. 2000; Coronado et al. 2011). Factors such as the take-home pathway and the proximity of the farmworkers' homes to agricultural fields have been shown to influence pesticide exposure risk (Thompson et al. 2003; Lu et al. 2000; Coronado et al. 2011; Fenske et al. 2000). In addition, children living in agricultural communities have significantly higher pesticide exposure levels during seasons when pesticides are applied to the fields relative to seasons when pesticides are not applied (Koch et al. 2002; Griffith et al. 2011). However, very little is known about whether individual activity patterns also contribute to differences in pesticide exposure between farmworker and non-farmworker children and within children across agricultural season. This descriptive study aims to compare child activity patterns recorded over 7 days during the pre-thinning and thinning seasons between farmworker and non-farmworker children aged 6-12 years old living in an agricultural community in Eastern Washington State.

Pesticide exposure pathways are complex as they involve spatial, temporal, and individual-level factors and farmworker children may be particularly vulnerable to exposures from multiple pathways (Faustman 2000). Therefore, information is needed about various exposure routes, including child activity, to understand the range of potential risk factors (Bradman et al. 2007; Quandt et al. 2006; Cohen Hubal et al. 2000; Quackenboss et al. 2000). A number of studies have shown that farmworker children are exposed to higher levels of pesticides in their homes compared with their non-farmworker counterparts (Thompson et al. 2003; Lu et al. 2000; Coronado et al. 2011; Fenske et al. 2000; Bradman et al. 2007). In addition, farmworker children may be spending a significant amount of time in other physical environments with high exposure levels, such as schools or daycare centers or engaged in activities that could heighten their risk (Wilson et al. 2007; Freeman et al. 2005; Cooper et al. 2001). Results from focus group sessions with farmworker children showed that they were engaged in activities such as swimming in irrigation ditches, playing near agricultural fields after pesticide spraying, and working in the fields with their parents during the summer (Cooper et al. 2001). Given the multitude of potential risks there is a need to understand how activity patterns might be affected by a child's family characteristics and seasonal factors.

Previous research has examined farmworker children's exposure in the context of the home environment (Quandt et al. 2006). The emphasis of such research has been on crowding and parental behavior, such as hygiene and sanitation practices and use of personal protective equipment at work (Quandt et al. 2006). Very little research has assessed risk in the context of where and how children, especially those over the age of 5, spend their time. Micro activity studies have quantified exposure risk for young farmworker children by observing hand to mouth behaviors (Freeman et al. 2005; Zartarian et al. 1995; Beamer et al. 2008).

However, these studies have generally focused on children under the age of 6 in the home environment. The few studies that did examine macro activities among farmworker children did so as a secondary focus and did not report consistent or conclusive findings (Lu et al. 2000; Bradman et al. 2007).

Individual attributes also influence activity patterns (Koch et al. 2002; Cohen Hubal et al. 2000; Freeman et al. 2001). One population-based study observed children between the ages of 3 and 13 years old and found that boys spent more time outdoors than girls, but that girls had a higher frequency of hand to mouth behaviors than boys (Freeman et al. 2001). Younger children (aged 3-4 years) also demonstrated a higher frequency of object to mouth behaviors. Temporal factors, such as season, may also influence behaviors and risks. Studies have found significantly higher levels of pesticide metabolites in children during the spring and summer months which coincided with the agricultural pesticide spray season (Koch et al. 2002; Griffith et al. 2011). We were unable to find any studies that examined macro activity patterns across season, but it is possible that differences in child activities and behaviors during the summer months contribute to higher exposure levels.

There is limited information about how and where older farmworker children (>6) spend their time and how activity patterns might influence individual risks of pesticide exposure. This study describes where children living in agricultural communities spend their time (home, school or other), the amount of time they spend outdoors versus indoors, and the frequency with which they engage in behaviors, such as spending time in the agricultural fields. Further, we will examine how these patterns differ across two agricultural seasons and differences in activity patterns between farmworker and non-farmworker children.

Methods

Setting

This study was conducted in an agricultural valley of Eastern Washington State in 2011-2012 where approximately 67% of the residents are Hispanic, and 94% of them are of Mexican heritage.

Recruitment

At the time of enrollment, 120 subjects (60 adults and 60 children) were members of families where at least one adult was employed in agricultural work. Simultaneously, 80 subjects (40 adults and 40 children) were members of families where no one was employed in agricultural work. This cohort (formed in 2011) is part of a larger cohort of 100 farmworker families and 100 non-farmworker families that was recruited in 2006 for the purpose of examining pesticide exposure among farmworkers, non-farmworkers, and the children of both during different agricultural seasons (Coronado et al, 2011). The 2006 cohort was not subject to inclusion requirements regarding occupational status, such as a minimum amount of time spent per year working as a harvester or thinner. For inclusion into the 2011 study all participants had to have the same occupational designation (farmworker vs. non-farmworker) as they had when they were enrolled in the 2006 study. This establishes a fairly long-term occupational trend among participants in this study.

For this 2011 follow-up study, we re-contacted a subset of farmworker families and non-farmworker families to further explore differences in exposures to organophosphate pesticides (OPs). Cohort members of this particular investigation were recruited by *promotores*, local community members who were trained and paid by the project. *Promotores* went to the homes of previous participants and asked if the family would like to be part of the new study. If the response was affirmative, the project was explained in more depth and, for those who continued to be interested, informed consent was reviewed and signed in accordance with the protocol approved by the Institutional Review Board at the Fred Hutchinson Center Research Center. Participants were given a household total of $250 for participation in all three phases of data collection which was spread out over a year.

Inclusion Criteria

Farmworkers needed to be aged 18 or older, have a child in the household aged six to 14 who could participate in the study, plan to be in the Valley for an entire year, and work as a thinner or harvester in apple or pear crops. For non-farmworkers, the inclusion criteria required that the participant be 18 or older, have a child aged six to 14 who could participate in the study, plan to be in the Valley for an entire year, and not work as a farmworker or in a fruit-packing warehouse.

Study Procedures

Data collection for this phase of the study occurred between March and December 2011 at three different time periods corresponding with seasons in which various types of pesticide sprays were used—pre-thinning season (March through April), thinning season (June through July), and non-spray season (November through December). Pre-thinning is when chlorpyrifos is used on orchards. During the thinning season buds are picked to allow orchard crops ample space to grow and azinphos-methyl and phosmet are the most commonly used pesticides during this time. During winter no pesticide sprays are applied to orchards. This study compares child activity patterns between the pre-thinning and the thinning seasons only. The thinning season is the high-spray pesticide season though some pesticides are applied during the pre-thinning season. The non-spray season takes place during the winter months when there is no pesticide spray and so data from this observation period is not included.

Participants answered a number of survey questions in each season that included demographics, eating habits, activity patterns, protective practices, and pesticide exposure at work and at home. Information about activity patterns was collected over a 7 day period. Trained staff administered two questionnaires and provided detailed instructions to participants about how to complete a 7-day macro activity diary. Activity questionnaires were completed by the adult respondent about the same referent child during each data collection period. Adult participants recorded the amount of time within a 24 hour period that their child spent 1) inside and outside the home, 2) inside and outside school, and 3) doing other activities. Time inside and outside the house is defined as the time that the child spent around the home. Time inside and outside school refers to the time that children spent in and around the school. Time doing other activities refers to other time in which the children were neither around the school or at home.

Participants were also asked about specific activities undertaken by the child enrolled in the study including the number of times in the past week the child had played in the fields or orchards and the number of times in the past 30 days that the child had accompanied a parent to work in the agricultural fields (this question did not apply to non-farmworker children). All instruments were approved by the Institutional Review Board at the Fred Hutchinson Cancer Research Center.

Analysis

We combined the macro activity information (time inside and outside the home, inside and outside school) to create a variable that represented the total number of hours the children spent outdoors and indoors during the 7-day data collection period for each season. Binary variable were created to identify those who had ever played outside in the agricultural fields in the past seven days and children who had ever accompanied their parents to work in the fields (farmworker children only). Children were classified by the occupation of their referent parent and activity patterns were classified by whether they had occurred during the pre-thinning or thinning season. We hypothesized that children living in an agricultural area would spend more time outdoors and in the agricultural fields during the thinning season/ high spray season, which occurs during the summer months. Further, we compared children whose parents worked as farmworkers to those who did not to learn whether differential activity patterns might contribute to the increased risk for pesticide exposure observed among farmworker children.

We conducted a univariate analysis to describe the activity patterns of children in these agricultural communities during the pre-thinning and the thinning seasons. We use paired t-tests to measure the mean of the differences of individual farmworker children activity patterns by agricultural season. The outcomes of interest are the mean of the difference for each individual across season in number of hours spent outside, number of hours spent inside, number of hours spent in area outside home, number of hours spent inside home, number of hours spent in area outside school, number of hours spent inside school, number of hours spent doing other activities, number of days played in the field, number of days accompanied parent to work in the fields. The paired t-test is used for matched data and normality assumptions are considered by examining the distribution of the difference within children by season. For the most part, the distributions of these differences were approximately normal and met the distributional assumptions of the paired t-test. The distribution of the difference in the number of days that a child accompanied their parent to work in the fields was the only continuous difference that was not normally distributed. Therefore, the mean of this difference is presented and statistical significance is assessed using the Signed Rank Test for paired data. The Signed Rank Test tests whether the distribution of the differences is centered at zero. For each activity pattern variable the mean by season, standard deviation of the mean, mean of the difference and its 95% confidence interval, and the level of statistical significance are presented. Statistical significance for the difference in proportion of the binary activity pattern variables across season is assessed using McNemar's Exact Test to account for the lack of independence. The proportion, difference and 95% confidence intervals, and significance levels are presented.

Mean differences in child activity patterns comparing farmworker and non-farmworker children stratified by season are also presented. The continuous outcomes are number of hours spent outside, number of hours spent inside, number of hours spent in area outside home, number of hours spent inside home, number of hours spent in area outside school, number of hours spent inside school, number of hours spent doing other activities, number of days played in the field. Statistical inference for the continuous outcomes is judged using p-values from the non-parametric Wilcoxon Sum Rank Test because several of the outcomes were highly skewed and did not meet the distributional assumptions of the t-test. The t-test is used in this case because we are comparing distinct groups of children. The Wilcoxon Sum Rank Test tests whether two independent samples are drawn from populations with the same distribution. For each activity pattern variable the mean by parental occupation, standard deviation of the mean and significance levels are presented. Analysis package STATAIC 11 was used to perform the statistical tests (StataCorp 2009).

Results

Sample

The sample for this analysis includes 59 farmworker children and 40 non-farmworker children. One nonfarmworker family was lost to follow up during the second season (thinning). This observation was classified as missing in the thinning season descriptive analysis and in the analysis comparing pre-thinning and thinning season activity patterns. One child from a farmworker family was aged 16 years old and therefore did not meet the inclusion criteria; this child was dropped from the analysis.

Demographics

The median age of children in both the farmworker and non-farmworker samples was 9.5 years. Farmworker children ranged from 6 to 12 years old and non-farmworker children ranged from 7 to 12 years old. Gender was evenly distributed across the two groups (Table 1). All farmworker families and 98% of non-farmworker families were classified as Hispanic. Non-farmworker parents were more likely to speak English, have higher levels of acculturation and have lived in the United States for more time compared with the parents of farmworker children. Non-farmworker families also have slightly higher income levels compared with farmworker families.

Activity Patterns

We examined the total number of hours that children spent outdoors, indoors and doing other activities in a 7-day period in both seasons. We found statistically significant differences in how children spend their time by season for almost activities (Table 2). For example, children spend 9 hours a week more outside and 15 fewer hours per week inside during the thinning compared with the pre-thinning season. These results may be attributed to the greater amount of time each day that children spend inside school during the pre-thinning season. We also observed differences in activity patterns between farmworker and non-farmworker children during the thinning season only (Table 3). In the thinning season farmworker children spend on average 6 more hours per week outside and 12 more hours per week inside than non-farmworker children; this difference is possibly related to the 1.4

more hours per day that non-farmworker children spend engaged in other activities. The findings are statistically significant despite the high variability in the mean values of activity pattern outcomes.

We also assessed the frequency with which children engage in activities, such as spending time in the agricultural fields, and examined differences by season and parental occupation. During the pre-thinning season only 6% of all children played in the fields versus 18% during the thinning season (Table 2). As a result, all children in this sample spent, on average, 0.7 more days per week playing in the fields during the thinning season than the pre-thinning season (Table 2). Farmworker children spent 0.4 more days playing in the fields compared with non-farmworker children (Table 3). During the thinning season, 20% of farmworker children accompanied their parents to work in the fields compared with only 2% during the pre-thinning season (Table 2).

Discussion

Previous research has focused on the micro activities of very young children living in agricultural communities (Zartarian et al. 1995; Freeman et al. 2001; Freeman et al. 2005; Beamer et al. 2008). However, to our knowledge, this is the only study that has compared the macro activity patterns of older children living in agricultural communities across different agricultural seasons. This study contributes to the literature by providing information about how children living in agricultural communities spend their time and whether factors, such as parental occupation and season, may be associated. Further, these results may provide insight about potential activity-based risk factors that could explain differences in pesticide exposure between farmworker and non-farmworker children across two agricultural seasons.

We observed statistically significant differences in activity patterns between the two seasons. The children in this sample spent substantially more time outdoors (10 hours per week) and a much higher proportion of children spent time in the agricultural fields during the thinning season. The differences in activity patterns are most likely due to the fact that the thinning season data collection period coincided with summer vacation and warmer weather. Some of the schools were also out of session for spring break during the pre-thinning season data collection period. Had the data collection period not occurred over spring break we might have observed even greater differences in activity patterns between the two seasons. Spending more time outdoors and in the agricultural fields during the thinning season could be associated with an increased risk of pesticide exposure during the summer months.

Research has shown that farmworker children have higher levels of pesticide exposure than non-farmworker children (Thompson et al. 2003; Lu et al. 2000; Coronado et al. 2011). It is possible that differences in activity patterns could be responsible for some increased risk. Our findings also show some statistically significant differences regarding how and where farmworker and non-farmworker children spend their time, particularly during the high-spray thinning season. Farmworker children were more likely to spend time outdoors than nonfarmworker children while non-farmworker children were more likely to be engaged in

other activities, such as doing errands. These findings are likely attributed to the time that farmworker children spend with their parents working in the fields and may be compounded by other socio-demographic characteristics, such as income and acculturation. For example, lower income families may not be able to afford to pay for childcare or extracurricular activities during the summer months when children are not in school. Language abilities and acculturation, factors influenced by number of years spent living in the US, may also hinder a family's access to information about the harmful effects of pesticides on human health. Finally, the lack of statistically significance differences in activity patterns between farmworker and non-farmworker children during the pre-thinning season is likely attributed to the time spent doing school-related activities.

Previous studies have also shown that farmworker children engage in behaviors that might heighted their exposure to pesticide spray, such as playing in the fields (Cooper et al. 2001). The results from this study do not demonstrate statistically significant differences in playing in the agricultural fields between farmworker and non-farmworker children; however, a sizeable proportion of farmworker children accompanied their parents to work in the fields during the high-spray thinning season. Therefore, overall time spent outside either playing or with parents in the fields may be an important source of variability in exposure to pesticide spray between the two groups.

Our findings highlight the need to consider multiple factors when assessing risk factors for pesticide exposure among children living in agricultural communities. Temporal factors such as agricultural activities, school holidays and hot weather are associated with changes in activity patterns that could influence risk. Activity patterns may also be influenced by family characteristics, such as parental occupation. These factors may influence variation in exposure risk and should be considered when analyzing pesticide exposure measurements among children in these communities.

This study has some limitations that should be considered. First, the pre-thinning data collection period occurred during spring break for some of the children and their activity patterns may not have been representative of those in weeks when school was in session. However, it is likely that this biased the findings towards the null as activity patterns during spring break are likely similar to patterns during summer vacation. Also, non-farmworker children spent a significant amount of time per day engaged in other activities, but we do not know what these activities were and cannot infer how they influenced exposure to pesticide spray.

Despite these limitations, this study has important strengths. First of all, the sample size is relatively large compared with other studies of farmworker groups in the US. In addition, sample homogeneity minimized confounding and enhanced the validity of the findings comparing farmworker and non-farmworker children. Further, this is one of the only studies that has examined activity patterns and behaviors of older children living in agricultural communities. The next step is to examine the children and their activities as related to pesticide metabolites that may be found in biological samples.

Conclusion

This study examined several dimensions of risk including where and how children living in agricultural communities spent their time. The study also compared activities and behaviors during two agricultural seasons to capture variations across time. Further, we analyzed differences based on parental occupation to better describe how activities and behaviors vary between children in different subgroups. In conclusion, we found that activity patterns and behaviors varied little between farmworker and non-farmworker children, but varied substantially among all children across agricultural season. It is important that factors, such as activity patterns and season be considered when assessing pesticide exposure among children living in agricultural communities because these factors could contribute to variability in risk for this population.

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Highlights

Macro activity patterns of farmworker and non-farmworker children living in an agricultural community

- We compare activity patterns of children living in an agricultural community during two seasons.
- Children were more likely to engage in higher risk activities during the high-spray season.
- We found few differences in activity patterns between children of farmworkers and non-farmworkers.
- These higher risk activity patterns may be associated with increased pesticide exposure.
- Such factors should be considered when analyzing pesticide exposure in these populations.

Table 1

Demographic Characteristics of Children in an Agricultural Community Sample

	Farmworker Children (n=59)	Non Farmworker Children (n=40)	Total Sample (n=99)
Age (yrs): Median and Range	9; 6-12	9; 7-12	9.5; 6-12
Gender n (%)			
Female	28 (47%)	20 (50%)	48 (48%)
Male	32 (53%)	20 (50%)	51 (52%)
Ethnicity n (%)			
Hispanic	59 (100%)	39 (98%)	98 (99%)
Non-Hispanic	0 (0%)	1 (2%)	1 (1%)
Family Income n (%)			
Less than $5,000	1 (2%)	2 (5%)	3 (3%)
$5001 to $10,000	5 (8%)	2 (5%)	7 (7%)
$10,001 to $15,000	8 (14%)	3 (8%)	11 (11%)
$15,001 to $25,000	17 (29%)	5 (13%)	22 (22%)
$25,001 to $35,000	16 (27%)	11 (28%)	27 (27%)
$35,001 to $50,000	12 (20%)	10 (26%)	22 (22%)
More than $50,000	0 (0%)	6 (15%)	6 (6%)
Parental Language n (%)			
Only Spanish	41 (69%)	11 (27.5%)	53 (53%)
Spanish more than English	17 (29%)	13 (32.5%)	30 (30%)
Both Equally	1 (2%)	12 (30%)	13 (13%)
English more than Spanish	0 (0%)	3 (7.5%)	3 (3%)
Only English	0 (0%)	1 (2.5%)	1 (1%)
Parental Years of Residence in US n (%)			
Less than 4	1 (2%)	0 (0%)	1 (1%)
Between 4 to 9	6 (10%)	2 (5%)	8 (8%)
More than 9	52 (88%)	38 (95%)	91 (91%)
Acculturation n (%)			
No	41 (69.5%)	11 (27.5%)	52 (52%)
Yes	18 (30.5%)	29 (72.5%)	47 (47%)

Note these statistics are based on data collected during the pre-thinning season. One family was lost to follow up during the subsequent data collection period (thinning season).

Table 2

Difference of the means of Macro Activity Patterns of Children Living in an Agricultural Community by Season

	Pre-Thinning Season (n=99)	Thinning Season (n=99)		
	Mean ± SD	**Mean ± SD**	**Mean of Differences (95% CI)**	**p-Value**
Number of Hours Spent Outside (past 7 days)	18.7 ± 12.8	27.8 ± 19.5	−9.06 (−13.0, −5.1)	<0.001[a]
Number of Hours Spent Inside (past 7 days)	135.0 ± 17.8	120.7 ± 17.8	14.37 (8.4, 20.4)	<0.001[a]
Number of Hours Spent in Area Outside Home (per day)	1.7 ±2.2	3.4 ± 2.9	−1.66 (−2.4, −1.0)	<0.001[a]
Number of Hours Spent Inside Home (per day)	15.2 ± 3.5	17.4 ± 4.2	−2.19 (−3.2, −1.1)	0.001[a]
Number of Hours Spent in Area Outside School (per day)	0.9 ± 1.3	0.5 ± 1.7	0.45 (0.003, 0.9)	0.05[a]
Number of Hours Spent Inside School (per day)	5.1 ± 3.2	0.7 ± 2.1	4.42 (3.7, 5.2)	<0.001[a]
Number of Hours Spent Doing Other Activities(per day)	1.0 ± 1.4	2.1 ± 3.1	−1.02 (−1.7, −0.4)	0.002[a]
Number of days played in the field (past 7 days)	0.21± 0.9	0.93± 3.1	−0.71 (−1.4, −0.04)	0.04[a]
Number of days accompanied parent to work in the fields (past month) *(n=59 farmworker children only)*	0.015±0.12[*]	0.51 ± 1.42	−0.49 (−0.8, −0.1)	0.001[b]
	Percentage (%)	Percentage (%)	Difference	p-Value
Ever played in the fields	0.06	0.18	−0.12 (−0.22, −0.03)	0.01[c]
Ever accompanied parents to work in the fields (past month) *(n=59 farmworker children only)*	0.02	0.20	−0.18 (−0.30, −0.07)	0.001[c]

[a] p-Value from the Paired T-Test

[b] p-Value from Matched Pairs Signed Rank Test

[c] p-Value from the McNemar's Exact Test for Matched Pairs

[*] Only one child accompanied parent to fields during pre-thinning season.

Table 3

Mean Differences of Macro Activity Patterns of Children Living in an Agricultural Community by Occupation

	Pre-Thinning Season (n=99)			Thinning Season (n=99)		
	Farmworker (n=59)	Non Farmworker (n=40)		Farmworker (n=59)	Non Farmworker (n=40)	
	Mean ± SD	Mean ± SD	p-Value[a]	Mean ± SD	Mean ± SD	p-Value[a]
Number of Hours Spent Outside (past 7 days)	19.5 ± 13.1	17.5 ± 12.2	0.25	30.2 ± 20.8	24.2 ± 16.7	0.004
Number of Hours Spent Inside (past 7 days)	135.9 ± 16.9	133.8 ± 19.0	0.13	125.5 ± 23.1	113.6 ± 32.2	<0.001
Number of Hours Spent in Area Outside Home (per day)	2.0 ± 2.6	1.6 ± 1.7	0.13	3.5 ± 3.1	3.1 ± 2.6	0.19
Number of Hours Spent Inside Home (per day)	15.3 ± 3.7	15.3 ± 3.9	0.70	17.1 ± 4.3	16.6 ± 4.2	0.19
Number of Hours Spent in Area Outside School (per day)	0.8 ± 1.5	0.9 ± 1.9	0.72	0.81 ± 2.4	0.48 ± 1.4	0.25
Number of Hours Spent Inside School (per day)	4.1 ± 3.6	3.8 ± 3.4	0.28	0.85 ± 2.5	0.31 ± 1.0	0.005
Number of Hours Spent Doing Other Activities(per day)	1.8 ± 2.3	2.4 ± 3.5	0.07	1.8 ± 2.6	3.4 ± 3.9	<0.001
Number of days played in the field (past 7 days)	0.25 ± 1.0	0.15 ± 0.69	0.30	1.1 ± 3.1	0.71 ± 3.2	0.01

[a] p-Value from the Wilcoxon Sum Rank Test