Equity in active living among youth: Understanding the influence of school policies and programs on screen time

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COMPASS

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COMPASS is a longitudinal hierarchical research platform for evaluating how natural experiments related to changes in **school-level programs, policies and built environment** impact changes in multiple **YOUTH health behaviours and outcomes**.

DESIGN & METHODS

- Longitudinal quasi-experimental design

- 90 schools (79 in Ontario and 11 in Alberta)

- >50,000 Students between grades 9-12

- Wave 1 data collection was conducted in 2012-2013 academic year and this study utilizes data from Wave 2 (2013-2014)

- School-level data: program and policy environment and built environment characteristics within each school, and built environment characteristics in the community immediately surrounding each school

- Student-level data: obesity, healthy eating, physical activity, sedentary behaviour (**SCREEN TIME**), tobacco use, alcohol and marijuana use, school-connectedness, bullying, and academic achievement.

WHY FOCUS ON SCREEN TIME IN YOUTH?

- Inability to meet screen time guidelines was significantly associated with **overweight/obese** status regardless of meeting the physical activity guidelines (Bai et al., 2016)

- Screen time was associated with an increased likelihood of **metabolic syndrome** independent of physical activity (Janssen and Mark, 2008)

- High screen time increases the risk of **asthma**, (Protudjer et al., 2012)

- Screen time was negatively associated with **fitness** (Sandercock et al., 2013) and **isometric trunk muscle strength** (Grøntved et al., 2013)

- Video game playing and computer use, but not TV viewing were associated with depressive symptoms. High computer use was associated with approximately a 50% increased engagement in **multiple risk behaviours** (Carson et al., 2011)

STUDY-SPECIFIC DATA SOURCES

- **Screen time** (TV viewing, Computer use, video games)

- **School policies during, and after school hours**: access to indoor/outdoor physical activity areas; access to sports equipment; access to physical activity infrastructure, hours of mandatory physical education

- **School programs:** number of intramural programs/clubs that promote physical activity in each season; number of non-competitive sports clubs that promote physical activity; participation in special events (e.g.. Terry Fox Run); type and number of varsity programs (e.g. tennis, rugby)

- **Built environment** around schools: parks; open areas; amusement parks; sport goods and bike shops; physical fitness facilities; museums, galleries and gardens

- **Weather data:** Daily maximum temperature, daily precipitation, number of daylight hours

ANALYSIS

- Sex and geography-specific multilevel random-intercept linear regression models
  - ➢ 4 models: Ontario (ON) boys, Ontario girls, Alberta (AB) boys and Alberta girls

- Screen time-specific multilevel random-intercept linear regression models
  - ➢ 2 Models: ON boys and ON girls

- Main variables: school policies, programs and built environment around the schools

- Models were controlled for grade, ethnicity and weather

RESULTS

Variable	ON (N =)				AB (N =)			
	Female (n = 20388)	Male (n = 20936)	D F	Prob	Female (n = 1761)	Male (n = 1776)	D F	Prob
%(count)								
Grade								
9	26.7 (5445)	27.5 (5742)	3	0.027	15.0 (264)	15.4 (274)	3	0.697
10	26.2 (5344)	25.3 (5277)			33.0 (582)	31.3 (556)		
11	24.9 (5062)	24.4 (5099)			28.3 (499)	28.5 (505)		
12	22.2 (4511)	22.9 (4777)			23.6 (416)	24.8 (440)		
Ethnicity								
White	75.3 (15342)	73.2 (15315)	5	<.0001	74.2(1307)	72.6 (1290)	5	0.006
Black	3.2 (657)	4.9 (1033)			1.2 (21)	2.8 (50)		
Asian	5.2 (1068)	5.2 (1082)			3.4 (60)	4.4 (78)		
Indigenous	3.0 (613)	2.8 (591)			**11.1 (195)**	**10.2 (182)**		
Hispanic	1.9 (386)	2.2 (453)			0.5 (8)	0.2 (4)		
Other	11.4 (2322)	11.8 (2462)			9.7 (170)	9.7 (172)		
Weight Status								
Under	1.4 (282)	1.7 (350)	4	<.0001	1.4 (25)	1.8 (32)	4	<.0001
Healthy	61.7 (12574)	52.6 (11021)			58.0 (1022)	50.0 (888)		
Overweight	11.4 (2332)	16.7 (3493)			11.8 (208)	16.9 (300)		
Obese	4.1 (838)	8.3 (1734)			**6.0 (105)**	**10.1 (180)**		
Mean(SD)								
AGE	15.6(1.2)	15.6(1.3)		0.0003	15.8(1.1)	15.9(1.1)		0.001
TV (min/day)	121.4(89.1)	118.1(90.6)		0.0002	115.1(88.4)	117.3(93.2)		0.464
Inter. Surfing (min/day)	**139.1(123.5)**	113.2(112.9)		<.0001	**123.6(125. 7)**	100.2(109.1)		<.0001
Video Game (min/day)	37.2(77.3)	**121.0(119.8)**		<.0001	43.4(82.8)	**120.9(119.2)**		<.0001

TOTAL SCREEN TIME

- Visible minorities have consistently higher screen time: ON and AB boys and girls

- Regular access to INDOOR physical activity areas during non-instructional school time is associated with lower screen time: ON girls

- Presence of gymnasiums is associated with lower screen time: AB boys

- Varsity programs are associated with lower screen time:
    - Swimming: ON boys
    - Tennis: ON girls
    - Football: AB girls

- Presence of physical fitness facilities around schools is associated with lower screen time: ON boys

- Higher daily maximum temperature is associated with lower screen time: ON boys and girls

TV vs. COMPUTER TIME

TV

- Except youth who identified as Asian, all **visible minorities** are consistently associated with higher TV time: ON boys and girls
- Boys who identified as **Asian** had lower TV time
- Presence of **physical fitness facilities** around schools is associated with lower TV time: ON boys
- **Varsity programs** are associated with lower TV time:
  ➢ Swimming: ON boys; Rugby: ON girls

Computer time

- **Visible minorities** are associated with higher computer time: ON boys and girls
- Presence of **physical fitness facilities** around schools is associated with lower computer time: ON boys
- **Varsity programs** are associated with lower computer time:
  ➢ Swimming: ON boys; Rugby: ON girls; Track and Wrestling: ON girls
- Presence of **museums** around schools is associated with lower computer time: ON girls

Consistency of evidence across ON and AB

- Targeted policy and programming to reduce screen time in visible minorities

ON-Specific evidence

- Design built environment to facilitate physical fitness facilities around schools

Variation of evidence between different types of screen time

- There is a need to factor in video games time as an outcome variable

Variation of evidence between boys and girls

- There is a need to inform sex-specific varsity programming

- Conduct analyses with videogames as one of the key outcome variables.

- Conduct longitudinal analyses to understand the influence of changing school policies and programs on screen time

- Provide evidence that would inform COMPASS School-Specific Health Profiles

- School health profiles are annual knowledge translation reports that provide schools with: a) evidence-based suggestions for policies and programs; b) suggestions for curriculum supplements aimed at improving student awareness and knowledge

- Specific to screen time, translate knowledge to schools regarding high-risk groups (**visible minorities**), sex and geography-specific school policies and programs (**indoor physical activity facilities and varsity programs**), and built environment around the schools (**physical fitness facilities**)

- Finally, identify potential overlap between these negative/positive screen time determinants with other youth behaviours to provide schools comprehensive preventive strategies.

Thank you!

Questions?

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