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School-based Physical Activity Interventions in High Schools: The Perceptions of School Stakeholders

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Abstract

This study aimed to identify the facilitating factors, barriers, needs and priorities of high school stakeholders in relation to the implementation of physical activity interventions targeting students in school context. A total of 66 school stakeholders participated in individual semi-structured interviews. Thereafter, 23 of these 66 participants participated in focus groups where they needed to reach consensus on the prioritization of their community's needs. The data collected were then classified according to the five levels of factors of the socio-ecological model. Results indicate that most of the facilitating factors, barriers, needs, and priorities identified was related to the institutional level. Moreover, our results show that the needs reported are specific to each school environment. This study resulted in the categorization of facilitating factors, barriers, needs and priorities, which becomes an essential resource in the development of interventions aimed at encouraging the practice of physical activities by students in school context.

Keywords: school context; physically active lifestyle; socio-ecological model; Facilitating factors; barriers.

Résumé

L'objectif de la présente étude était d'identifier les facteurs facilitants, les obstacles, les besoins et les priorités des intervenants des écoles secondaires en lien avec la mise en place d'interventions visant à favoriser la pratique d'activités physiques des élèves en milieu scolaire. Soixante-six intervenants scolaires ont réalisé une entrevue individuelle semi-dirigée. Puis, 23 de ces 66 participants ont pris part à des groupes de discussion visant à obtenir un consensus entre les participants quant à la priorisation des besoins de leur milieu. Les données recueillies ont été classées en fonction des cinq niveaux du modèle socio-écologique. Les résultats indiquent que la majorité des facteurs facilitants, des obstacles, des besoins et des priorités identifiés se référaient au niveau institutionnel. De plus, les résultats de cette étude montrent que les besoins prioritaires sont spécifiques à chaque milieu scolaire. Cette étude a permis la catégorisation des facteurs facilitants, des barrières, des besoins et des priorités, ce qui devient une ressource essentielle dans l'élaboration d'interventions visant à favoriser la pratique d'activités physiques des élèves en contexte scolaire.

Mots clés : contexte scolaire; mode de vie physiquement actif; modèle socio-écologique; facteurs facilitants; obstacles.

Introduction

The importance of physical activity for achieving and maintaining overall health and wellbeing is well established (Janssen & LeBlanc, 2010; Strong et al., 2005). Nevertheless, worldwide, more than 80% of adolescents do not meet the recommendations for at least 60 minutes of moderate to vigorous physical activity per day (World Health Organization, 2010, 2019). Indeed, adolescence is a pivotal period marked by a high dropout rate from physical activity (Dumith, Gigante, Domingues, & Kohl III, 2011). In Canada, data from the most recent cycle of the Canadian Health Measures Survey indicate that only 33% of youth aged 6 to 17 achieve a weekly average of at least 60 minutes of moderate to vigorous physical activity per day (Colley et al., 2017). Thus, the adoption of a physically active lifestyle by youth has become a priority in Canada (Government of Canada, 2012; Weatherson, Gainforth, & Jung, 2017). To rectify this situation, government, community, and private initiatives to promote physical activity among youth have increased in recent years in various provinces across Canada.

The School Context

The school context is at the heart of government initiatives targeting young people. Indeed, there is a great concern about the level of physical activity among young people given its known benefits on many aspects of their development, including physical and mental health as well as academic performance (Bangsbo et al., 2016; Janssen & LeBlanc, 2010; Strong et al., 2005;). That is, improving the academic performance of high school students is a fundamental objective for any high school. Therefore, the practice of physical activity on a regular basis could help schools to further achieve their mission. Moreover, since schools have access to youths and often have the facilities, equipment and staff to offer physical education and physical activity programs, they are often identified as an ideal place to propose a variety of interventions aimed at promoting regular physical activity among youth (Centers for Disease Control and Prevention, 2017; Kohl III & Cook, 2013; McMullen, Ni Chroinin, Tammelin, Pogorzelska, & Van Der Mars, 2015;). In order to be effective, these interventions must be part of a holistic and collaborative vision based on an approach targeting a variety of determinants (Centers for Disease Control and Prevention, 2017; Naylor et al., 2015). For example, different approaches aiming at improving youth's physical activity levels such as the Comprehensive School Health are based on collaboration between home, school and community partners (Centre for Health Promotion, 2006; International Union for Health Promotion and Education, 2009). Indeed, it is now well established that interventions that integrate the entire school environment and target both educational practices and the school environment have the highest success rates (Castelli et al., 2014; Naylor et al., 2015; Saunders et al., 2012).

According to Durlak and DuPre (2008), there is a significant gap between the development of school-based physical activity promotion interventions, such as curricular PA, non-curricula PA or active movement breaks, and the application of these interventions in the daily lives of adolescents. This gap is primarily due to the complexity of transposing interventions that have been developed in a controlled environment to a real school setting (Glasgow & Emmons, 2007). On this matter, there are few studies describing the implementation characteristics of this type of approach in schools (Siedentop, 2009) and

even fewer studies presenting evaluations of these implementation approaches and their impacts on the various youth health indicators (Naylor et al., 2015).

However, many school-related factors, such as various organizational constraints as well as the characteristics of the stakeholders and students, could be harmful to the promotion of regular physical activity (Cothran, Kulinna, & Garn, 2010; McMullen et al., 2015). For example, the inherent reality of high school contexts in the province of Quebec offers very little organizational flexibility, forcing the majority of interventions to be implemented outside the timetable. This reality specific to high schools brings its share of barriers and needs for school stakeholders such as teachers, principals, student life animators, social workers and pedagogical counsellors wishing to implement interventions aimed at encouraging the practice of physical activities by adolescents in the school environment (Deschesnes, Trudeau, & K  b  , 2009).

Facilitating Factors and Barriers

Several studies have examined the facilitating factors and barriers to implementing school-based physical activity interventions, however, the majority of these studies have been conducted in elementary schools (Naylor et al., 2015). With regard to studies carried out in high schools, one of the first things that can be observed is the variety of policies, programs, measures or interventions in which government and non-government agencies can promote physical activity among young people, which greatly influences the facilitating factors and barriers reported in the studies (Dobbins, Husson, DeCorby, & LaRocca, 2013; Hynynen et al., 2016). Despite this, there are a number of frequently cited barriers and facilitating factors to promote physical activity in schools (Hills, Dengel, & Lubans, 2015). These are often categorized as institutional and relate to school policies, school organization, facilities, equipment, and administrative support, teacher-related and arising from teacher beliefs and skills, or student-related. However, as several authors point out, it is difficult to compare and generalize international physical activity interventions because each program is contextualized according to the country, city and school where it is implemented (McMullen et al., 2015). Therefore, factors that may explain interventions' success or failure in one region may be different in another.

Developing a better understanding of the barriers and facilitating factors to the implementation of physical activity measures in high schools would provide a frame of reference from which these schools could adjust, create, consolidate and adopt various interventions aimed at developing an active lifestyle in the school context. Furthermore, to our knowledge, no study on the barriers and factors facilitating the implementation of interventions aimed at promoting the practice of physical activities in high schools in the province of Quebec exists in the current literature. Thus, the objective of this study was to identify the facilitating factors, barriers, needs and priorities of high school stakeholders in relation to the implementation of present interventions for the purpose of encouraging the practice of physical activities by students in the school context.

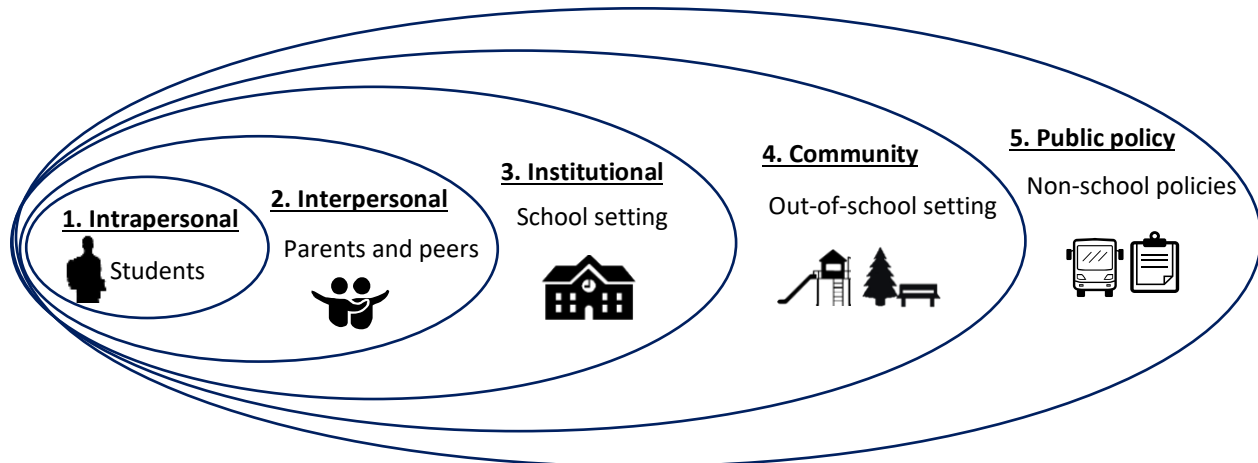
Theoretical Framework

The adoption of an active lifestyle can be explained by the presence of multiple factors influencing the practice of physical activity, by the interaction between these factors and by their presence within several levels (Sallis et al., 2008). That is, in order to

encourage the regular physical activity by young people, the current global trend is to promote a socio-ecological approach in the school context (McMullen et al., 2015).

In this study, the adapted socio-ecological model of McLeroy et al. (1988) was used to analyze and categorize the needs and priorities of school stakeholders. This model, illustrated in Figure 1., involves five levels of factors: (1) intrapersonal; (2) interpersonal; (3) institutional; (4) community; and (5) public policy. All levels are interdependent and influence each other.

Figure 1. Socio-Ecological Model Adapted from McLeroy et al. (1988)



The intrapersonal level is the basis of the socio-ecological model. The elements included in this level relate to the characteristics of the student, i.e., his or her beliefs, abilities, socio-economic level, attitudes, among others. The second level of the model is the interpersonal level. Elements relating to the student's social relationships with his or her family and with other students have been classified at this level. The third level, the institutional level, includes all the factors belonging to the school setting, namely physical, social and organizational. This level is divided into four categories: (a) school organization; (b) stakeholders; (c) intervention; and (d) implementation. The school organization category refers to the school's administrative sphere, i.e., the school's internal policies, programs, infrastructures, and so on. The category of stakeholders refers to the characteristics of the individuals working with students, mainly teachers. The intervention category refers to what is done with the student. As for the implementation category, it includes elements related to the implementation process of various programs, i.e., physical activity, continuing education, and support programs. The next level is the community level and includes elements relating to municipalities, businesses, the population, and the environment outside the school. Finally, the level furthest from the student is the policy level. This level includes policies external to the school, such as those adopted by the government and school boards regarding funding, transportation, and the time prescribed for each subject, among others.

Methods

Overview

This qualitative research is descriptive in nature. Sixteen high schools belonging to 15 school boards from 10 different administrative regions of the province of Quebec in Canada were purposely sampled. This selection allowed researchers to contact stakeholders working in various school contexts and, in turn, ensured better representativity. For example, the decile rank of the socio-economic background index of these institutions ranged from 1 to 9, with rank 1 being considered the least disadvantaged and rank 10 the most disadvantaged. Some of these schools have fewer than 500 pupils ($n = 4$), between 500 and 1,000 pupils ($n = 2$), between 1,000 and 1,500 pupils ($n = 8$), while others have more than 1,500 pupils ($n = 2$). This information is detailed in Table 1 for each of the schools. Finally, the schools included two English-language and 14 French-language. It should be noted that, in Quebec, high school includes grades 7 to 11 (12 to 17 years old).

Table 1. Profile of Participating High Schools

School	Decile Rank of Socio-Economic Background Index	Number of Students Enrolled
1	6	1,000 – 1,500
2	3	< 500
3	8	< 500
4	6	500 – 1,000
5	1	1,000 – 1,500
6	4	1,000 – 1,500
7	1	1,000 – 1,500
8	7	1,000 – 1,500
9	3	1,000 – 1,500
10	5	1,000 – 1,500
11	1	1,000 – 1,500
12	8	< 500
13	9	< 500
14	8	> 1,500
15	9	> 1,500
16	6	500 – 1,000
Mean	5.31	1,011
	Total	16,181

Participants and Data Collection

Data collection was conducted in two stages: (a) semi-structured interviews, and (b) focus groups.

Semi-structured interviews. A total of 66 school stakeholders (Female: $n = 28$) were recruited through email announcements and volunteered to participate in a semi-structured individual interview (Savoie-Zajc, 2009). The interview intended to first identify the participants' perceived facilitating factors, barriers and needs in relation to the implementation of interventions aimed at encouraging the practice of physical activity by

students in the school context. The only inclusion criterion was to be involved in any way in the physical activities offered at one of the selected schools. As intended, the role of these stakeholders within their school varied. The following stakeholders were interviewed: (a) school principals (n = 10); (b) physical and health education teachers (n = 20); (c) teachers of other subjects (n = 11); (d) complementary educational services professionals (n = 12), such as student life animators and social workers; (e) physical and health education pedagogical counsellors (n = 5); (f) parents (n = 7); and (g) other stakeholders involved in implementing measures to encourage students to be physically active (n = 1).

During the interview, which lasted on average 18.5 minutes, participants were asked the following four questions:

1. Considering the characteristics of your school environment, what factors facilitate the implementation of measures to promote student physical activity? Explain your answer.
2. Considering the characteristics of your school environment, what factors hinder the implementation of measures to promote student physical activity? Explain your answer.
3. Considering the characteristics of your school environment, what would make it easier to implement measures to promote student physical activity? Explain your answer.
4. What is the most important thing that has been discussed so far that would make it easier to implement measures to promote student physical activity? Explain your answer.

Telephone interviews were used to gain access to participants from different regions. All interviews were digitally recorded and transcribed verbatim. All the transcripts were reviewed for accuracy.

Focus groups. Twenty-three of these 66 participants agreed to participate in a focus group designed to discuss about different initiatives implemented in their community to favor students practice of physical activity, to deepen their responses regarding their needs and to prioritize these needs. Indeed, focus group interviews allowed more than one participant from the same subgroup to express their point of view, to highlight nuances in the identification and prioritization of needs and to justify their prioritization (Baribeau, 2009). In total, one focus group with between five and seven participants took place in each of the four different schools. Table 2 provides details about the participants in each of the four focus groups and their schools.

Table 2. Profile of Focus Groups Participants

Schools	Number of Participants	Participants' Job Titles	Decile Rank of Socio-Economic Background Index	Number of Students Enrolled
1	5	Physical Education teachers (n = 3) Student life animator (n = 1) Parents on the school board (n = 1)	6	> 1,000
2	6	Principal (n = 1) Vice-principal (n = 1) Pedagogical counsellors (n = 1) Physical Education teachers (n = 1) Teacher (n = 1) Other stakeholder (n = 1)	3	< 500
3	7	Principal (n = 1) Vice-principal (n = 1) Physical Education teachers (n = 1) Teachers (n = 4)	8	< 500
4	5	Physical Education teachers (n = 1) Teachers (n = 2) Student life animator (n = 1) Social worker technician (n = 1)	1	> 1,000
Mean			4.5	884
Total				3,536

Four focus groups (Geoffrion, 2009) lasting on average 76 minutes were conducted at the participants' high schools. Focus groups were divided into two phases, whereas Phase One focussed on the formulation of recommendations regarding the implementation of physical activity interventions based on experienced initiatives, Phase Two was oriented on deepening the participants reflection on their needs. The focus groups were transcribed verbatim for further analysis.

Before a focus group was conducted, the needs with the most occurrences were identified through individual interviews conducted with all the participants in this one particular setting. These main needs served as a starting point for the discussion during the second phase of the focus groups. Participants were asked to share and argue their thoughts, until consensus was reached on the prioritization of their school environment's needs.

It should be noted that all study participants provided free and informed consent in writing. This study was approved by the Research Ethics Board - Education and Social Sciences of the Université de Sherbrooke (no. 2018-1670).

Data Analysis

Data from semi-structured interviews and focus groups were subjected to content analysis using inductive and deductive approaches (L'Écuyer, 1990). Meaning units were coded and regrouped using the NVivo 12 for Windows (QSR International, Victoria, Australia). Meaning units extracted from our data were then distributed in the five levels of the socio-ecological model (adapted from McLeroy et al., 1988; see Figure 1) in categories of facilitating factors, barriers, needs and priorities. These categories were created based on literature and on the participants' answers if needed. Meaning units were sorted by occurrence in order to highlight their relative importance. The use of this model makes it possible to group the factors affecting students' regular physical activity according to their level of influence and to consider the interrelationships between each level. The results obtained for each element on which participants were questioned, i.e., facilitating factors, barriers, needs and priorities, will therefore be presented based on this model.

An inter-judge validation was conducted with the help of another member of the research team to ensure the reliability of these analyses. That is, an interview was randomly selected and analyzed individually by the two researchers. The agreement rate obtained was 98%, which is above the 80% acceptable threshold (L'Écuyer, 1990). Moreover, the dual data collection strategy consisting of interviews and focus groups enabled triangulation, which allows to test validity of the data gathered through the convergence. It also allows participants in the focus groups to clarify or to specify statements made in the interviews.

Results

Interviews

The presentation of the results of the interviews is divided into four sections, i.e., the four themes on which the participants were interviewed: (a) facilitating factors; (b) barriers; (c) needs; and (d) priorities for the implementation of structural measures to promote the practice of physical activities by students. In each section, the highlights of the element presented is stated followed by discussion of elements with the most occurrences.

Facilitating factors. Data gathered from the individual interviews provided 295 meaning units about facilitating factors. Most of the facilitating factors identified by school stakeholders are found in the institutional level ($n = 269$) of the socio-ecological model, while few meaning units refer to the intrapersonal ($n = 4$), interpersonal ($n = 5$), community ($n = 11$) and public policy ($n = 6$) levels. Five main themes emerged from the interviews: (a) the presence at school of physical activity programs ($n = 101$); (b) sufficient, quality, and accessible sports infrastructures ($n = 46$); (c) a high level of involvement in school initiatives by school stakeholders ($n = 34$); (d) sufficient, accessible, and specialized quality sports equipment ($n = 24$); and (e) significant leadership from the principal ($n = 17$). It should be noted that these five factors that facilitate the implementation of measures to promote student physical activity refer to only one level of the socio-ecological model, i.e., the institutional level.

Thus, according to the stakeholders interviewed, the presence of physical activity programs in the school (n = 101) provides more opportunities for students to be active. These programs include: a) extracurricular sports (n = 27), i.e., competitive or recreational before- or after-school sports; b) lunchtime sports (n = 20), i.e., free or organized lunchtime activities; c) school-specific programs (n = 14), i.e., sports concentrations, multi-sport programs or electives; d) sport-study programs (n = 12), among others. With respect to infrastructures (n = 46), the main issues were: a) quantity (n = 29); b) quality (n = 10); and c) accessibility (n = 7). Indeed, it was reported that a variety of indoor and outdoor infrastructures such as gymnasiums, weight rooms, boxing halls and swimming pools, which are available and adequate, offer more opportunities for the practice of physical activities. Moreover, when stakeholders are very involved in the initiatives (n = 34), they act as role models for the students and are inspiring to them. They are motivated, set up new initiatives to offer physical activities to students, and contribute to the maintenance of existing initiatives.

We have a physical education teacher [in our school-team] who is always enthusiastic. He proposes less known and new activities to students. This inspires students and increases their level of motivation. [Physical education teacher]

Equipment (n = 24) was subsequently identified as a facilitating factor when it is adequate and in sufficient quantity. The presence of specialized equipment (n = 10) such as stationary bikes and training equipment, as well as the presence of other equipment in sufficient quantity (n = 10), among other things, increases students' interest in physical activity. Finally, it appears to be easier to implement initiatives that promote student physical activity when the principal demonstrates significant leadership (n = 17). Indeed, it is easier to have a principal who has a positive attitude towards physical education and physical activity, who is open to proposals, who is accommodating, and who offers financial support for projects.

Barriers. Data gathered from the interviews provided 227 meaning units about barriers to the implementation of structural measures related to the practice of physical activity by students. Most of the barriers identified by school stakeholders were found at the institutional level (n = 159) of the socio-ecological model, while a few meaning units referred more to the intrapersonal (n = 27), interpersonal (n = 14), community (n = 8) and public policy (n = 19) levels. In sequence, the main barriers identified by participants are : (a) insufficient and obsolete sports infrastructures (n = 54; institutional level); (b) problems related to school transportation (n = 15; policy level); (c) lack of parental collaboration (n = 12; interpersonal level); (d) lack of knowledge and/or skills of stakeholders (n = 11; institutional level), tied with difficulties in organizing the school schedule (n = 11; institutional level); and (e) low interest shown by students (n = 10; intrapersonal level). It should be noted that the main barriers to the implementation of measures to promote student physical activity refer to four different categories of the socio-ecological model, namely: public policy; institutional; interpersonal; and intrapersonal.

Several infrastructure constraints (n = 54) reduce students' opportunities for physical activity in school settings, such as insufficient quantity (n = 32), poor quality (n = 14), and difficulties of access (n = 7). Second, problems related to school transportation (n = 15), such as the lack of additional school transportation (n = 10) earlier in the morning and after extracurricular physical activities at the end of the day hindered student participation.

Participants also felt that it is difficult to engage students in physical activities when parents are not very collaborative (n = 12), for example, when parents place little emphasis on healthy active living (n = 5). The lack of knowledge and/or skills of stakeholders (n = 11), more specifically a lack of diversity of means of action in physical education (n = 8), was also reported as a barrier to the implementation of interventions promoting student physical activity in the school setting.

Some PE teachers limit physical activity to classic competitive sports. What they offer students lacks variety. For example, you'll always find "basketball" during lunch time. It's popular among the guys on the basketball team, but it leaves a lot of other students with too few choices.
[School principal]

In addition, the organization of the school schedule is a constraining factor (n = 11), while some teachers are not willing to reduce their class time in favour of physical activity and sports (n = 4), among other things. Finally, students' interests (n = 10) are considered an obstacle when students are difficult to mobilize, their interests are not oriented towards physical activity and they refuse to participate in physical education classes.

Needs. Data gathered from the interviews provided 226 meaning units concerning participants' needs regarding the implementation of measures to promote physical activity. The vast majority of the needs stated by the participants were at the institutional level of the socio-ecological model (n = 155), while several other needs were at the intrapersonal (n = 9), interpersonal (n = 7), community (n = 12) and public policy (n = 43) levels. The main needs identified by participants are: (a) improve the quantity, quality and accessibility of sport infrastructures (n = 36; institutional level); (b) benefit from external policies that promote regular physical activity (n = 25; policy level); (c) benefit from a greater quantity of quality sports equipment (n = 24; institutional level); (d) grant time off work to school officials (n = 12; institutional level), ex aequo with improved partnerships with the community (n = 12; community level); and 5) facilitate school transportation (n = 10; policy level). It should be noted that the main needs for the implementation of measures to promote student physical activity refer to three different categories of the socio-ecological model, namely: public policy; community; and institutional.

Several participants (n = 36) identified the need to improve the quantity (n = 19), quality (n = 12) and accessibility (n = 5) of sports infrastructures. They maintain that adequate infrastructures would make it possible to diversify the activities offered and better meet the needs of the community. With respect to policies (n = 25), some participants raised the need for government policies to prescribe more time for physical education (n = 12) and physical activity (n = 12).

Actually, we are following the prescribed time for every school subject.
[For the physical education and health course], it is two periods of 75 minutes each per a 9-day schedule. This is not sufficient. [School principal]

Then, different needs related to equipment (n = 24), including quantity (n = 13) and quality (n = 9) were identified. For example, some participants would like to diversify their equipment in order to vary the activities offered to students, while others would like to obtain equipment that can be integrated into classrooms. Second, participants need to be released of work (n = 12) so that school staff can plan and organize activities that encourage students to be physically active. Several needs related to partnerships with the community

(n = 12) were also identified, including the enhancement of collaborations and agreements with cities (n = 7). Finally, improving school transportation was identified as a need by 10 participants (n = 10). It was stated that better school transportation adapted to the reality of schools would facilitate the transportation of students participating in sports activities and thus increase participation in these activities.

Priorities. To conclude the individual interview, the participant was asked to identify, among all the elements he or she had named during the interview, the most important element to facilitate the implementation of measures to promote the practice of physical activity by students. Some participants identified more than one priority, that's why 100 priority items were extracted from the 66 interviews. The majority of these priorities are found at the institutional level (n = 60) of the socio-ecological model, while the others refer to the intrapersonal (n = 8), interpersonal (n = 4), community (n = 1) and public policy (n = 27) levels. The top priorities identified by participants are : (a) benefit from external policies that promote regular physical activity (n = 14; policy level); (b) improve the quantity and quality of sports facilities (n = 12; institutional level); (c) benefit from significant leadership from the principal and school team (n = 10; institutional level); and (d) raise students' interest in regular physical activity (n = 5; intrapersonal level), tied with facilitating school transportation (n = 5; policy level). It should be noted that the main priorities here refer to three different categories of the socio-ecological model: public policy; institutional; and intrapersonal.


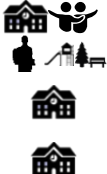


Several stakeholders (n = 14) believe it is a priority for government to adopt policies to prescribe more time for physical activity (n = 8) and physical education (n = 6). There also appears to be a need to improve the quantity (n = 9) and quality (n = 3) of sports infrastructures. Improving leadership was identified as a priority by several participants (n = 10). It seems essential for the school principal (n = 5) to give priority to the practice of physical activities and for the school-team (n = 5) to be open to change and to be involved in the implementation of measures that promote the practice of physical activities by students. Finally, some felt that it is necessary to find a way to increase student motivation and interest in physical activity (n = 5), while improving school transportation (n = 5) was identified as the most important element by five participants. It should be noted that these five participants come from the same school and that, in this environment, transportation issues are a priority since most students live at a considerable distance from school.

Focus Groups

Phase One: Recommendations based on experienced initiatives. The analysis of the data sets out the need for school communities to benefit from clear policy orientations aimed at promoting the regular practice of physical activities in the school setting, particularly on the part of school boards and the ministry. Participants pointed out that clear policy directions are often accompanied by the funding needed to implement measures in the school environment. However, although the educational community would like to have clear directions for regular physical activity in the school setting (the what), they recommended that each school-team be given the choice of strategies (the how) to implement in their community, depending on: (a) the interests of current stakeholders; (b) available programs; (c) infrastructures; and (d) the characteristics of the school environment.

Phase Two: Prioritizing the needs of each school environment. The previous analysis of the interviews led to the identification of seven to ten needs per school to be prioritized by the participants in phase two of the focus group. Table 3 presents the three main needs identified for each school during phase two of the focus groups. These needs refer to the intrapersonal (n = 1), interpersonal (n = 1), institutional (n = 9), community (n = 2) and public policy (n = 2) levels.

Table 3. Prioritized Needs of the Different Schools

Schools	Prioritized Needs	
1		<ol style="list-style-type: none"> 1. Diversify the physical and sports activities offered as extracurricular activities; 2. Make the subject-timetable and academic pathways more flexible; 3. Increase the hours of physical and health education for all.
2		<ol style="list-style-type: none"> 1. Raise awareness of the impact of physical activity on academic performance; 2. Increase the time allocated to physical and health education in the subject-timetable; 3. Recognize the involvement of teachers.
3		<ol style="list-style-type: none"> 1. Facilitate school transportation; 2. Ensure the succession of stakeholders from the community; 3. Improve infrastructures.
4		<ol style="list-style-type: none"> 1. Add political will and ensure that the school-team prioritizes regular physical activity; 2. Add periods of physical and sports activities to the subject-timetable; 3. Improve infrastructures.

The analysis of the arguments used by the participants to justify the prioritization of needs can be regrouped in three main themes. First, in all the focus groups, the number of people who would potentially be affected by the measure is the main argument used to prioritize needs.

Here, [facilitating active transportation], we reach 80 students. There, [increasing the time allocated to physical and health education in the subject-timetable], we reach 450 students. [Social science teacher]

Second, the need to increase the hours allocated to teaching physical and health education is justified by the educational aspect inherent to the discipline and the lasting effect of this measure. It was pointed out on a number of occasions that it is not just "play sports only to play sports" that should be addressed here, but rather educating young people to adopt healthy lifestyles and give them a taste for physical activity in the long run. Finally, a community vision is sometimes put at the forefront in the prioritization of needs. For example, one participant mentioned that improving the infrastructures at his school could benefit not only the school clientele, but also parents and community members, who would have access to more facilities for physical activity.

Discussion

The objective of this study was to identify the facilitating factors, barriers, needs and priorities of high school stakeholders in relation to the implementation of interventions aimed at encouraging the practice of physical activity by students in the school context. The results obtained from semi-structured individual interviews and focus groups made it possible to achieve this objective.

Many facilitating factors, barriers, needs, and priorities were identified with respect to the implementation of interventions to promote student physical activity in schools. Most of the elements identified by the participants are mainly found in the institutional setting of the socio-ecological model, which also corresponds to the results obtained in previous studies (Hills et al., 2015; Morgan & Bourke, 2008). More specifically, within this level, the categories related to school organization is by far the category with the greatest number of elements identified by participants. Among other things, it was suggested that adequate infrastructures, in terms of quantity, variety, quality and accessibility, would make it possible to diversify the activities offered and better meet the needs of the community. These results reflect the observations reported by many authors to the effect that the lack of infrastructures and equipment as well as their accessibility are obstacles frequently mentioned by all school stakeholders (Allison et al., 2014; Barroso, McCullum-Gomez, Hoelscher, Kelder, & Murray, 2005; Brown & Elliott, 2015; Jenkinson & Benson, 2010). Indeed, for teachers, accessible facilities in the school and in the community give students better chances of being active (Boyle, Jones, & Walters, 2008). In addition, the presence of outdoor and indoor facilities makes it possible to adapt to weather that may be less favourable and to offer a greater variety of activities (Al-Za'abi, Kilani, Mo'ath, & Alnuaimi, 2018; Beighle & Morrow Jr., 2014).

Next, the needs prioritization exercise conducted during the focus groups revealed that increasing the time allocated to physical and health education and physical and sports activities in the school schedule is the main priority common to each setting. This need was prioritized by three of the four schools that participated in the focus groups. It should be noted that the school which did not prioritize this need, already has more physical and health education periods than the recommended minimum and also includes recurrent periods in the school schedule where students can engage in physical activities. This prioritization is in line with findings from previous studies that found that the vast majority of teachers believe more time should be devoted to physical education and physical activity in the curriculum (Boyle et al., 2008; Evenson, Ballard, Lee, & Ammerman, 2009; Patton, 2012). Indeed, it has already been reported that teachers appreciate the increased attention in class generated by physical activity (Cothran et al., 2010), but on the other hand, they find themselves forced to reduce the time they would like to devote to promoting physical activity in the classroom in order to focus on other subjects (Allison et al., 2016; Barroso et al., 2005; Boyle et al., 2008). Consequently, the place of physical education and physical activity in the school curriculum is influenced by the priority that the school places on it. In addition, teaching physical education appears to be the most accessible way to promote regular physical activity (Payne & Morrow, 2009). In this context, it is surprising to note that the amount of time allocated to this school subject is declining worldwide (McLennan & Thompson, 2015). In an effort to reverse this trend, the United Nations Educational, Scientific and Cultural Organization (UNESCO) has published guidelines for governments

to take political actions to promote the creation of environments conducive to physical activity and to offer high quality training programs (McLennan & Thompson, 2015). Subsequently, the diversity of needs identified and the different prioritization carried out in each focus group shows that the needs prioritized are specific to each school setting must be seriously considered when creating initiatives to facilitate the implementation of measures to promote physical activity in a school context. This is consistent with the results obtained by other groups of researchers, who indicate that the adaptability and flexibility of the measures implemented are key success factors (Goh, Hannon, Webster, & Podlog, 2017; Lau, Wandersman, & Pate, 2016). Ultimately, these participants' prioritization must necessarily guide the actions that will be proposed subsequently in order to efficiently meet the needs they expressed. In this way, the structuring measures will be better adapted to the real needs of stakeholders working in high schools in the province of Quebec.

The results obtained in this study are partly in line with the current global trend that promotes a socio-ecological approach to encourage the adoption of regular physical activity by young people in the school context. The results confirm the presence of multiple factors influencing the adoption of a physically active lifestyle, the interaction between these factors, as well as the presence of these factors at several levels. Furthermore, the use of both inductive and deductive approaches during content analysis allowed us to enhance the socio-ecological model. Indeed, factors as well as categories of factors were defined and distributed within the five levels of the model, which is an interesting contribution to the literature. In addition, this study also showed that factors specific to the following three levels are rarely identified by school stakeholders: the community; parents and peers; and students. These results are comparable with the results of previous studies (Brown & Elliott, 2015; Jenkinson & Benson, 2010). More specifically, it is surprising to notice that the students are seldom mentioned in the comments collected from participants, whereas all the interventions conducted in the school context are intended to influence the students' behaviour. While the focus of the stakeholders interviewed was more on factors specific to the school environment, it would certainly be relevant to question students directly in order to enrich the current understanding of the issues related to interventions aimed at adopting or maintaining their own regular physical activity. In this regard, it has been reported that there is a significant gap between what is offered to young people and their needs (James et al., 2018), which adds to the relevance of giving them a voice to better target these needs.

This study has certain limitations. First, given the existing differences between school systems around the world, its results cannot be generalized beyond the Quebec school system. Second, the voluntary nature of participation may have led to participation bias. Moreover, because of the aim of this study, all participants were school stakeholders. This could have led to a bias in the answers in favor of the institutional level. Finally, because of the methodology used, another limitation in this study is that the analyses are based on participants' self-reported perceptions, which are subjective. Despite these limitations, this study, using a mixed method, has provided a portrait that can help to better define the facilitating factors, barriers, needs and priorities of high school stakeholders in implementing measures to promote the practice of physical activity by students, both nationally and internationally.

Conclusion

This study helped to better identify the facilitating factors, barriers, needs and priorities faced by school stakeholders with respect to the implementation of measures to promote physical activity among high school students. In this study, most of the elements identified by the participants are at the level of the institutional environment of the socio-ecological model and concern school organization. In addition, our results show that the needs reported are specific to each school context. While it appears difficult to generalize the initiatives implemented in the various settings, the categorization of facilitating factors, barriers, needs and priorities becomes an essential resource in the development of interventions aimed at encouraging the practice of physical activities by students in the school context. These findings must be seriously considered and must be used to guide the initiatives taken in this regard. Finally, very few of the elements identified by school stakeholders refer to the students, they who are at the centre of the model and directly targeted by the interventions. Further research should include the perspective of students in relation to interventions aimed at adopting or maintaining their own regular physical activity in order to enrich the current understanding of related issues.

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References

- Al-Za'abi, A.S., Kilani, H.A., Mo'ath, F., & Alnuaimi, J. (2018). Perceived health benefits and barriers to physical activity among secondary school students. *International Scientific Journal of Kinesiology*, 11(1), 92-103.
- Allison, K.R., Schoueri-Mychasiw, N., Robertson, J., Hobin, E., Dwyer, J.J., & Manson, H. (2014). Development and implementation of the Daily Physical Activity policy in Ontario, Canada: A retrospective analysis. *Revue phénEPS/PHEnex Journal*, 6(3), 1-7.
- Allison, K.R., Vu-Nguyen, K., Ng, B., Schoueri-Mychasiw, N., Dwyer, J.J., Manson, H., ... Robertson, J. (2016). Evaluation of Daily Physical Activity (DPA) policy implementation in Ontario: Surveys of elementary school administrators and teachers. *BMC Public Health* 16(1), 746.
- Bangsbo J., Krstrup P., Duda J., Hillman, C.H., Andersen, L.B., Weiss, M., Elbe, A.M. (2016) The Copenhagen Consensus Conference 2016: Children, youth, and physical activity in schools and during leisure time. *British Journal of Sports Medicine*. 50(19), 1177-1178.
- Baribeau C. (2009). Analyse des données des entretiens de groupe. *Recherches qualitatives*, 28(1), 133-148.
- Barroso, C.S., McCullum-Gomez, C., Hoelscher, D.M., Kelder, S.H., & Murray, N.G. (2005). Self-reported barriers to quality physical education by physical education specialists in Texas. *Journal of School Health*, 75(8), 313-319.
- Beighle, A., & Morrow Jr., J.R. (2014). Promoting physical activity: addressing barriers and moving forward. *Journal of Physical Education, Recreation and Dance*, 85(7), 23-26.
- Boyle, S.E., Jones, G.L. & Walters, S.J. (2008). Physical activity among adolescents and barriers to delivering physical education in Cornwall and Lancashire, UK: A qualitative study of heads of PE and heads of schools. *BMC Public Health*, 8(1), 273.
- Brown, K.M., & Elliott, S.J. (2015). It's not as easy as just saying 20 minutes a day': Exploring teacher and principal experiences implementing a provincial physical activity policy. *Universal Journal of Public Health*, 3(2), 71-83.
- Castelli, D. M., Centeio, E. E., Beighle, A. E., Carson, R. L., & Nicksic, H. M. (2014). Physical literacy and comprehensive school physical activity programs. *Preventive Medicine*, 66, 95-100.
- Centers for Disease Control and Prevention. (2017). *Increasing physical education and physical activity: A framework for schools*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services.
- Centre for Health Promotion. (2006). *Health promotion: better health, better learning guidelines for health promotion with schools and preschools* [Resource Guidelines]. Australia: Government of South Australia.
- Colley, R.C., Carson, V., Garriguet, D., Janssen, I., Roberts, K.C., & Tremblay, M.S. (2017). Physical activity of Canadian children and youth, 2007 to 2015. *Health Reports*, 28(10), 8-16.
- Cothran, D.J., Kulinna, P.H., & Garn, A.C. (2010). Classroom teachers and physical activity integration. *Teaching and Teacher Education*, 26(7), 1381-1388.

- Deschesnes, M., Trudeau, F., & K  b  , M. (2009). Factors influencing the adoption of a health promoting school approach in the province of Quebec, Canada. *Health Education Research*, 25(3), 438-450.
- Dobbins, M., Husson, H., DeCorby, K., & LaRocca, R.L. (2013). School-based physical activity programs for promoting physical activity and fitness in children and adolescents aged 6 to 18. *Cochrane Database of Systematic Reviews*, (2), CD007651.
- Dumith, S.C., Gigante, D.P., Domingues, M.R., & Kohl III, H.W. (2011). Physical activity change during adolescence: A systematic review and a pooled analysis. *International Journal of Epidemiology*, 40(3), 685-698.
- Durlak, J.A., & DuPre, E.P. (2008). Implementation matters: A review of research on the influence of implementation on program outcomes and the factors affecting implementation. *American Journal of Community Psychology*, 41(3-4), 327-350.
- Evenson, K.R., Ballard, K., Lee, G., & Ammerman, A. (2009). Implementation of a school-based state policy to increase physical activity. *Journal of School Health*, 79(5), 231-238.
- Geoffrion, P. (2009). Le groupe de discussion. In B., Gauthier (Ed.), *Recherche sociale. De la probl  matique    la collecte de donn  es* (5th ed., pp. 391-414). Qu  bec, Canada: Presses de l'Universit   du Qu  bec.
- Glasgow, R.E., & Emmons, K.M. (2007). How can we increase translation of research into practice? Types of evidence needed. *Annual Review of Public Health*, 28(1), 413-433.
- Goh, T.L., Hannon, J.C., Webster, C.A., & Podlog, L. (2017). Classroom teachers' experiences implementing a movement integration program: Barriers, facilitators, and continuance. *Teaching and Teacher Education*, 66, 88-95.
- Government of Canada. (2012). *Canadian Sport Policy 2012*. Retrieved from https://sirc.ca/app/uploads/files/content/docs/Document/csp2012_en.pdf
- Hills, A.P., Dengel, D.R., & Lubans, D.R. (2015). Supporting public health priorities: Recommendations for physical education and physical activity promotion in schools. *Progress in Cardiovascular Diseases*, 57(4), 368-374.
- Hynynen, S.T., van Stralen, M.M., Sniehotta, F.F., Ara  jo-Soares, V., Hardeman, M.J., Chinapaw, M., ... Hankonen, N. (2016). A systematic review of school-based interventions targeting physical activity and sedentary behaviour among older adolescents. *International Review of Sport and Exercise Psychology*, 9(1), 22-44.
- International Union for Health Promotion and Education. (2009). *Achieving health promoting schools: guidelines for promoting health in schools*. Saint-Denis Cedex, France: International Union for Health Promotion and Education.
- James, M., Todd, C., Scott, S., Stratton, G., McCoubrey, S., Christian, D., ... Anderson, S. (2018). Teenage recommendations to improve physical activity for their age group: A qualitative study. *BMC Public Health*, 18(1), 372.
- Janssen, I., & LeBlanc, A.G. (2010). Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *International Journal of Behavioral Nutrition and Physical Activity*, 7(1), 40.
- Jenkinson, K.A., & Benson, A.C. (2010). Barriers to providing physical education and physical activity in Victorian state secondary schools. *Australian Journal of Teacher Education*, 35(8), 1.

- Kohl III, H.W., & Cook, H.D. (2013). *Educating the student body: Taking physical activity and physical education to school*. Washington, DC: National Academies Press.
- L'Écuyer, R. (1990). *Méthodologie de l'analyse développementale de contenu : Méthode GPS et concept de soi*. Québec, Canada: Presses de l'Université du Québec.
- Lau, E.Y., Wandersman, A.H., & Pate, R.R. (2016). Factors influencing implementation of youth physical activity interventions: An expert perspective. *Translational Journal of the American College of Sports Medicine*, 1(7), 60-70.
- McLennan, N., & Thompson, J. (2015). *Quality Physical Education (QPE): Guidelines for policy makers*. Paris, France: UNESCO Publishing.
- McLeroy, K.R., Bibeau, D., Steckler, A., & Glanz, K. (1988). An ecological perspective on health promotion programs. *Health Education Quarterly*, 15(4), 351-77.
- McMullen, J., Ni Chroinin, D., Tammelin, T., Pogorzelska, M., & Van Der Mars, H. (2015). International approaches to whole-of-school physical activity promotion. *Quest*, 67(4), 384-399.
- Morgan, P., & Bourke, S. (2008). Non-specialist teachers' confidence to teach PE: The nature and influence of personal school experiences in PE. *Physical Education and Sport Pedagogy*, 13(1), 1-29.
- Naylor, P.J., Nettlefold, L., Race, D., Hoy, C., Ashe, M.C., Higgins, J.W., & McKay, H.A. (2015). Implementation of school based physical activity interventions: A systematic review. *Preventive Medicine*, 72, 95-115.
- Patton, I.T. (2012). School-based physical activity in children: An evaluation of the Daily Physical Activity program in Ontario elementary schools. PhD diss., University of Western Ontario.
- Payne, V.G., & Morrow Jr., J.R. (2009). School physical education as a viable change agent to increase youth physical activity. *The President's Council on Physical Fitness and Sports Research Digest*, 10(2), 1-8.
- Sallis, J.F., Owen, N., & Fisher, E.B. (2008). Ecological models of health behavior. In: *Health behavior and health education: Theory, research, and practice* (4th ed., pp. 465-485). San Francisco, CA, US: Jossey-Bass.
- Saunders, R.P., Pate, R.R., Dowda, M., Ward, D.S., Epping, J.N., & Dishman, R.K. (2012). Assessing sustainability of Lifestyle Education for Activity Program (LEAP). *Health Education Research*, 27(2), 319-330.
- Savoie-Zajc, L. (2009). L'entrevue semi-dirigée. In B. Gauthier (Ed.), *Recherche sociale. De la problématique à la collecte de données* (5th ed., pp. 337-360). Québec, Canada: Presses de l'Université du Québec.
- Siedentop, D.L. (2009). National plan for physical activity: Education sector. *Journal of Physical Activity and Health*, 6(s2), S168-S180.
- Strong, W.B., Malina, R.M., Blimkie, C.J.R., Daniels, S.R., Dishman, R.K., Gutin, B., ... Trudeau, F. (2005). Evidence based physical activity for school-age youth. *The Journal of Pediatrics*, 146(6), 732-737.
- Weatherson, K.A., Gainforth, H.L., & Jung, M.E. (2017). A theoretical analysis of the barriers and facilitators to the implementation of school-based physical activity policies in Canada: A mixed methods scoping review. *Implementation Science*, 12(1), 41.
- World Health Organization. (2010). *Global recommendations on physical activity for health*. Geneva, Switzerland: WHO Press.

World Health Organization. (2019). *To grow up healthy, children need to sit less and play more*. Geneva, Switzerland: WHO Press.