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## Original quantitative research

# Availability of health-promoting interventions in high schools in Quebec, Canada, by school deprivation level

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### Abstract

**Introduction:** School-based health-promoting interventions (HPIs) foster adolescent health and well-being. Access to HPIs may differ by the socioeconomic advantage of students at each school (school deprivation). We assessed the importance of health issues and availability of HPIs and extracurricular activities by school deprivation in high schools in Quebec, Canada.

**Methods:** In 2016/17, 2017/18 and 2018/19, we interviewed school principals or a designee in 48 public high schools classified as disadvantaged (33%) or advantaged (67%). Schools rated whether 13 common health-related issues were important (i.e. warranted intervention) in their student population and reported whether HPIs to address these or other health issues and/or sports or special interest extracurricular activities had been available in the past year.

**Results:** 84% of disadvantaged schools offered one or more HPIs in the past year compared to 73% of advantaged schools. Higher proportions of disadvantaged schools perceived most of 13 health-related issues as important. HPIs for bullying/exclusion, sex education and physical activity (issues subject to government mandates) were available in most schools. Higher proportions of disadvantaged schools offered non-mandated HPIs (i.e. for healthy eating, mental health/well-being and substance use). Higher proportions of advantaged schools offered extracurricular activities in all areas other than non-competitive sports, which was offered by equal proportions of advantaged and disadvantaged schools.

**Conclusions:** Government mandates appear to facilitate universal availability of HPIs in schools, possibly boosting equity in school-based health promotion. Further investigation of possible differences in the content, implementation and/or effects of HPIs based on school deprivation is warranted.

**Keywords:** *adolescents, social inequalities, cross-sectional studies, physical activity, sex education, healthy eating, substance use*

### Introduction

After decades of being considered secondary to maternal and child health, the promotion and protection of adolescent health are now recognized as warranting specific consideration and government funding.

Attitudes, beliefs and habits that impact health and well-being in adulthood often become entrenched during adolescence, and early health promotion efforts can positively influence these attributes.<sup>1</sup> The World Health Organization underscored the importance of developing and implementing

### Highlights

- Higher proportions of disadvantaged schools considered unhealthy eating, alcohol use, cigarette smoking, aggressive behaviour and sexually transmitted infections (STIs) as important health issues; higher proportions of advantaged schools considered suicide risk and self-harm as important health issues.
- 84% of disadvantaged schools reported offering one or more health-promoting interventions (HPI) in the past year, compared to 73% of advantaged schools.
- HPIs for bullying/exclusion, sex education and physical activity (themes subject to government mandates) were available in most schools.
- Notably higher proportions of disadvantaged schools offered HPIs related to healthy eating, mental health and well-being and substance use.
- Most schools offered different extracurricular activities, but a higher proportion of advantaged schools offered extracurricular activities of all types except non-competitive sports, which were offered by equal proportions of advantaged and disadvantaged schools.

health-promoting interventions (HPIs) for youth in its call to action to “improve and maintain the health of the world’s one billion adolescents.”<sup>2,p.1</sup>

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Schools are ideal settings for promoting adolescent health because most youths attend school. In 2020/21, 96%, 94% and 78% of Canadians aged 15, 16 and 17 years, respectively, attended high school.<sup>3</sup> In the Canadian province of Quebec, in 2019/20, 98%, 97%, 97% and 93% of adolescents aged 14, 15, 16 and 17 years, respectively, were enrolled in school (Ministère de l'Éducation et de l'Enseignement supérieur du Québec, internal data, 25 August 2022).

Drawing on the principles of the Ottawa Charter for Health Promotion, the Health-Promoting Schools framework is increasingly recognized for its potential to support positive development and healthy behaviours in adolescents.<sup>4,5</sup> This framework aims to promote health and learning using three main approaches: health promotion through the school curriculum and activities, health promotion through the social and physical environment, and involvement of families and the community.<sup>6</sup>

Inherent in these approaches is the importance of adaptation to school context. School stakeholders are intended to identify needs in their school and introduce interventions to address these needs so that all interventions are tailored to the school context.<sup>7</sup> Delivering HPis to foster adolescent health through schools optimizes universal access across all socioeconomic settings and supports the goals of the World Health Organization initiative of “making every school a health promoting school.”<sup>8</sup> Health and education ministries in all Canadian provinces and territories have committed to promoting health in schools.<sup>9</sup>

Government mandates may be key to ensuring equitable access to HPis. In 2012, all schools in Quebec were required to address bullying and exclusion through HPis and/or school policies.<sup>10</sup> In 2018, the provincial government mandated delivery of school-based HPis targeting sex education,<sup>11</sup> and in 2017, a province-wide policy was adopted encouraging adolescents to engage in physical activity for at least 60 minutes/day.<sup>12</sup>

To fulfil these mandates, school boards and schools have broad discretion in HPI content, format and delivery. In addition to the health issues signalled as important by government mandates, schools can identify other areas of concern and

develop or adopt HPis to address these additional concerns.

School-sponsored extracurricular activities complement the educational curriculum and provide opportunities for students to engage voluntarily in pursuits such as individual and team sports, music and art, and special interest clubs.<sup>13</sup> Participation in extracurricular activities can help young people learn new skills, boost academic performance, broaden social skills and improve time management skills.<sup>14</sup> We considered extracurricular activities as well as HPis on the premise that these activities could complement each other in creating a health-promoting school.

The Health Promoting Schools framework, which guided this study, is recognized as the most promising approach to building healthy school communities.<sup>15</sup> Nevertheless, although the framework supports equity by emphasizing a whole-school approach, it does not explicitly mention the equitable distribution of HPis across schools. Despite known challenges in disadvantaged schools (e.g. lack of resources, work overload)<sup>16,17</sup> and government mandates, there is little empirical evidence that school-based HPis are equitably available across different socioeconomic settings.<sup>18,19</sup>

Our objectives were to describe the perceived importance of student health issues among school staff and the availability of related HPis and extracurricular activities in Quebec public high schools, according to school deprivation.

## Methods

Project PromeSS comprises two cross-sectional surveys that investigate social inequalities in HPI availability in primary and high schools across Quebec. In phase 1 (2016–2019), data were collected via a telephone survey of elementary and high school administrators.<sup>19,20</sup> The second phase (2023–2024) extends phase 1 in a second cross-sectional survey to determine whether the availability of HPis and extracurricular activities has changed since the start of the COVID-19 pandemic.<sup>20</sup> In the current study, we drew data from the first survey to address our study objectives.

## Study population

Recruitment of schools occurred in two stages. First, we contacted 69 of the 72 school boards within the Ministère de

l'Éducation et de l'Enseignement supérieur (MEES)<sup>21</sup> in 2016 for permission to invite schools under their purview to participate in PromeSS. Because the MEES does not assign a deprivation indicator from the Indice de milieu socio-économique (IMSE) to private schools, schools serving only special needs students or schools with 30 or fewer students, we did not include these schools in our study. The 69 school boards approached oversaw 436 high schools.

Approval was obtained from 32 school boards (46%) overseeing 170 high schools (39% of all public high schools in Quebec); 31 school boards declined and 6 did not respond. Once approval was obtained, we mailed/emailed an introductory letter advising each eligible school that we would be contacting them by telephone. One week later, a team member (i.e. a retired principal who had worked in the Quebec school system for three decades) contacted each school principal to ask for assent to participate. Contact was established with school principals in 77 high schools (42% of high schools in consenting school boards); 48 assented and completed the interview. These 48 schools represented 28% of high schools in the participating school boards and 11% of all eligible high schools in Quebec.

## Procedures

Data were collected during the 2016/17, 2017/18 and 2018/19 school years via structured telephone interviews with school principals or a designee (who had to have been in their current position for at least 6 months). We had previously tested the interpretability of the questions by asking nine retired school principals to narrate their thoughts as they interpreted and formulated responses to the questions. Interviews (median length: 52 minutes) were conducted by trained interviewers in French or English.

## Ethics approval

The Centre de recherche du Centre hospitalier de l'Université de Montréal Ethics Review Committee approved the study. The ethics approval certificate (2013-4130, CE 12.307) was submitted to all school boards and to school principals on request.

## Interview questions

### Perceived importance of health issues

We assessed the perceived importance of health issues based on responses to the

question, “In the past year, how important was each of the following health issues for students? That is, would the issue require special attention or intervention within your school?” The question was followed by a list of 13 health issues common among high school students, selected from domains assessed in the Health Behaviour in School-aged Children study of Canadian adolescents in Grades 6 to 10 (i.e. physical activity/sedentary behaviour, mental health problems, healthy/unhealthy eating habits, substance use (including drugs, alcohol and tobacco), bullying/cyberbullying, aggressive behaviour, sexual health).<sup>22</sup> We also included attention deficit hyperactivity disorder (ADHD), which affects 5–7% of youth worldwide<sup>23</sup> and is associated with adverse outcomes academically and vocationally.<sup>24</sup>

Response options “extremely important,” “very important” and “important” were coded as important; “not very important” and “not at all important” were coded as not important.

#### **Availability of health-promoting interventions**

We assessed the availability of HPIs based on yes/no responses to the question, “In the past year, has your school offered any health-promoting interventions in which participation is expected at the group, class, grade or school-level to address.....?” The question was followed by a list of eight themes: physical activity/active living (not including physical education classes that are part of the curriculum); sex education (e.g. teen pregnancy, sexually transmitted infection [STI] prevention, etc.); bullying/exclusion; healthy eating; personal safety and injury prevention (e.g. potential risks at home, in community, outdoors; safe use of technology); mental health/well-being; substance use (including drugs, alcohol and tobacco); and other.

#### **Availability of extracurricular activities**

We assessed the availability of extracurricular activities with yes/no responses to the question, “In the past year, has your school offered any of the following types of extracurricular activities in which participation is voluntary?” The list of seven possible options included competitive sports (extramural); non-competitive sports (intramural); physical activities (e.g. dance, ski, martial arts, fitness class); free gym; special interest clubs (e.g. chess, math,

computer coding, robotics); artistic clubs (e.g. music, theatre, art); and other.

#### **School deprivation level**

We based classification of school deprivation level on the IMSE school deprivation index assigned by the MEES to all public schools with 30 students or more. The IMSE reflects the degree to which students in each school are socioeconomically advantaged or disadvantaged. The index takes into account whether both parents are employed and whether mothers completed high school.<sup>25</sup> Schools are assigned a decile rank from 1 (least deprived/advantaged) to 10 (most deprived/disadvantaged). We classified schools with IMSE between 8 and 10 as disadvantaged and those with IMSE between 1 and 7 as advantaged.

Additional school characteristics included number of students (range: 13–2835), number of teachers (range: 4–225), teacher turnover in the past 3 years (none/few = low; some/several = high), turnover of the principal in the past 3 years (0–1 principal change = low;  $\geq 2$  = high), language of instruction (French, English) and proportion of students identified by school staff as being at risk of poor academic outcomes because of physical disabilities, behavioural difficulties, social maladjustment or learning difficulties that might affect learning or behaviour (range: 7.5–100%).

Using data from the 2016 Canadian Census, we matched school postal codes to population centres categorized as rural (population < 1000), small (1000–29999), medium (30000–99999) or large ( $\geq 100000$ ).<sup>26</sup> We grouped schools into two categories: rural/small or medium/large. School principal/designee characteristics included sex, level of education, current position (principal, vice-principal, teacher, other) and number of years working in their current positions.

#### **Data analysis**

We report the proportion of disadvantaged versus advantaged schools that viewed each health issue as important; that offered each HPI; and that offered each extracurricular activity. Because this is a descriptive study, we followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines to omit statistical testing.<sup>27</sup>

## **Results**

The mean (standard deviation [SD]) age of interviewees was 46.6 (6.9) years; 56% were female, and 58% had a postgraduate diploma/certificate or degree. Most ( $n = 29$ ) were school principals; 5 were vice-principals, 8 were teachers and 6 had other roles. On average, interviewees had worked in their current position for 8.5 (2.7) years; 63% had more than 10 years experience.

Of the 48 study schools, 16 (33.3%) were classified as disadvantaged (i.e. serving disadvantaged students). The remainder were classified as advantaged (i.e. serving moderately to highly advantaged students).

Table 1 presents characteristics of participating schools compared with all high schools in Quebec, when possible. PromeSS schools resembled all high schools across Quebec in school deprivation, language and number of students.

#### **Importance of health issues**

Regardless of school deprivation level, the top six health concerns that schools considered important (i.e. warranting special attention and/or intervention) were ADHD, mental health problems, bullying, lack of physical activity, unhealthy eating and substance use. ADHD and problems related to mental health were considered important by 90% and 83%, respectively (see Table 2). Fewer, although still a majority (65–69%), perceived bullying, lack of physical activity, unhealthy eating and drug use as problematic. Half of the schools considered alcohol use (48%), cigarette smoking (46%) and suicide risk (46%) as important problems. About one-third or less reported that aggressive behaviour (38%), self-harm (29%), STIs (27%) and teen pregnancy (17%) were important problems in their school.

Higher proportions of disadvantaged schools reported that unhealthy eating (75% vs. 59%), alcohol use (56% vs. 44%), cigarette smoking (56% vs. 41%), aggressive behaviour (50% vs. 31%) and STIs (38% vs. 22%) were important health issues. Higher proportions of advantaged schools reported that suicide risk (50% vs. 38%) and self-harm (34% vs. 19%) were important.

**TABLE 1**  
**Characteristics of high schools retained in the sample compared to all high schools in Quebec, Project PromeSS, 2016–2019**

| Characteristic   | PromeSS schools<br>(n = 48) | All high schools<br>in Quebec<br>(n = 436) |
|--|-----------------------------|--|
| School deprivation, % <sup>a,b,c</sup>                     |                             |  |
| Advantaged schools   | 66.7                        | 60.5                                       |
| Disadvantaged schools                                      | 33.3                        | 39.5                                       |
| Language of instruction in school board, % <sup>a,b</sup>  |                             |  |
| French   | 83.3                        | 87.0                                       |
| English  | 16.7                        | 13.0                                       |
| Median no. of students (IQR)                               | 713 (799)                   | 608 (726)                                  |
| Median no. of teachers (IQR)                               | 57 (56.5)                   | N/A  |
| Size of school community, % <sup>a</sup>                   |                             |  |
| Rural/Small  | 45.8                        | N/A  |
| Medium/Large   | 54.2                        | N/A  |
| Mean per cent students in single-parent households, % (SD) | 42.6 (17.3)                 | N/A  |
| Mean per cent students in low-income families, % (SD)      | 39.7 (26.0)                 | N/A  |
| Mean per cent students at risk, % (SD)                     | 43.0 (24.2)                 | N/A  |
| High teacher turnover, % <sup>a,d</sup>                    | 54.2                        | N/A  |
| High principal turnover, % <sup>a,d</sup>                  | 14.6                        | N/A  |

**Abbreviations:** IQR, interquartile range; N/A, not available; SD, standard deviation.

<sup>a</sup> Denominators exclude missing data.

<sup>b</sup> Data extracted from published governmental reports.

<sup>c</sup> Based on the Indice de milieu socio-économique (IMSE) school deprivation index assigned by the Ministère de l'Éducation et de l'Enseignement supérieur (MEES).

<sup>d</sup> Some/several in the past 3 years.

### HPI availability

The proportion of schools offering HPIs was higher for issues subject to government mandates. HPIs addressing sex education and bullying/exclusion were available in 94% and 89% of schools, respectively, and 79% offered HPIs relating to physical activity/active living (see Table 3). Although not mandated, HPIs addressing personal safety and injury prevention and healthy eating were offered by 81% and 77% of schools, respectively. Two-thirds of schools offered HPIs focussed on mental health/well-being and substance use. Only 57% of schools offered tobacco control HPIs.

The mean (95% CI) proportion of disadvantaged schools offering HPIs was 84% (75–93%) compared to 73% (64–82%) of advantaged schools. A higher proportion of disadvantaged schools offered HPIs related to healthy eating (88% vs. 71%), mental health/well-being (75% vs. 61%) and drug use (75% vs 59%) (see Table 3).

### Availability of extracurricular activities

Most schools offered an array of extracurricular activities. Except for non-competitive sports, which was offered by equal proportions of advantaged and disadvantaged schools, a higher proportion of advantaged schools offered extracurricular activities in all areas (see Table 4).

### Discussion

In this study, we sought to describe health issues that school personnel perceived as important enough to warrant intervention in their school and whether related HPIs and extracurricular activities were distributed equitably in high schools across Quebec. Five key findings emerged:

(1) Disadvantaged schools reported that unhealthy eating, alcohol use, cigarette smoking, aggressive behaviour and STIs were important, whereas advantaged schools reported that suicide risk and self-harm were important.

(2) A higher proportion (84%) of disadvantaged schools had offered one or more HPIs in the past year compared to 73% of advantaged schools.

(3) HPIs addressing bullying/exclusion, sex education and physical activity, that is, issues subject to government mandates, were available in most schools;

(4) Higher proportions of disadvantaged schools offered HPIs related to healthy eating, mental health and well-being and substance use.

(5) Most schools offered an array of extracurricular activities, but a higher proportion of advantaged schools offered activities in all areas other than non-competitive sports, which was offered by equal proportions of advantaged and disadvantaged schools.

### Social inequalities

Despite marked differences in the perceived importance of numerous health issues in disadvantaged versus advantaged high schools in Quebec, we did not find evidence of inequalities in HPI availability. In fact, a higher proportion of disadvantaged schools offered one or more HPIs in the past year, and higher proportions of disadvantaged schools offered healthy eating, mental health/well-being and substance use/tobacco control HPIs. At least two explanations may underpin this finding.

First, regardless of school deprivation, most high schools in Quebec appear to meet their government-mandated responsibility to offer HPIs in specific areas, although the differences between the perceived importance of several health-related issues and HPI offerings are noteworthy. For example, 89% of schools offered bullying/exclusion HPIs, although only 67% cited bullying as important; and 79% of schools offered physical activity/active living HPIs, although only 69% cited lack of physical activity as important. It may be useful to explore the reasons for these discrepancies in perception and application.

Overall, data suggest that government mandates promote equitable access to HPIs across the spectrum of student socioeconomic advantage. However, we did not assess the frequency or intensity of the HPIs, their implementation or their impact.

**TABLE 2**  
**Proportion of schools that perceived specific health issues as important, by school deprivation level, Project PromeSS, 2016–2019**

| Health issue                       | Total, % | Disadvantaged schools <sup>a</sup><br>(n = 16)<br>% (95% CI) <sup>b</sup> | Advantaged schools <sup>a</sup><br>(n = 32)<br>% (95% CI) <sup>b</sup> |
|------------------------------------|----------|---|--|
| ADHD                               | 90       | 88 (63–98)  | 91 (75–98)   |
| Problems with mental health        | 83       | 88 (63–98)  | 81 (64–91)   |
| Lack of physical activity          | 69       | 75 (50–90)  | 66 (48–80)   |
| Bullying (including cyberbullying) | 67       | 63 (40–83)  | 69 (51–82)   |
| Unhealthy eating                   | 65       | 75 (50–90)  | 59 (42–75)   |
| Drug use                           | 65       | 63 (40–83)  | 66 (48–80)   |
| Alcohol use                        | 48       | 56 (33–77)  | 44 (26–61)   |
| Cigarette smoking                  | 46       | 56 (33–77)  | 41 (25–58)   |
| Suicide risk                       | 46       | 38 (18–61)  | 50 (34–66)   |
| Aggressive behaviour               | 38       | 50 (28–72)  | 31 (18–49)   |
| Self-harm                          | 29       | 19 (6–44)   | 34 (20–52)   |
| STIs                               | 27       | 38 (18–61)  | 22 (11–39)   |
| Teen pregnancy                     | 17       | 19 (6–44)   | 16 (6–32)  |

**Abbreviations:** ADHD, attention deficit hyperactivity disorder; CI, confidence interval; STI, sexually transmitted infection.

<sup>a</sup> All schools with ≥30 students across Quebec are ranked in deciles according to a province-wide school deprivation indicator (IMSE), with scores ranging from 1 (not deprived) to 10 (very deprived). Schools were grouped into two categories based on the IMSE score: “disadvantaged schools” (IMSE 8–10) serving disadvantaged students, and “advantaged schools” (IMSE 1–7) serving advantaged students.

<sup>b</sup>95% Agresti–Coull (modified Wald) confidence intervals.

It is possible that despite equivalence in availability, these other aspects differ across student socioeconomic status.

Second, it is possible that the greater availability of several HPIs in disadvantaged schools reflects recognition by school personnel that students in their schools needed interventions in these areas and that they had the will and

resources to implement HPIs that responded to these needs. This greater availability of HPIs in disadvantaged schools would have a positive impact if the offered interventions improved students’ health and well-being.

### Sex education

Sex education was widely offered in Quebec high schools in response to

**TABLE 3**  
**Proportion of schools that offered health-promoting interventions in the past year according to school deprivation level, Project PromeSS, 2016–2019**

| Health-promoting intervention         | Total, % | Disadvantaged schools <sup>a</sup><br>(n = 16)<br>% (95% CI) <sup>b</sup> | Advantaged schools <sup>a</sup><br>(n = 32)<br>% (95% CI) <sup>b</sup> |
|---------------------------------------|----------|---|--|
| Physical activity/active living       | 79       | 75 (50–90)  | 81 (64–91)   |
| Sex education                         | 94       | 100 (77–103)  | 90 (74–97)   |
| Bullying/exclusion                    | 89       | 94 (70–101)   | 87 (71–95)   |
| Healthy eating                        | 77       | 88 (63–98)  | 71 (53–84)   |
| Personal safety and injury prevention | 81       | 81 (56–94)  | 81 (64–91)   |
| Mental health/well-being              | 66       | 75 (50–90)  | 61 (44–76)   |
| Substance use                         | 65       | 75 (50–90)  | 59 (42–75)   |
| Tobacco control                       | 57       | 63 (40–83)  | 55 (38–71)   |

**Abbreviation:** CI, confidence interval.

<sup>a</sup> All schools with ≥30 students across Quebec are ranked in deciles according to a province-wide school deprivation indicator (IMSE), with scores ranging from 1 (not deprived) to 10 (very deprived). Schools were grouped into two categories based on the IMSE score: “disadvantaged schools” (IMSE 8–10) serving disadvantaged students, and “advantaged schools” (IMSE 1–7) serving advantaged students.

<sup>b</sup>95% Agresti–Coull (modified Wald) confidence intervals were calculated.

government mandate, but STIs and teen pregnancy were generally perceived as unimportant issues, perhaps signalling some complacency regarding teen sexual health. Tremendous progress has been made on teen pregnancy in recent decades. The fertility rate among women in Canada aged 15 to 19 years fell from 17 per 1000 females in 2000 to 5.5 in 2020,<sup>28</sup> likely reflecting changes in social norms, better access and public acceptance of adolescents’ use of contraception and sex education (Institut national de santé publique du Québec, 2 May 2022, personal communication).

However, the prevalence of STIs has risen sharply. Between 2008 and 2017, the prevalence of chlamydia, gonorrhea and infectious syphilis increased by 10%, 38% and 86%, respectively, among adolescent Canadians.<sup>29</sup> Motivating adolescents to protect themselves against STIs (e.g. through condom use) is vital. Although the Canadian Paediatric Society in 2018 endorsed long-acting reversible contraceptive methods as the primary option for youth contraception,<sup>30</sup> female high school students in the USA who used these methods were 60% less likely to also use condoms than peers who used oral contraceptives.<sup>31</sup> Moreover, 13% of adolescents reported difficulty accessing their preferred method of contraception, citing cost and access to confidential care as primary barriers.<sup>32</sup> Adequate sex education remains a key public health imperative in this vulnerable population, and health promotion efforts depend on universal delivery of effective school-based programs.<sup>33</sup>

### Mental health and substance use

Most of the schools considered mental health problems to be important. Experiencing adversity (e.g. parental divorce, family violence, abuse and neglect, economic hardship) is common among youth. In a national sample of 10 000 US adolescents (aged 13–17 years), more than half encountered at least one childhood adversity and 70% to 98% reported multiple adversities, which were strongly associated with diagnoses of post-traumatic stress disorder, dysthymia and major depression, ADHD and alcohol abuse/dependence.<sup>34</sup> Although numerous school-based HPIs aimed at improving mental health have been evaluated,<sup>35,36</sup> one-third of high schools in our sample did not offer HPIs related to mental health/well-being or to alcohol, tobacco or drug use.

**TABLE 4**  
**Proportion of schools that offered extracurricular activities in the past year according to school deprivation level, Project PromeSS, 2016–2019**

| Extracurricular activities | Total, % | Disadvantaged schools <sup>a</sup>  | Advantaged schools <sup>a</sup>     |
|----------------------------|----------|-------------------------------------|-------------------------------------|
|                            |          | (n = 16)<br>% (95% CI) <sup>b</sup> | (n = 32)<br>% (95% CI) <sup>b</sup> |
| Competitive sports         | 92       | 81 (56–94)                          | 97 (83–101)                         |
| Non-competitive sports     | 81       | 81 (56–94)                          | 81 (64–91)                          |
| Physical activities        | 88       | 75 (50–90)                          | 94 (79–99)                          |
| Free gym                   | 79       | 69 (44–86)                          | 84 (68–94)                          |
| Special interest clubs     | 85       | 69 (44–86)                          | 94 (79–99)                          |
| Artistic clubs             | 92       | 81 (56–94)                          | 97 (83–101)                         |

**Abbreviation:** CI, confidence interval.

<sup>a</sup> All schools with  $\geq 30$  students across Quebec are ranked in deciles according to a province-wide school deprivation indicator (IMSE), with scores ranging from 1 (not deprived) to 10 (very deprived). Schools were grouped into two categories based on the IMSE score: “disadvantaged schools” (IMSE 8–10) serving disadvantaged students, and “advantaged schools” (IMSE 1–7) serving advantaged students.

<sup>b</sup> 95% Agresti–Coull (modified Wald) confidence intervals.

Mandating school-based HPIs to promote mental health/well-being and prevent substance use may be pivotal to reducing the notably high health care and societal burden attributable to these issues.<sup>37</sup> Moreover, facilitating universal access across all socioeconomic settings to HPIs that focus not only on preventing mental illness but also on promoting resilience and general emotional well-being<sup>38</sup> will support recovery from the effects of the COVID-19 pandemic, which jeopardized adolescents’ mental health/well-being and heightened socioeconomic inequalities.<sup>39–41</sup>

Suicide risk and self-harm reflect mental health and well-being. Suicide is the second leading cause of death among 15-to-34-year-old Canadians.<sup>42</sup> Although adolescents are less likely than young adults to die after attempting suicide, adolescent females are more likely than their older counterparts to be hospitalized with a self-inflicted injury.<sup>42</sup> Moreover, suicide attempts and deaths are related to socioeconomic disadvantage. Individual (e.g. low parental education) and contextual (e.g. characteristics of the neighbourhood or community) socioeconomic disadvantage increases the risk for suicidal ideation, attempts and deaths.<sup>43–45</sup> Development and implementation of school-based HPIs that increase emotional resilience, coping skills and self-efficacy might mitigate these risks.<sup>46</sup>

However, suicidal ideation and self-harming behaviours can be hidden from view,<sup>47</sup> and are more difficult to notice than risky behaviours (e.g. substance use, impaired or distracted driving) or other mental

health concerns (e.g. inability to focus, anxiety, depression, aggression or conduct disorder problems) that school personnel can observe. This may have contributed to our finding that many schools, regardless of school deprivation level, did not identify suicide and self-harm as important issues. Schools may not have experienced a suicide or suicide attempt by a student, and more frequently observed issues might take precedence. Staff training around HPIs focussed on mental health/well-being should incorporate information that can help them identify adolescents at risk of suicide and self-harm and assist them in finding necessary help.<sup>47</sup>

Finally, two-thirds of schools cited drug use, and almost half cited alcohol use and cigarette smoking as important health issues. Similar proportions (two-thirds and half) reported that HPIs for drug use and tobacco control, respectively, had been offered in their school in the past year. Given the long-standing pervasiveness of “experimentation” with substance use among adolescents, the recent surge in e-cigarette use, cannabis legalization in Canada in 2018, as well as growing concerns about concurrent use of multiple psychoactive substances, it may be time to reflect on whether universal access to HPIs addressing substance use is a prudent public health policy.

### Future research

Research is needed in other provinces and territories to document school personnel’s perceptions of important student health

issues and availability of related HPIs and extracurricular activities; to examine HPI implementation practices, barriers and facilitators; and to study student-level outcomes relevant to HPIs implemented in their schools. Continued research documenting differences in HPIs across disadvantaged and advantaged schools may help inform the content and targeting of school-based health promotion.

### Limitations

The small sample size in PromeSS limits the precision of our findings. PromeSS recruited a convenience sample of high schools. Although similar in several characteristics to all high schools in Quebec, the PromeSS sample may not have been fully representative.

We interviewed a single person in each school who may not fully represent the organizational perspective. However, the questionnaire was sent to school principals before the interview so that they could consult their staff to prepare. Finally, we collected data prior to the COVID-19 pandemic, and the findings may not reflect the availability of HPIs during or post-pandemic.

### Conclusion

Although our findings need replication in other provinces and territories to be generalizable, the results suggest that government mandates facilitate universal availability of HPIs in schools, possibly contributing to boosting equity in access to school-based health promotion. Further study is needed to investigate possible differences in the content, implementation and/or effects of HPIs based on school deprivation. If HPI availability and/or impact differ by school deprivation, this variation may need to be considered by program and policy planners.

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## Conflicts of interest

The authors have no financial relationships relevant to this article and no conflicts of interest to disclose.

## Authors' contributions and statement

JK: Conceptualization, Data curation, Writing – review & editing. TR: Project administration, Investigation, Data curation, Writing – review & editing.

RJW: Writing – original draft, Writing – review & editing.

JOL: Conceptualization, Funding acquisition, Resources, Investigation, Data curation, Formal analysis, Writing – review & editing.

KM: Writing – original, Writing – review & editing.

All authors read and approved submission of the final version of the manuscript and agree to be accountable for all aspects of the work.

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