

PHYSICAL ACTIVITY AND HEALTH ASPECTS OF COVID-19 PANDEMIC

EDITORS:

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EXPLORING SOCIAL AND SCHOOL SUPPORT FOR PHYSICAL ACTIVITY DURING COVID-19 PANDEMIC LOCKDOWN IN YOUTH

**Marie-Maude Dubuc^{1,2}, Maurine Remacle³, Marylène Goudreault⁴,
Félix Berrigan^{2,5}, Sylvie Beaudoin^{2,5}, Sylvain Turcotte^{2,5} and
Alexandre Mouton³**

¹Department of Exercise Science, Université du Québec à Montréal, Montréal,
Quebec, Canada

²Kino-Québec Research Chair on the Adoption of a Physically Active Lifestyle in
School Contexts, Université de Sherbrooke, Sherbrooke, Quebec, Canada

³Sport Sciences Department, URIS - Unité de Recherche Interfacultaire Santé &
Société, University of Liège, Liège, Belgium

⁴Direction régionale de santé publique du CIUSSS du Centre-Sud-de-l'île-de-
Montréal, Montréal, Canada

⁵Faculty of Exercise Science, Université de Sherbrooke, Sherbrooke, Quebec, Canada

Corresponding author:

Marie-Maude Dubuc

e-mail: dubuc.marie-maude@uqam.ca

ABSTRACT

OBJECTIVES: This study aimed to explore social and school support for physical activity during COVID-19 pandemic lockdown in adolescents, to investigate how those young people interacted with their school environment during the spring 2020 lockdown, and to examine how this could have impacted their practice of physical activity. This study also meant to provide an international perspective to these outcomes. **METHODS:** Between December 2020 and March 2021, 2,948 Canadian and 1,356 Belgian high school students completed an online questionnaire assessing their perceived change in physical activity, their interaction with schools regarding physical activity, and the physical activity-related resources offered to them by their schools. **RESULTS:** During the spring lockdown, most of the participants from both Canada and Belgium perceived a decrease in their practice of physical activity in comparison to prior to the spring lockdown, reporting important barriers caused by the COVID-19 pandemic. Moreover, a significant decrease in the proportion of participants reporting a strong or a very strong support was observed during the spring lockdown for family, friends, community, and school. Finally, most of the participants indicated that they did not have contact with any of the school team members to discuss about physical activity during that period. **CONCLUSION:** Results of the present study describe a perceived decrease in adolescents' physical activity levels an unsatisfactory overall picture of the social and school support provided to them during the spring 2020 lockdown, encouraging to take a step back and reflect on subsequent adapted strategies.

Keywords: adolescents, physical activity, secondary school, social support, school support, lockdown, COVID-19

INTRODUCTION

In March 2020, daily lives of most human beings worldwide shifted to numerous restrictions as WHO declared the COVID-19 outbreak as a global pandemic (World Health Organization, n.d). Social restrictions were implemented by country authorities such as physical distancing, quarantining, limited travel distances, schools, and border closures. These restrictions, advising people to stay home, have impacted people's lives habits and subsequent reductions of physical activity (PA) levels (Meyer et al., 2020; Stockwell et al., 2021). A recent large-scale study suggested that physical inactivity is the strongest risk factor for severe COVID-19 outcomes (Sallis et al., 2021). Among youth populations, widespread school closures have led to classroom lessons being replaced by home-schooling and online learning. According to Guan et al. (2020), children are mostly active through active travel to school; physical education (PE) and recess; organised sports, games, and dance; active play; and spending time in playgrounds and parks. With the closure of most of those indoor and outdoor places for youth to engage in PA, major declines of PA participation were observed during the COVID-19 lockdown. In Canada, a survey conducted during the COVID-19 pandemic in parents of 1,472 children and adolescents (5–17 years old) revealed that only 3.6% of children (5–11 years) and 2.6% of adolescents (12–17 years) were meeting the international recommendation guidelines (World Health Organization, 2010) of achieving at least 60 minutes per day of moderate to vigorous PA (Moore et al., 2020). Those measures are drastically lower than the 12.7% reported school-aged children/adolescents (5–17 years) meeting the guidelines in 2019 (Rhodes et al., 2019). However, healthy movement behaviours are associated in youth with notable physical and mental health benefits (Carson et al., 2017), including a more robust immune system (Lasselin et al., 2016).

COVID-19-related restrictions bring then additional challenges in engaging youth population in an active lifestyle. To contextualise strategies to this end, socio-ecological models of health behaviours provide a useful framework in which each person is influenced by intra-individual (e.g., enjoyment, motivation), inter-individual (e.g., social support from friends, family, or teachers), physical environment (e.g., sports facilities) and policy (e.g., health care policies) levels of determinants (Sallis et al., 2008). On each level of the socio-ecological model, both physical and social environment prompts for PA were disrupted during the COVID-19 pandemic and it seems interesting to explore whether those determinants were associated with a potential decline of PA practice in youth. Before the COVID-19 outbreak,

the review of Martins et al. (2015) highlighted the significant influence of friends, family, school, and community toward the participation of adolescents (13–18 years) in PA. Friends support, presence and practice have a positive influence on adolescents PA (Bélanger et al., 2011). Parental support is also critical and could be subdivided into logistical support (e.g., transportation to sport activities), encouragement (e.g., providing information and praise for healthy behaviour), and co-activity (e.g., practicing activity together) (Rhodes et al., 2013). The school environment is identified as a privileged place to integrate different interventions targeting young people's PA (McMullen et al., 2015), including those directly undertaken by the PE teacher. School is considered as a cornerstone for increasing daily PA through its influence on inter-individual (e.g., fellow pupils or teachers), physical environment (e.g., PA facilities at school) and policy levels (e.g., school-community partnerships), given that most youth attend school regularly. Martins et al. (2015) observed that PE teachers had a positive influence on youth PA by their encouragement and their engagement in school and community PA. Those statements sound even more relevant as Kovacs et al. (2021) observed that safeguarding PE lessons online contributed to maintain active lifestyle in youth from 10 European countries during the first wave of the COVID-19 outbreak. However, whether the social support is perceived insufficient or sufficient, it could act as a barrier or facilitator of the adoption of an active lifestyle in youth population. For example, Nathan et al. (2018) identified in schools that the availability of the PA staff, the support from school boards, or the teachers' ability to implement the policy were reported as barriers or facilitators to implement school PA policies. The principal aim of this study was then to explore social and school support for PA during COVID-19 pandemic lockdown in youth. Adolescents already represent a population struggling to adopt healthy movement behaviours and the restrictions due to the COVID-19 pandemic could decrease their propensity to succeed. In this context, another specific goal of the study was to investigate how those young people interacted with their school environment during the lockdown and how this could have impacted their actual practice of PA. Surveys have been conducted in Canada (Montréal, province of Quebec) and Belgium (Wallonia Brussels Federation) to provide an international perspective to those outcomes.

METHODS

Overview

The results of this study are based on data collected within two distinct countries using the same methodology. First, in Canada, 17 public secondary schools of the island of Montreal accepted to participate in the study. Seven of the participating secondary schools were English-language schools, while ten of them were French-language schools. The data collection was performed from December 2020 to January 2021. Thereafter, in Belgium, 15 public secondary schools of the Wallonia Brussels Federation accepted to participate in the study. Participating schools were all French-language schools. The data were collected from January to March 2021. In both countries, inclusion criteria for schools were: 1) to offer the regular secondary education program of the region where it stands and 2) to serve the complete secondary education curriculum, which represents grades 7 to 11 in Montreal and grades 7 to 12 in the Wallonia Brussels Federation. All participants and their parents or guardians were fully informed about the nature, goals and protocols of the study and gave their informed consent. All procedures were approved by the Research Ethic Committee on addictions, social inequalities and public health of the Montreal Public Health's department and the Hospital-Faculty Ethics Committee of the University of Liege.

Participants

Inclusion criterion for participants was to be a regular student of one of the participating schools. Two thousand nine hundred and forty-eight Canadian high school students (grades 7 to 11; girls: 52.9%, boys: 43.6%, gender-diverse or unknown: 3.5%) and 1,356 Belgian high school students (grades 7 to 12; girls: 58.4%, boys: 39.7%, gender-diverse or unknown: 1.9%) completed this study.

Questionnaire

Students completed a 15-minute online questionnaire during one of their classroom periods (virtual or in-class). This non-standardized questionnaire was developed by a collaborative research team involving University of Sherbrooke researchers, the Montreal Public Health, the school boards of the Montreal area, the City of Montreal as well as public organizations engaged in the promotion of a physically active lifestyle in adolescents to investigate the adolescents' PA during the spring lockdown period. Within the questionnaire, they were asked to qualitatively compare their PA participation during the spring lockdown period (from the

middle of March to the end of June 2020) to prior to the spring lockdown period (before the middle of March 2020), referring to the last regular in-class learning period. Participants indicated if their PA practice varied during the spring in comparison to the previous winter on a five-level scale (from “decreased significantly” to “increased significantly”). Participants also indicated the perceived social support to PA for two different periods, namely prior to the spring lockdown period and during the spring lockdown period. They were asked to qualitatively qualify on a five-level scale (from “no support” to “very strong support”) the support to PA they perceived from family, friends, community, and school. Moreover, participants reported through multiple choice questions how they interacted with their school environment regarding PA during the spring lockdown. Finally, participants reported their perceived barriers and facilitating factors to PA participation by selecting them from a list, creating new items if needed, and ranking the selected items.

Statistical analysis

Descriptive statistics were calculated for all study variables. Gender and school's level differences in the perceived change in PA were assessed using chi-square tests. A two-proportion bilateral z-test was performed to assess proportional differences in the perceived change in PA and in social support between “prior to the spring lockdown” and “during the spring lockdown” periods. Finally, chi-square tests were performed to assess the differences in the associations between the perceived change in PA with the perceived social support, the school's interaction, and the perceived impact of the use of school's resources during the spring lockdown. Significance was defined at $p < 0.05$. Statistical analysis was performed using SPSS 27 for Windows (IBM Corp., NY, USA) and RStudio software (R Core Team, Vienna, Austria).

RESULTS

During the spring lockdown, most of the participants from both Canada and Belgium perceived a decrease in their practice of PA in comparison to prior to the spring lockdown (see Figure 1). Differences between genders were observed in Canada only. That is, in Canada, a larger proportion of girls than boys perceived an increase in its PA participation during the spring lockdown (20.0% vs 15.7%; $p < 0.05$), while a larger proportion of boys than girls reported having experienced

similar level of PA during the spring lockdown in comparison to prior to the spring lockdown (28.9% vs 22.8%; $p < 0.05$). Proportions of girls and boys who have perceived a decrease in their PA participation during the spring lockdown were similar in both Canada and Belgium. Also, differences between school's levels were observed in both countries, as a larger proportion of older than younger students perceived an increase in their practice of PA during the spring lockdown in comparison to prior to the spring lockdown. Also, in Canada only, a larger proportion of younger than older students reported having experienced similar level of PA during these two periods ($p < 0.05$). Proportions of older and younger students who have perceived a decrease in their PA participation during the spring lockdown were similar.

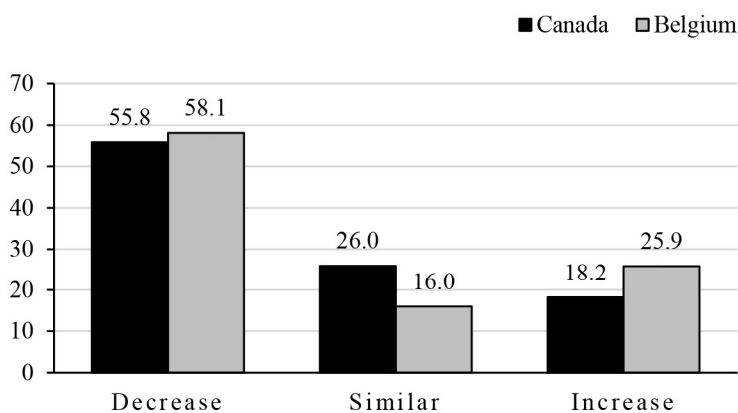


Figure 1. Perceived change in physical activity, in percentage, during COVID-19 spring lockdown in Canadian and Belgian adolescents

Participants have indicated that the COVID-19 pandemic had brought important barriers to their PA participation, such as the unavailability of their desired activity (Canada: 57.4%; Belgium: 59.8%) and the compliance with the sanitary measures (Canada: 31.6%; Belgium: 34.0%). Their lack of motivation also hindered their PA participation (Canada: 35.8%; Belgium: 38.6%), while the three most often identified facilitating factors to PA were to improve their physical fitness (Canada: 56.7%; Belgium: 58.8%), to be with friends (Canada: 57.1%; Belgium: 49.6%), and to get enjoyment from participating in PA (Canada: 40.0%; Belgium: 50.5%).

Table 1 presents the social support toward PA perceived by participants prior to the spring lockdown as well as during the spring lockdown. Significant decrease in the proportion of participants reporting a strong or a very strong support was

observed during the spring lockdown for family, friends, community, and school. Participants who perceived at least one strong support from family, friends, or community in regard to their PA during the spring lockdown were more likely to report an increase (Canada: 21.7% vs 13.5%; Belgium: 31.6% vs 20.6%; $p < 0.05$) and less likely to report a decrease (Canada: 51.5% vs 62.1%, $p < 0.05$; Belgium: 56.0% vs 63.0%; $p = 0.07$) in their PA participation for the same period. Moreover, in Canada strong school support during the spring lockdown was associated with a smaller proportion of participants reporting a decrease in their PA participation (50.6% vs 56.9%; $p < 0.05$) and a larger proportion of participants reporting similar PA (32.1% vs 24.4%; $p < 0.05$) during that period.

Table 1. Perceived social support toward physical activity during COVID-19 spring lockdown in Canadian and Belgian adolescents

Perceived social support	Prior to the spring lockdown		During the spring lockdown	
	Canada	Belgium	Canada	Belgium
Family support, n (%)				
Strong or very strong support	1,552 (55.2)	487 (54.3)	1,327 (47.6)*	427 (47.6)*
No strong support	1,259 (44.8)	410 (45.7)	1,461 (52.4)*	470 (52.4)*
Friends support, n (%)				
Strong or very strong support	1,070 (38.5)	289 (35.0)	834 (30.2)*	260 (31.5)*
No strong support	1,712 (61.5)	537 (65.0)	1,926 (69.8)*	566 (68.5)*
Community support, n (%)				
Strong or very strong support	762 (27.6)	351 (45.0)	487 (17.8)*	214 (27.4)
No strong support	1,995 (72.4)	429 (55.0)	2,251 (82.2)*	566 (72.6)
School support, n (%)				
Strong or very strong support	902 (32.6)	253 (28.9)	549 (19.9)*	171 (19.5)*
No strong support	1,869 (67.4)	623 (71.1)	2,203 (80.1)*	705 (80.5)*

*Significantly different ($p < 0.05$) from "prior to the spring lockdown".

Furthermore, most of the participants indicated that, during the spring lockdown, they did not have contact with any of the school team members to discuss about PA (Canada: 54.2%; Belgium: 59.6%). Participants who had exchanged about PA with one of the school team members did it mostly with their PE teacher (Canada: 17.7%; Belgium: 20.4%). Main contents covered during these exchanges were practice of PA (Canada: 63.9%; Belgium: 60.3%), physical condition (Canada:

48.3%; Belgium: 55.6%), lifestyle habits (Canada: 43.6%; Belgium: 23.0%) and sanitary measures (Canada: 31.8%; Belgium: 13.8%). Resources proposed by school and used by the participants who had contact with one of the school team members during the spring lockdown to discuss about PA differed between Canada and Belgium. That is, in Canada, resources used were mainly websites (18.5%), participation in activities organized by the school (e.g., virtual running, activity breaks; 11.7%), private channels with teachers (e.g., teachers' YouTube channel; 11.5%), and programming proposal including the practice of physical activities (11.3%). In Belgium, resources used were mainly learning kits (40.1%), applications (30.6%), and private channels with teachers (12.5%). In Canada, 36.7% of the participants who had received resources related to the practice of PA from their school had not used them, compared to 18.5% in Belgium. Finally, in Canada, 52.9% of the participants who used these school's resources during the spring lockdown indicated that it has helped them maintain or increase their participation in PA, compared to 35.8% in Belgium. However, no association was observed between the perceived change in PA during the spring lockdown with the fact of having kept contact with one of the school team members to discuss about PA or with the perceived impact of the school's proposed PA-related resources.

DISCUSSION

The present study aimed to explore social and school support for PA during COVID-19 pandemic lockdown in youth, to investigate how those young people interacted with their school environment during that period and how this could have impacted their PA levels. Results of the present study indicate that, in Canada as well as in Belgium, most of the high school students perceived a decrease in their practice of PA during the lockdown. These findings are consistent with previous studies (Bates et al., 2020; Moore et al., 2020) and appear to be directly related to the social restrictions imposed during that lockdown. As expected, the COVID-19 pandemic lockdown had brought important barriers to adolescents' PA participation and has also harmed one of their most important facilitating factors to PA in limiting their capacity to practice PA with friends (Dubuc et al., 2021). Furthermore, we observed that increase in PA during that period was higher in girls and in older students. This result raises questions on how high schools ensure meeting older girls' needs in term of physical activity. Further studies should consider examining this question.

Moreover, during the spring lockdown, participants reported significant decrease of strong or a very strong social support toward PA from family, friends, community, and school. This massive decline in social support is closely related to the global recommendation that individuals must stay home to avoid social interactions and restrain the disease spread. This relative social isolation during the COVID-19 outbreak could potentially increase physical inactivity (Peçanha et al., 2020). Even if staying home mostly meant spending more time with the household family members (e.g., parents, brothers and/or sisters), the perceived reduction of support for PA from those close relatives may seem surprising. A possible explanation could be tied to the multiplicity of tasks that parents had to deal with during teleworking. Work tasks, house tasks, children-related tasks (e.g., homework) at hand simultaneously could result in additional fatigue, reported as a barrier for co-participation, whereby parents facilitate activities in which they can be active with their children (Rhodes & Lim, 2018). However, when present, parental encouragement during COVID-19 outbreak is associated with higher child indoor and outdoor PA, time spent walking and biking, and family PA (Moore et al., 2020). The latter also found that families tended to shift toward more inside and sedentary activities such as crafts, puzzles, games, and video games. Initiatives that could help parents and carers to incorporate PA into youth's daily routines should therefore be supported. Active family breaks, outdoor hikes or "geocaching", co-participation in active video games or channels, or using online health and/or PA apps are examples of activities that could help to achieve the recommended levels of PA in youth (World Health Organization, 2010).

This home-centred lifestyle is also associated with a significant decline in support from friends in both countries. Considered by the participants as the most important facilitating factor for PA, their influence during the lockdown was highly restricted. Before the COVID-19 outbreak, friends' preference and participation in leisure activities being linked or not linked to PA had a major influence on the adoption of physically active behaviours among adolescents (Martins et al., 2015). During the lockdown, those interactions were weakened and probably led to the observed decreased PA participation for those who declared less social support from friends. The study of Tulchin-Francis et al. (2021) exposed that PA with friends, especially outdoor, also decreased in the US during the first lockdown. Common form of social communication between friends has then even more shifted to an online video/chat interaction during this period and could partly explain this reduced support and shared participation in PA. However, those who perceived strong enough support from their friends could have potentially preserved or adjusted their PA habits to the

context they went through. For example, some adolescents could have challenged their friends by taking part in trackers/online fitness challenges or in performing viral dances (e.g., TikTok), whereas others increased their screen-based sedentary inside activities (e.g., video games, phone, or tablet) to keep a social connection with their friends. Helping adolescents to engage in any practice of PA that they would enjoy, valued by friends and that strengthened social relationship provides avenues for PA actors from community and school contexts.

In a socio-ecological perspective of PA promotion (Sallis et al., 2008), those actors are highly valuable, but their support perceived by the participants of this study was also reduced during the COVID-19 spring lockdown. Community impact on PA participation in youth was highly reduced during the first lockdown due to the closure of most of the sport and recreational infrastructures, and subsequently to the coaches and local PA stakeholders who usually manage and supervise activities undertaken in those places. Moreover, because children and adolescents are more active outside than inside, Kovacs et al. (2020) considered that closing outdoor facilities for PA should be considered only as the last resort during lockdowns. Community policies and stakeholders could therefore be informed about the benefits of outdoor play and should be encouraged to set up and facilitate the access of the youth population to those environments. For example, Bates et al. (2020) suggested that local governments could open parks with one-way traffic patterns to promote social distancing outside.

The inclusion of strategies that target environmental changes is also a matter of school-based PA policies. Social support in this specific context is multifaceted and could encompass the principal and teachers' support for PA. This social influence in schools has been highlighted as, together with the availability of PA resources, the most frequently cited facilitators of youth participation in PA (Martins et al., 2015; Nathan et al., 2020). However, due to the schools' closures during the first lockdown of the COVID-19 pandemic, contacts and supports from the school stakeholders were also drastically reduced. Our study revealed that most of the youth had not had any contact with the school team members during this period to discuss about PA. These findings address an important issue because of the essential and cornerstone role of the school environment in the contribution of the adoption of an active lifestyle in youth (Cale & Harris, 2006; McMullen et al., 2015). Evidence also shows that children are less active during unstructured or non-school days (Lin et al., 2018). This appears to be supported by the study results showing that a strong school support during the spring lockdown was associated with a smaller proportion of participants reporting a decrease in their PA participation. During

this first lockdown, PE teachers were the most cited actors within schools for their support of PA in youth. This confirms their central position in PA promotion (Carson et al., 2014). Main contents covered during these exchanges were similar in Canada and Belgium except for lifestyle habits. The recommendation of Guan et al. (2020), outlining that teachers should know and promote active behaviours and embrace opportunities to incorporate healthy movement messages, practices, and policies into daily home-school routines and lessons, foster the need to include health-related learnings in PE.

School and PE teachers' initiatives to promote an active lifestyle were highly challenged during the COVID-19 breakout, resulting in a diversity of PA-related resources that were employed during the first lockdown. In Canada and Belgium, those materials originated mostly from the school in general, the PE teacher online teaching or private channels, or even the use of external PA applications. Considering that more than one out of two participants did not receive social support from the school team members about PA and that a significant number of those who received at least a resource related to the practice of PA from their school had not used them or declared that those resources did not help them to maintain or increase their participation in PA, school support provided to students during the spring 2020 lockdown was insufficient.

There were some limitations to the present study. First, our findings are limited to populations of students from public high schools in Montreal, Canada or in the Wallonia Brussels Federation, Belgium. Nonetheless, our results are strengthened by studying two homogenous populations in very large sample sizes. Also, as the participants completed the questionnaire between December 2020 and March 2021, their answers may be subject to recall biases.

In conclusion, results of the present study describe an unsatisfactory overall picture of the social and school support provided to adolescents during the spring 2020 lockdown, encouraging to take a step back and reflect on subsequent adapted strategies. Creating enjoyable, creative, remote or hybrid learning contents that promote social support and interaction in the youth population is therefore a challenge involving all stakeholders of PA promotion at each level of the socio-ecological model. For example, a comprehensive school PA programs, linking of school PE, the family, and the community, could serve to promote PA in youth with the support of the new online content that has been deployed during the COVID-19 pandemic (Webster et al., 2021).

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