Correlates of physical activity in First Nations youth residing in First Nations and northern communities in Canada

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ABSTRACT

OBJECTIVES: Physical activity (PA) can help youth achieve balance among physical, mental, emotional and spiritual dimensions of health. The objective was to identify individual, family and community factors associated with PA among First Nations (FN) youth residing in on-reserve and northern FN communities.

METHODS: Participants were 4,837 youth (12–17 years of age) responding to the 2008/10 First Nations Regional Health Survey. Through in-person interviews, youth responded to questions about moderate-to-vigorous physical activity (MVPA), participation in traditional physical activities, and individual-level, family and community factors.

RESULTS: When averaged across all days of the year, 65% of FN youth accumulated at least 60 min/day of MVPA and 48% of youth participated in at least one traditional FN PA in the previous year. Being male, having a lower number of chronic conditions, living in balance physically, living with at least one biological parent, having more relatives help youth understand their culture, having more community challenges and having more leisure/recreation facilities were independently associated with an increased likelihood of accumulating ≥ 60 min of MVPA. Younger age, being male, knowledge and use of FN language, living in balance spiritually, living with at least one biological parent, having more relatives help youth understand their culture, living in a community of ≤ 300 people, and perceiving the natural environment and community health programs as strengths were independently associated with participation in traditional FN physical activities.

CONCLUSION: There are several correlates of PA from diverse ecological levels among FN youth.

KEY WORDS: Youth; motor activity; Indigenous population; health surveys; Canada

La traduction du résumé se trouve à la fin de l'article.

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The Maskwachees Declaration acknowledges the importance of physical activity (PA) for the promotion of holistic health among Aboriginal Peoples.^{1–3} For First Nations (FN) youth, PA plays an important role in achieving balance among physical, mental, emotional and spiritual elements of health.^{4,5}

While little is known about the PA levels of FN youth, available data suggest that inactivity is prevalent. For instance, a recent study of self-reported moderate-to-vigorous physical activity (MVPA) from 204 on-reserve 10–16 year olds found that only 14% of boys and 4% of girls met public health guidelines of at least 60 accumulated minutes of daily MVPA.⁶

Understanding the factors that influence the PA behaviour of FN youth represents a first step to fostering their positive PA habits.⁷ In the mainstream literature, behaviour theories and models provide a systematic framework for examining the factors that influence PA.^{8,9} Ecological models, commonly used in the PA literature,^{8,9} and which are consistent with an Indigenous view of health and wellness, emphasize the relatedness of the self with the external world and the interconnectedness of humans to their physical, social and spiritual surroundings.^{10,11} It is thus relevant to consider influences upon PA as occurring at multiple levels of human ecology, including individual (e.g., age, gender, cultural beliefs), interpersonal (e.g., relationships and characteristics of family) and community levels (e.g., social and

economic conditions, facilities, and programs) to better inform the development of interventions to enhance PA in FN youth.¹² Gender, age, socio-economic status (SES), parent and environmental influences are among the most researched and consistent correlates of PA in youth.^{13,14} Relatively little information is available about the ecological factors that influence PA among FN youth.¹⁵

The purpose of this study was to identify individual, family and community factors independently associated with PA among FN youth aged 12–17 years. We assessed these associations in the 2008/10 Regional Health Survey (RHS), which is a large and representative sample of FN persons who reside in FN on-reserve and northern communities across Canada.

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METHODS

The RHS is a nationwide survey that addresses a holistic range of priority health issues for FN, including PA. Development of the questions was informed by FN experts from the First Nations Information Governance Centre (FNIGC) to be meaningful to FN youth. Questions were answered by youth during in-person interviews wherein local field workers, overseen by FNIGC staff, used a Computer Assisted Personal Interview (CAPI) system to record youth responses.

Participants

The RHS was designed to represent the FN population living in FN communities (e.g., on-reserve and in northern Canada above the 60th parallel) in all provinces and territories, except Nunavut. Indian and Northern Affairs Canada (INAC) registry counts were used to derive sample allocations, thereby ensuring adequate representation of the population. Within the FN communities, band membership lists were used to randomly select individuals. Overall, 216 communities were included in the RHS and 5.3% of the FN population living in FN communities was surveyed. The overall response rate among children, youth and adults was 72.5%. A total of 4,837 youth aged 12–17 years completed the RHS, representing approximately 54,000 FN youth. Data were weighted using INAC population counts, taking into account inclusion probabilities and non-response rates. Youth who answered ‘do not know’ or ‘refused’ were excluded from the study. The total weighted population represented in the final MVPA analysis was 41,664 persons (i.e., 77% of represented 12–17 year old FN youth living on-reserve and in northern FN communities). The corresponding numbers for the traditional activities analysis were 48,558 and 90% respectively.

The RHS sample design incorporated a two-stage sampling strategy. The first stage involved the selection of communities to participate in the survey. Initially, all FN communities in Canada were stratified by region, subregion, and community size [large (1,500+ people), medium (300–1,499 people), and small (<300 people)]. Large communities were automatically included, while medium and small communities were randomly selected with equal probability within their respective strata. When a randomly selected community chose not to participate, it was replaced randomly with another community in the same subregion and size grouping.

The second stage of sampling pertained to the selection of individuals within participating communities. All community members were identified using band membership lists. Community members were randomly selected within age/gender groups from these lists. When a selected community member chose not to participate, they were substituted from the ordered randomly generated list. The sampling rate within each community was determined as a function of the overall subregion probability (within regions) and the probability of selection of the community (within subregion) as per INAC registry counts.

Individual factors

Demographics. We considered age (12–14 years, 15–17 years) and gender categories.

First Nations language. Use of FN language was grouped as follows: ‘does not understand/speak a FN language’, ‘understands/speaks a FN language, but does not use most often in daily life’, and ‘use of a FN language most often in daily life’.

First Nations culture. Importance of FN culture was assessed by asking “How important are traditional cultural events in your life?” Response options were ‘very important’, ‘somewhat important’, ‘not very important’, and ‘not important’.

Living in balance. Youth were asked how often they were in balance physically, emotionally, mentally and spiritually. Four response options for each aspect were anchored by ‘almost none of the time’ and ‘all of the time’.

School attendance. Responses were grouped as ‘yes’ or ‘no’ based on school attendance.

Chronic conditions. Youth were asked whether they had 20 different chronic conditions, not including allergies. The number was summed and categorized as ‘0’, ‘1’, and ‘≥2’ chronic conditions.

Family factors

Family structure. Parental structure at home was grouped as: ‘living with both biological parents’, ‘living with one biological parent’, or ‘living with no biological parents’. The *number of people living within the household* (excluding the respondent) was grouped as ‘<3’, ‘3 or 4’, ‘5 or 6’, or ‘≥7’.

Family socio-economic status. Parents’/guardians’ highest level of education, determined by the education level of the most educated parent, was grouped as ‘<high school’, ‘high school graduate’, or ‘any post-secondary education’.

Family culture. Youth were asked “Who helps you in understanding your culture?” Responses included: parents, grandparents, aunts/uncles, and other relatives; these were summed as ‘0 relatives’, ‘1 relative’, ‘2 relatives’, or ‘≥3 relatives’.

Community factors

Community size. Respondents were considered to live within a small (<300 people), a medium-sized (300–1,499 people), or a large (≥1,500 people) FN community.

Community culture. Youth were asked “Who helps you understand your culture?”, with the following list provided: school teachers, community elders, and other community members. Responses were summed as ‘0’, ‘1’, ‘2’, and ‘≥3’ community members.

Community challenges. Youth reported whether or not their community was facing challenges in education, alcohol and drug use, housing, loss of culture, lack of employment, destruction of natural environment, poor health, lack of funding, lack of control, and gang activity. Responses were summed as ‘0 or 1’, ‘2 or 3’, ‘4 or 5’, and ‘6 or more’ community challenges.

Community strengths. Participants were asked “What are the main strengths of your community?” Responses were placed into ‘yes’ or ‘no’ groups based on whether the participants checked off each of the following areas: good leisure/recreation facilities, natural environment, and community health programs.

Table 1. Unweighted *N* and % for all variables included in the analyses

Variable	Unweighted <i>N</i>	%
Individual-level variable		
Age, years		
12–14	2326	50.0
15–17	2498	50.0
Sex		
Female	2476	48.7
Male	2361	51.3
Physical activity		
≥60 min/day of moderate-to-vigorous activity	2917	65.0
Participate in traditional First Nations activities	2276	47.7
Number of chronic conditions		
0	3392	71.6
1	906	18.4
≥2	456	10.1
Attend school		
No	465	12.3
Yes	4329	87.7
Knowledge of First Nations language		
Do not understand or speak	2039	43.7
Understand but do not use most often	1566	34.9
Understand and use most often in daily life	996	21.4
Importance: First Nations culture		
Not important	259	5.5
Not very important	507	8.8
Somewhat important	1884	40.2
Very important	1985	45.5
Live in balance physically		
Almost none of the time	286	6.6
Some of the time	872	18.4
Most of the time	1894	39.5
All of the time	1638	35.5
Live in balance emotionally		
Almost none of the time	440	10.1
Some of the time	1106	24.5
Most of the time	1830	38.7
All of the time	1290	26.6
Live in balance mentally		
Almost none of the time	660	15.5
Some of the time	863	18.9
Most of the time	1752	37.0
All of the time	1375	28.6
Live in balance spiritually		
Almost none of the time	647	14.0
Some of the time	1142	25.2
Most of the time	1651	35.8
All of the time	1203	25.0
Family-level variable		
Parental structure		
Live with no biological parents	791	16.4
Live with 1 biological parent	2224	45.6
Live with both biological parents	1821	38.2
# People in household (excluding youth)		
≥7	736	18.7
5–6	1129	24.3
3–4	1945	38.2
<3	1012	18.8
Family-level variable		
Parental education		
<High school graduate	1725	41.7
High school graduate	1178	25.2
≥Some post-secondary	1550	33.1
# Relatives who help youth understand culture		
0	954	18.1
1	1752	39.9
2	953	18.5
≥3	1177	23.5
Community-level variable		
Community size		
≥1500 people	590	7.3
300–1499 people	2585	49.6
<300 people	1662	43.1
# Community members who help youth understand culture		
0	2566	55.8
1	1467	27.6
2	569	11.6
≥3	234	5.0
# Community challenges perceived by youth		
0 or 1	1324	25.5

continues...

Table 1, continued

Variable	Unweighted <i>N</i>	%
2 or 3	1412	27.6
4 or 5	939	19.9
6 or more	1130	27.0
Leisure/recreation facilities a strength of community		
No	3893	79.9
Yes	912	20.1
Natural environment a strength of community		
No	4112	85.9
Yes	693	14.1
Community health programs a strength of community		
No	3563	72.6
Yes	1242	27.4

Physical activity

Youth were asked to report whether they had participated in 20 different common physical activities over the 12 months prior to the survey, including activities that reflect FN culture and tradition (e.g., berry picking, hunting/trapping, fishing, canoeing/kayaking). For each activity, they reported on frequency and typical duration of participation. This information was used to estimate typical weekly minutes of MVPA. Because bowling and berry picking fall below the moderate intensity range (e.g., <4 times higher than resting energy expenditure),¹⁶ these activities were removed from the MVPA calculation. Youth were placed into two groups based on degree of adherence to the MVPA guideline of 60 min per day: 'physically inactive' and 'physically active'.¹⁷ Finally, to examine PA participation through a cultural lens, 'yes' and 'no' groups were created with respect to participation in at least one of the following traditional FN physical activities: berry picking, hunting/trapping, fishing, and canoeing/kayaking.

Statistical analysis

We conducted analyses using IBM SPSS Complex Samples, version 22. All analyses took into account the multi-stage stratified design of the RHS by incorporating the design information into the models to adjust for the disproportionate and cluster sampling. Initially, we calculated descriptive statistics. Next, we used bivariate logistic regression analysis to determine whether each of the individual, family and community independent variables predicted each of the PA dependent variables (e.g., accumulate ≥60 min/day of MVPA, participate in traditional physical activities). We then conducted unconditional multivariate logistic regression analysis. We used three steps to determine the final model. First, we added all of the individual-level factors to the model. These factors were only retained for the second step (i.e., adding family factors) and third step (i.e., adding community factors) if their *p*-values were less than or equal to 0.20. Because the analyses were exploratory, we selected a $p \leq 0.20$ to ensure that we did not exclude variables in the model that could have achieved significance, but only after controlling for other variables in subsequent steps.

RESULTS

Descriptive characteristics

Table 1 provides a description of FN youth. Averaged over a year, 65% of FN youth reported engaging in an average of ≥60 min/

day of MVPA and 48% reported engaging in at least one traditional FN PA in a year.

Correlates of participation in ≥ 60 min/day of MVPA

The multivariate logistic regression analysis (Table 2) revealed that the adjusted odds ratios of participating in ≥ 60 min/day of MVPA were higher in youth who were male (OR = 1.47), had 1 chronic condition (OR = 1.55), attended school (OR = 1.50), used a FN language most often in their daily life (OR = 1.54), and lived in balance physically most (OR = 1.72) or all of the time (OR = 2.22).

As for the family factors (Table 3), the adjusted odds ratios of participating in ≥ 60 min/day of MVPA were higher in youth with parents who graduated high school (OR = 1.63) or had some

post-secondary education (OR = 1.28) and youth who had 3 or more relatives helping them understand their culture (OR = 1.85).

At the community level, the multivariate analysis results in Table 4 show that the adjusted odds ratios for participating in ≥ 60 min/day of MVPA were higher in youth who reported that their community had 6 or more challenges (OR = 1.60) and youth who perceived that the leisure/recreation facilities were a strength of their community (OR = 1.48).

Correlates of participation in traditional First Nations physical activities

As shown in Table 2, the adjusted odds ratios for engaging in traditional FN physical activities were higher in youth who were male (OR = 2.16), understand (OR = 1.57) and often use (OR = 1.55)

Table 2. Individual-level factors associated with participation in ≥ 60 min/day of moderate-to-vigorous PA and with participation in traditional First Nations physical activities in 12–17 year old youth participants of the 2008/10 First Nations Regional Health Survey

Individual-level variable	Participation in ≥ 60 min/day of MVPA			Participation in traditional First Nations physical activities		
	%*	Unadjusted OR (95% CI) [†]	Adjusted OR (95% CI) [‡]	%*	Unadjusted OR (95% CI) [†]	Adjusted OR (95% CI) [‡]
Age, years						
12–14	64.9	1 (referent)	1 (referent)	51.4	1 (referent)	1 (referent)
15–17	65.0	1.00 (0.84–1.26)	1.06 (0.86–1.29)	43.9	0.74 (0.62–0.88)	0.73 (0.61–0.87)
Sex						
Female	60.9	1 (referent)	1 (referent)	39.2	1 (referent)	1 (referent)
Male	68.7	1.41 (1.16–1.72)	1.47 (1.19–1.83)	55.8	1.96 (1.66–2.32)	2.16 (1.81–2.57)
Number of chronic conditions						
≥ 2	59.7	1 (referent)	1 (referent)	52.4	1 (referent)	N/A
1	68.1	1.44 (1.01–2.05)	1.55 (1.07–2.24)	46.4	0.79 (0.61–1.01)	
0	65.3	1.27 (0.94–1.71)	1.37 (1.00–1.89)	51.6	0.97 (0.71–1.32)	
Attend school						
No	54.9	1 (referent)	1 (referent)	43.4	1 (referent)	N/A
Yes	66.5	1.64 (1.25–2.13)	1.50 (1.11–2.02)	48.5	1.23 (0.96–1.58)	
Knowledge: First Nations language						
Do not understand nor speak	62.6	1 (referent)	1 (referent)	41.5	1 (referent)	1 (referent)
Understand, do not use most often	64.5	1.09 (0.88–1.34)	1.18 (0.95–1.45)	53.0	1.59 (1.31–1.92)	1.57 (1.22–1.97)
Understand, use most often	71.5	1.50 (1.19–1.89)	1.54 (1.19–1.99)	53.8	1.64 (1.33–2.03)	1.55 (1.28–1.92)
Importance: First Nations culture						
Not important	63.7	1 (referent)		43.0	1 (referent)	N/A
Not very important	62.2	0.94 (0.62–1.41)		42.4	0.98 (0.70–1.37)	
Somewhat important	64.2	1.02 (0.69–1.50)		44.7	1.07 (0.80–1.43)	
Very important	67.0	1.16 (0.78–1.72)	N/A	52.3	1.45 (1.08–1.95)	
Live in balance physically						
Almost none of the time	52.1	1 (referent)	1 (referent)	35.3	1 (referent)	N/A
Some of the time	52.2	1.00 (0.67–1.52)	1.04 (0.66–1.64)	41.7	1.31 (0.96–1.90)	
Most of the time	66.0	1.79 (1.22–2.62)	1.72 (1.11–2.68)	46.3	1.58 (1.11–2.24)	
All of the time	72.7	2.46 (1.67–3.62)	2.22 (1.42–3.47)	54.6	2.20 (1.52–3.19)	
Live in balance emotionally						
Almost none of the time	58.3	1 (referent)		48.3	1 (referent)	N/A
Some of the time	58.8	1.02 (0.73–1.42)		42.9	0.81 (0.58–1.11)	
Most of the time	68.4	1.55 (1.14–2.10)		48.6	1.01 (0.74–1.39)	
All of the time	68.9	1.58 (1.05–2.37)	N/A	50.4	1.09 (0.74–1.61)	
Live in balance mentally						
Almost none of the time	56.7	1 (referent)		43.8	1 (referent)	N/A
Some of the time	56.1	0.98 (0.68–1.39)		44.4	1.03 (0.80–1.32)	
Most of the time	68.8	1.68 (1.27–2.23)		47.3	1.15 (0.90–1.47)	
All of the time	70.9	1.86 (1.34–2.59)	N/A	52.6	1.43 (1.09–1.87)	
Live in balance spiritually						
Almost none of the time	55.7	1 (referent)		37.2	1 (referent)	1 (referent)
Some of the time	59.3	1.16 (0.83–1.62)		44.5	1.35 (1.00–1.82)	1.28 (0.96–1.71)
Most of the time	69.7	1.83 (1.33–2.51)		49.6	1.66 (1.25–2.20)	1.43 (1.08–1.88)
All of the time	69.5	1.82 (1.30–2.55)	N/A	53.9	1.97 (1.50–2.60)	1.68 (1.27–2.23)

*% of participation in ≥ 60 min/day in MVPA and in First Nations traditional physical activities.

[†]Unadjusted odds ratio (95% confidence interval).

[‡]Adjusted odds ratio (95% confidence interval). Adjusted for other individual-level, family and community factors.

N/A = not applicable as variable not included in final model.

Bold numbers indicate statistically significant odds ratios ($p \leq 0.05$).

Table 3. Family-level factors associated with participation in ≥ 60 min/day of moderate-to-vigorous PA and with participation in traditional First Nations physical activities in 12–17 year old youth participants of the 2008/10 First Nations Regional Health Survey

Family variable	Participation in ≥ 60 min/day of MVPA			Participation in traditional First Nations physical activities		
	%*	Unadjusted OR (95% CI) [†]	Adjusted OR (95% CI) [‡]	%*	Unadjusted OR (95% CI) [†]	Adjusted OR (95% CI) [‡]
Parental structure						
Live with no biological parents	59.2	1 (referent)	N/A	49.8	1 (referent)	1 (referent)
Live with 1 biological parent	65.0	1.28 (0.99–1.66)		44.6	0.77 (0.61–0.96)	0.66 (0.52–0.83)
Live with both biological parents	67.3	1.42 (1.10–1.85)		51.3	0.94 (0.74–1.19)	0.80 (0.64–1.00)
# People in household (excluding youth)						
≥ 7	63.8	1 (referent)	N/A	49.1	1 (referent)	N/A
5–6	65.7	1.08 (0.84–1.39)		46.9	0.91 (0.74–1.14)	
3–4	64.1	1.01 (0.79–1.29)		48.3	0.97 (0.78–1.19)	
<3	66.8	1.14 (0.87–1.50)		46.7	0.91 (0.71–1.15)	
Parental education						
<High school graduate	60.4	1 (referent)	1 (referent)	45.9	1 (referent)	N/A
High school graduate	69.8	1.52 (1.25–1.84)	1.63 (1.31–2.03)	48.0	1.09 (0.91–1.31)	
$\geq$ Some post-secondary	67.2	1.34 (1.06–1.70)	1.28 (1.00–1.62)	49.1	1.14 (0.93–1.39)	
# Relatives who help youth understand culture						
0	59.8	1 (referent)	1 (referent)	39.6	1 (referent)	1 (referent)
1	60.0	1.01 (0.79–1.30)	0.90 (0.76–1.28)	45.5	1.27 (1.03–1.58)	1.34 (1.07–1.69)
2	65.6	1.29 (0.96–1.73)	1.12 (0.81–1.56)	49.9	1.52 (1.19–1.94)	1.55 (1.19–2.02)
≥ 3	76.4	2.18 (1.63–2.94)	1.85 (1.31–2.63)	55.9	1.93 (1.52–2.46)	1.71 (1.32–2.21)

*% of participation in ≥ 60 min/day MVPA and in First Nations traditional physical activities.

[†]Unadjusted odds ratio (95% confidence interval).

[‡]Adjusted odds ratio (95% confidence interval). Adjusted for other individual-level, family, and community factors.

N/A = not applicable as variable not included in final model.

Bold numbers indicate statistically significant odds ratios ($p \leq 0.05$).

a FN language, live in balance spiritually most (OR = 1.43) or all of the time (OR = 1.68), and were lower in older youth (OR = 0.73).

At the family level, the adjusted odds ratios of engaging in traditional FN physical activities were higher in youth with one (OR = 1.34), two (OR = 1.55), or ≥ 3 relatives (OR = 1.71) helping them understand their culture. Youth living with one biological parent had lower odds (OR = 0.66) of engaging in traditional FN physical activities (Table 3).

The most relevant community factors associated with participation in traditional FN physical activities were community size, perceived natural environment, and perceived health programs of the community ($p \leq 0.05$; Table 4). Youth who lived in communities with 300–1499 people (OR = 1.45) and with <300 people (OR = 2.30) had a higher adjusted odds of engaging in traditional FN activities than youth who lived in communities with $\geq 1,500$ people.

DISCUSSION

When averaged across all days of the year, 65% of FN youth report accumulating at least 60 min/day of MVPA. This figure should be interpreted with caution as it may not mean that most FN youth are meeting current Canadian¹⁷ or global¹⁸ PA guidelines, which recommend 60 min of MVPA on a *daily* basis. Until PA is measured objectively in FN youth, true levels of daily PA will remain uncertain.¹⁹

The proportion of FN youth who participated in ≥ 60 min/day of MVPA was higher among males and those with fewer (≤ 1) chronic conditions. These findings are consistent with the mainstream literature.^{19,20} We also found that FN youth who reported feeling physically balanced ‘most of the time’ or ‘all of the time’ were more likely to participate in ≥ 60 min/day of MVPA than those who feel physically balanced ‘almost none of

the time’. A similar, albeit non-significant, pattern in the multivariate analyses was noted for the mental, spiritual and emotional aspects of health. Living in balance is an important indicator of wellness for FN peoples and our findings are consistent with previous research showing that youth who live in balance are more likely to participate in regular PA.⁴ In turn, evidence suggests that youth who regularly participate in PA and sport benefit physically, emotionally, intellectually and socially,^{21–23} further reinforcing the notion of PA as culturally meaningful “good medicine”.⁵

The connection between PA and culture was further supported by our finding at the family level, that youth with three or more relatives helping them understand their culture were more likely to participate in ≥ 60 min/day of MVPA than youth with fewer than three relatives helping them understand their culture. This finding suggests that family support for culture could be related to family support for PA, which would align with the mainstream literature showing that youth with family support for PA are typically more likely to be physically active.²⁰

When asked to identify the main challenges their communities were currently facing, youth selected from a list of ten community-level challenges, including lack of education and training opportunities, alcohol and drug abuse, housing, loss of culture, lack of employment, destruction of natural environment and resources, poor health, lack of funding, lack of control, and gang activity. Youth identifying six or more challenges in their community were more likely to participate in ≥ 60 min/day of MVPA in comparison to youth who reported that their community had one or no challenge. Although seemingly counterintuitive, it may be that communities with more challenges try to offer more PA-related opportunities and programs to counter the community challenges. In support of

Table 4. Community-level factors associated with participation in ≥ 60 min/day of moderate-to-vigorous PA and with participation in traditional First Nations physical activities in 12–17 year old youth participants of the 2008/10 First Nations Regional Health Survey

Community variable	Participation in ≥ 60 min/day of MVPA			Participation in traditional First Nations physical activities		
	%*	Unadjusted OR (95% CI) [†]	Adjusted OR (95% CI) [‡]	%*	Unadjusted OR (95% CI) [†]	Adjusted OR (95% CI) [‡]
Community size						
≥1500 people	63.8	1 (referent)	N/A	43.2	1 (referent)	1 (referent)
300–1499 people	66.5	1.12 (0.91–1.39)		50.0	1.32 (1.11–1.56)	1.45 (1.19–1.76)
<300 people	61.1	0.89 (0.67–1.18)		58.5	1.85 (1.42–2.42)	2.30 (1.17–3.17)
# Community members who help youth understand culture						
0	61.2	1 (referent)	N/A	42.7	1 (referent)	1 (referent)
1	67.2	1.30 (1.01–1.67)		52.3	1.47 (1.23–1.77)	1.11 (0.74–1.66)
2	70.6	1.52 (1.13–2.06)		58.1	1.89 (1.47–2.38)	1.74 (1.31–2.30)
≥3	80.6	2.64 (1.55–4.50)		54.8	1.63 (1.06–2.51)	1.42 (1.18–1.72)
# Community challenges perceived by youth						
0 or 1	58.7	1 (referent)	1 (referent)	43.5	1 (referent)	N/A
2 or 3	66.3	1.38 (1.10–1.74)	1.30 (1.00–1.70)	49.1	1.25 (1.01–1.54)	
4 or 5	63.6	1.23 (0.89–1.71)	1.24 (0.90–1.72)	45.8	1.10 (0.85–1.42)	
6 or more	70.2	1.66 (1.27–2.17)	1.60 (1.20–2.14)	51.8	1.39 (1.11–1.75)	
Leisure/recreation facilities a strength of community						
No	62.6	1 (referent)	1 (referent)	46.8	1 (referent)	N/A
Yes	74.2	1.72 (1.34–2.20)	1.48 (1.12–1.95)	51.6	1.21 (0.99–1.48)	
Natural environment a strength of community						
No	64.6	1 (referent)	N/A	45.8	1 (referent)	1 (referent)
Yes	67.5	1.14 (0.87–1.49)		60.0	1.78 (1.38–2.29)	1.55 (1.20–2.00)
Community health programs a strength of community						
No	63.2	1 (referent)	N/A	45.0	1 (referent)	1 (referent)
Yes	69.6	1.33 (1.09–1.63)		55.3	1.51 (1.26–1.81)	1.40 (1.17–1.67)

*% of participation in ≥ 60 min/day MVPA and in First Nations traditional physical activities.

[†]Unadjusted odds ratio (95% confidence interval).

[‡]Adjusted odds ratio (95% confidence interval). Adjusted for other individual-level, family, and community factors.

N/A = not applicable as variable not included in final model.

Bold numbers indicate statistically significant odds ratios ($p \leq 0.05$).

this notion, we found that FN youth who perceived leisure/recreation facilities as a strength of their community were more likely to participate in ≥ 60 min/day of MVPA in comparison to youth who did not report leisure/recreation facilities as a strength of their community.

Almost half of FN youth reported engaging in at least one traditional FN PA (i.e., berry picking, hunting/trapping, fishing, and canoeing/kayaking) in the previous year. Youth who were younger, male, had knowledge of a FN language, and who reported feeling spiritually balanced ‘most of the time’ or ‘all of the time’ were more likely to engage in traditional FN physical activities. The relationship between culture and physical expressions of the body is recurrent and strong in some youth, possibly reflecting the use of traditional FN activities as a way to reclaim cultural identity and to address the disenfranchising effects of colonial oppression upon the well-being of FN people.^{1–3}

The number of relatives who help youth understand their culture was important for involvement in traditional FN physical activities. Family is central in traditional Aboriginal culture²⁴ and may play an especially critical role in enhancing youth involvement in traditional FN physical activities.

Youth living in small to medium communities (i.e., fewer than 1,500 people) were more likely to have engaged in traditional FN physical activities than youth living in larger communities. It may be that there is a stronger sense of community and more conformity among community members in less-populated areas.²⁵ It is intuitive that youth who perceived the natural environment as a strength were more likely to have engaged in

traditional FN physical activities (i.e., berry picking, hunting/trapping, fishing, and canoeing/kayaking), given that these activities occur in nature. Participation in traditional FN physical activities may represent a salient way for youth to achieve balance in health and well-being. Previous evidence suggests that the integration of cultural practices and teachings in PA and sport can address the negative influences of colonization, offering a space for healing from intergenerational trauma^{2,3,5} and an opportunity to promote youth living in balance during the critical developmental stage of adolescence.²⁶

Consistent with the current findings, previous research on barriers to PA in Aboriginal youth identifies the influences as multi-level.¹⁵ Our findings confirm the relevance of examining correlates for overall and traditional PA involvement from an ecological lens.²⁰ Influences on PA involvement by FN youth were found at each of the three ecological levels considered. The theme of culture was found to cut across all levels, confirming the importance of this construct for the examination of, and eventual intervention upon, PA and well-being among FN youth.

Overall, the magnitude of the associations examined was weak to modest and some limitations might be at play. Self-reported PA is known to be over-reported and only modestly correlated to objectively measured PA.²⁷ Thus, it is likely that the proportion of the population meeting the ≥ 60 min/day MVPA target was lower than reported. Specificity about the types of traditional activities performed was also lost because response options were grouped. In addition, given that the “participation

in traditional PA" measure could reflect as little as once a year participation in a traditional activity, it should be noted as a limitation. Future studies should expand the list of traditional FN activities to reflect the variety of same (e.g., adding traditional dancing, drumming, tanning hides, etc.).

Despite these limitations, the current study provides new evidence for associations between PA in FN youth and several correlates at diverse ecological levels. Future work is needed to examine additional predictors of PA among youth living in FN communities.

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RÉSUMÉ

OBJECTIFS : L'activité physique (AP) peut aider les jeunes à trouver un équilibre entre les dimensions physique, mentale, émotionnelle et spirituelle de la santé. Notre objectif était de cerner les facteurs individuels, familiaux et communautaires associés à l'AP chez les jeunes des Premières Nations (PN) résidant dans les réserves et dans les communautés nordiques des PN.

MÉTHODE : Les participants étaient 4 837 jeunes (12-17 ans) ayant répondu à l'Enquête régionale longitudinale sur la santé des Premières Nations de 2008-2010. Au moyen d'entrevues directes, les jeunes ont répondu à des questions sur l'activité physique moyenne à vigoureuse (APMV), la participation aux activités physiques traditionnelles et les facteurs individuels, familiaux et communautaires.

RÉSULTATS : En faisant la moyenne sur tous les jours de l'année, 65 % des jeunes des PN avaient accumulé au moins 60 min/jour d'APMV, et 48 % des jeunes avaient participé à au moins une AP traditionnelle au cours de l'année antérieure. Le sexe masculin, le fait d'avoir moins de maladies chroniques, l'équilibre sur le plan physique, le fait de vivre avec au moins un parent biologique, le fait d'avoir plus de parenté pour aider les jeunes à comprendre leur culture, le nombre plus élevé de défis communautaires et le nombre plus élevé d'installations récréatives et de loisir étaient indépendamment associés à la probabilité accrue d'accumuler ≥ 60 min d'APMV. Le jeune âge, le sexe masculin, la connaissance et l'utilisation d'une langue des PN, l'équilibre sur le plan spirituel, le fait de vivre avec au moins un parent biologique, le fait d'avoir plus de parenté pour aider les jeunes à comprendre leur culture, le fait de vivre dans une communauté de ≤ 300 personnes et la perception des programmes axés sur le milieu naturel et la santé communautaire comme étant des forces étaient des facteurs indépendamment associés à la participation aux activités physiques traditionnelles des PN.

CONCLUSION : Chez les jeunes des Premières Nations, il y a plusieurs corrélats de l'activité physique à divers niveaux écologiques.

MOTS CLÉS : adolescent; activité motrice; population d'origine amérindienne; enquêtes de santé; Canada