

Thematic Article

Health Education in Primary Schools: A Difficult Task

Philippe Masson¹, Michael Racodon², Alessandro Porrovecchio³, Guillaume Duchateau⁴

Recommended citation:

Masson, P., Racodon, M., Porrovecchio, A., & Duchateau, G. (2022). Health education in primary schools: A difficult task. *Central European Journal of Educational Research*, 4(1), 1–10. <https://doi.org/10.37441/cejrer/2022/4/1/10735>

Abstract

This study was conducted in a medium-sized French city, in a neighbourhood falling into poverty, with children aged from 9 to 10 years old. Its aim is to build an adapted strategy to improve children's healthy habits. Our study was based on a mixed methods interdisciplinary approach using interviews, questionnaires, sleep diaries and accelerometers. The unemployment rate of the target population is above 40%, and the families have four children on average. The children of the sample (N=29) practice less physical activity than recommended by the institutions in charge of health matters. The parents correctly manage the sleep cycles of their children, and stand firm when they have to go to school the next day. When the next day is a non-school day, children play more video games in the evening, both on their own and with their families. Healthy habits can be improved through cooperation with the various members of the educational community (parents, teachers and structures in charge of the children). Since it is difficult to manage health education solely during PE classes, this process must be continued both inside and outside school by the community, even more so the family.

Keywords: Physical Education, Health Determinants, Obesity, Sleep, Health habits, Community health

Introduction

All problems cannot be solved by school alone. This is the case for health education, although it is a national priority in France. This study highlights the difficulties teachers face in trying to reach the objectives set by the Ministry of Education (2010, 2020). Similarly, following the advice given by the Programme National Nutrition Santé (Ministry of Health, PNNS – National Programme for Nutrition and Health, 2011–2015, 2015–2019 and 2019–2023) and by the Institut National de Prévention et d'Éducation pour la Santé (INPES – National Institute for Health Prevention and Education or Santé Publique France – French Public Health) is not an easy task. The starting point of this study is the following question: “What do children do when they are not at school?”. Although it seems like a simple question, finding an answer means taking into account both children's surrounding environment and their practices. Thus, there is a need to identify and quantify the physical activity of the children and the factors influencing it when they are in and out of school.

The analytical framework we used follows the adaptation of Janosz' risk factors approach (Janosz & Le Blanc, 1996), that counts four factors (family, surrounding environment, peers and school). We also used some elements from Booth et al.'s approach (Booth et al., 2001) regarding the factors that influence the practice of physical activity (societal, political and legislative, micro-environmental, interpersonal and individual). This analytical framework was applied to the whole study (interviews, questionnaires and interventions with the parents during the individual feedbacks on the results).

¹ Univ. Lille, Univ. Littoral Côte d'Opale, Univ. Artois, ULR 7369 – URePSSS – Unité de Recherche Pluridisciplinaire Sport Santé Société, F-59000 Lille, France, philippe.masson@univ-lille.fr

² Clinique de la Mitterie, Lille, France michaelracodon@yahoo.fr

³ Univ. Littoral Côte d'Opale, Univ. Lille, Univ. Artois, ULR 7369 – URePSSS – Unité de Recherche Pluridisciplinaire Sport Santé Société, F-59383 Dunkerque, France, alessandro.porrovecchio@univ-littoral.fr (*optional*: corresponding author)

⁴ Univ. Littoral Côte d'Opale, TVES Territoires, Villes, Environnement & Société. ULR4477 Dunkerque, France guillaume.duchateau@univ-littoral.fr

Context

The objectives of Physical Education

Physical Education (PE) has been contributing to health education for a long time (Perrin, 1993). It has always been a clear goal, although the very idea of health now has more aspects than it used to. It went from focusing on the mere physical dimension, to becoming a global approach toward health that includes the physical, psychological and social dimensions. PE has a major role in elementary school, with an average practice time of 3 hours a week, mostly aimed at developing and then reinforcing motor abilities. When health education starts in Primary school (years 4 to 6), the learning activities focus more on physical health. Piéron (1996) and Perrin (2003) noticed that because of the time schedules, it was difficult for PE to reach the given objectives.

However, the PNNS, directed by the French Ministry of Health, aims at improving the health of the population via two main decisive factors -nutrition and physical activity. A priority of the programme is to stabilise the prevalence of obesity among the youth. With no definite consensus, the public health bodies indicate that the young should practice a minimum of 60 minutes of moderate or intense activity per day, through sports, games, or daily activities (WHO, 2010; 2020).

Despite the considerable efforts made over the last few years to promote a healthy lifestyle, the figures for overweightness and obesity have increased drastically (Haute Autorité de Santé, 2011) and more precisely among children, teenagers (Shields, 2006), and adults (Shields & Tjepkema, 2006). Katzmarzyk & Tremblay (2007) have shown that, although there is a tendency to physical inactivity, it goes against the increasing prevalence of chronic diseases linked with a sedentary lifestyle. The apparent contradiction between the data can be related to non-declared physical activity, or to an inadequate measurement of the total physical activity of the population. Some inconsistencies may result from the fact that some changes in other aspects of the total energy expenditure were not taken into account, like the thermogenesis generated by other activities than physical exercise, and/or the structure of sleep. Considering the structured physical activity, practiced on purpose (generally during leisure time), as the main indicator for the active energy expenditure, can lead to forgetting about other forms of physical activity that have an influence on health.

Setting up objective physical activity measuring tools, such as the accelerometers, allows us to establish detailed profiles of the physical activity and inactivity. Thanks to this data, it is possible to evaluate more precisely the mobility patterns of a given person and to observe the links between physical activity, physical inactivity, and health (Esliger, 2007).

The links between sleep and obesity

Studying the effects of experimental sleep restriction drew attention to the detrimental effects of sleep on the metabolic and cardiovascular balance. Restricting sleep for a few days increases hunger and appetite (by acting on regulation hormones like leptin and ghrelin) and increases insulin resistance, thus creating a pre-diabetic condition. Many research teams focused on the links between the duration of sleep and health condition (Grandner, 2017).

Short sleep time:

- increases the risk of obesity by 55% for an adult, and 89% for a child (based on an average 7-hour sleep).
- causes obesity, as the risk is doubled for every hour missed.

Research design and Methods

Context of the study

The study was conducted in a very old area (about 6,500 inhabitants) of a city (80,000 inhabitants) situated in the French region of the Pas-de-Calais, mostly composed of individual homes in bad condition. The data issued by the INSEE (the French Institute for Statistics and Economic Studies, 2020) reveals an unemployment rate of about 40%. Moreover, 40% of the inhabitants have no qualification, and most families are large (single-parent families with 4 children on average). The area is falling into poverty and draws the attention of the local social services. It is currently being renovated (Programme National Rénovation Quartiers Anciens Dégradés, 2008).

The population under study

Our study focuses on two end-of-Primary school voluntary classes, with 9- and 10-year old children. The parents of 29 out of the 32 children (16 girls, 13 boys) were willing to participate to the study. By doing so, they agreed:

- To participate in an interview about physical activity and school in general.
- That their children fill out a questionnaire, after the questions were explained in the classroom on the first day of the study.
- To keep a logbook and a sleep diary, in which they had to write down their children's bedtime and waking time, to be filled out by the teachers and researchers every morning when school started.
- For their children's height and weight to be measured in class by the researchers.
- That their children carry an accelerometer for a week, from the moment they get up until they go to bed.

Using actigraphy, we wanted to measure the type of physical activity practiced by the children in and out of school. The use of an accelerometer is a non-invasive method to record the movements of the human body and thus to quantify physical activity. The data is digitalised in a computer. For this study, we used the model GT3X that measures physical activity on three axes (vertical, anteroposterior and mediolateral).

We used the following definition of physical activity: "any bodily movement produced by the skeletal muscles, triggering a substantial increase in the energy expenditure, above the energy expenditure at rest" (United States. Public Health Service, 2001). Based on data from Vanhelst et al. (2011), we could qualify the data we obtained for 10-year-old children, using an accelerometer. Each child had to wear a device for the entire week.

The sleep diary

The sleep (Monk et al., 1994) diary was used to report the daytime and nighttime hours of sleep. We linked this subjective data with the objective data obtained through actigraphy. They give information about how the subject sleeps, and the organisation of his long-term sleep structure (from one week to several months). Using this diary made it easier to analyse the sleep pattern disorders, like late or early sleep phases, brought a better definition of the semiology of insomnia (difficulties falling asleep, early awakening, irregular sleep), and a better analysis of the consequences of hypersomnia on daytime vigilance. We also used the diary for therapeutic follow-up, allowing the progressive reduction of the hypnotics to the objective explorations like actigraphy, and as a basic tool to talk with the children about their sleep disorders.

Conducting the study

We conducted the study over three months, starting with the parents' interviews. Then, the children from both classes had to wear an accelerometer for a week while filling in their sleeping diaries and logbooks as aforementioned. The questionnaires were given in class on the first day. Finally, after processing the results, we gave them to the volunteer parents individually. We presented the results to the city officials, who then called for the regular help of sport educators on Wednesday afternoons and Saturdays, to welcome all children willing to participate in a sports activity in the schoolyard

Methodology for result analysis

We divided the data into two categories for the results to be easier to read:

- Qualitatively (interviews with the parents, analysis of the logbook, sleeping diary, and questionnaires -as there were only a few of them (N=29). We analysed the interviews with the volunteer parents using a content analysis software (Wordmapper), which helped find out the themes.
- Quantitatively, with the analysis of the data obtained via the actigraphs.

The anonymity of the subjects was preserved and the documents (interview recordings, sleep diaries, logbooks and questionnaires) were destroyed after the data was processed.

Results

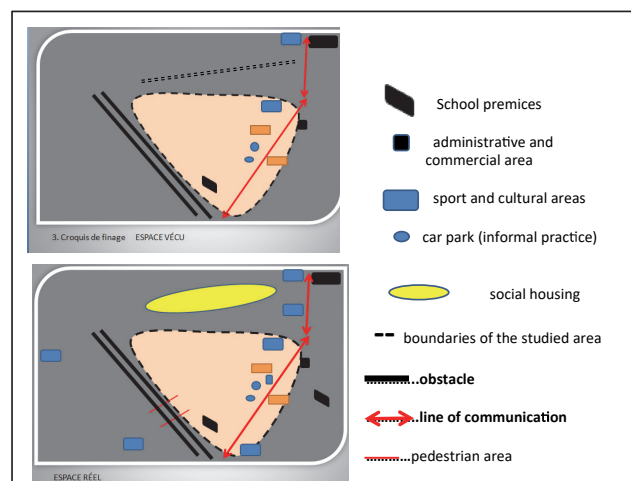
Qualitative data

The profile of the parents

The parents are not physically active; only four families declared practicing any form of physical activity. Nineteen families are affected by unemployment. In eleven families, both parents are unemployed. For the remaining eight families, only one of the parents is unemployed. In other words, about 60% of the children come from a family affected by unemployment. These statistics correspond to the data of the INSEE concerning the neighbourhood (INSEE, 2020).

The interviews with the parents revealed that they often spend a lot of time watching television or playing videogames, sometimes with their children. Some parents declared that playing specific videogames (e.g. the Wii) was similar to practicing sport. When the parents answered questions about the practice area, it appeared that they had a particular perception of the area in which they live. We can notice a difference between the actual and perceived environment, as appears in the following two diagrams.

Figure 1. Actual environment, perceived environment



As we can see, the interviewed parents do not use all the nearby cultural and sports facilities available in their area. The facilities to the North of the diagram are a leisure centre, with a bad reputation that is seen as too expensive, and a Maison Pour Tous (Youth centre), that parents say is “not for them” because of the offered activities and prices. The space to the West of the diagram, also forgotten, represents the national stage, too far for consideration. Finally, they ignore the very active dance centre, near the informal recreational area (parking lot).

The sampled parents are very attached to their children’s results at school, a fact confirmed by the teachers of both classes.

The sleep diary and the matter of sleep

The analysis of the sleeping diaries reveals that during school days, the children on average go to bed around 9 p.m., and sleep for 10 hours. When there is no school the next day, even if the children go to bed around 10 p.m., the variations are more important (standard deviation: 5.46). Their sleeping time is about the same duration, 9 hours 46 minutes.

The physical activity of the children out of school

“Practicing a sport” is the term used naturally by the children when talking about physical activity. It can take place in a structure, or informally in the streets -more precisely, in two particular car parks situated in the neighbourhood. Twenty-five out of the 29 children practice a physical activity in a club, or informally in the street. Ten of them are members of a club. The streets and nearby car parks are active parts of the neighbourhood and also are the favourite recreational spaces. In total, four children (two girls and two boys) practice no physical activity in a club or in the street.

Table 1. The type of practice following gender and area

	<i>Practice in club</i>	<i>Practice in the street</i>				
Gender	Club, member	Club, non-member	Practice a sport in street	No practice sport in street	No practice	Practice (club or street)
Girl	6	10	12	4	2	14
Boy	4	9	10	3	2	11
Total	10	19	22	7	4	25

The data suggests that the children practice a physical activity, although qualifying it is impossible.

Quantitative data

The Body Mass Index (BMI)

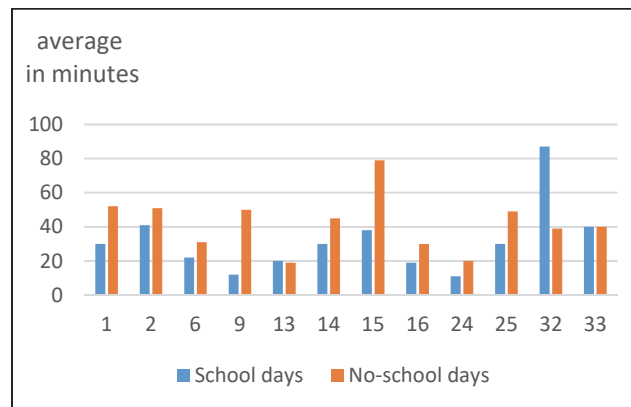
We observe a lot of overweight children. In our sample, 35 percent of them are overweight, and 10 out of 12 suffer from type 2 obesity. Using the Chi2 test, we notice a significant difference ($p < 10^{-4}$). We observe girls suffer from class 1 obesity, and boys suffer from class 2 obesity.

Physical activity of the children during the week

Two devices were dysfunctional, and the results from 14 other devices could not be utilised for various reasons (the child forgot to carry it for a day (8), nonsensical data (6)). In the end, the reliable data we were able to use came from 13 children: eight girls and five boys.

First, we summarised the data for each child following their physical activity, classified from moderate to vigorous, and we separated the school days from the non-school days.

This data is expressed in the following graph:

Figure 2. Daily average time of the physical activity of the children, school days and non-school days (in minutes)

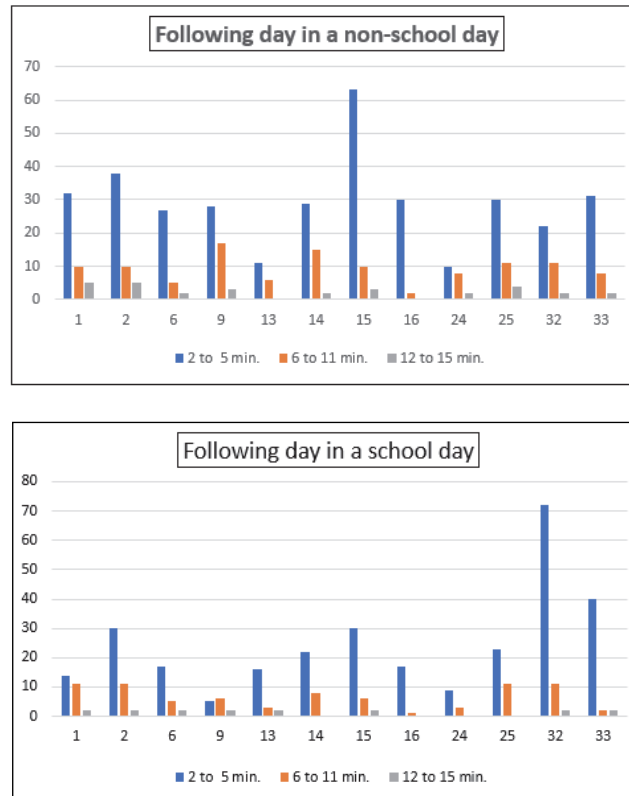
There is a major difference between the days with and without school. Using Student t-test, we notice a significant difference in the average, above 95%. It means that the observed difference in the quantity of physical activity during the non-school days is not coincidental, but it is significant. This first table suggests that there is actual physical activity. Still, the average corresponds to the sum of the observations, independently from the duration of the activity -that is to say that any physical activity with a duration of at least one minute is taken into account, even if it is isolated. It is then necessary to classify the data in different ways.

Moderate to vigorous physical activity

Here we will focus on the activity values when the sum of the observations per minute can be qualified as vigorous to intense activity. We can see that, mostly, the activity duration during school days is inferior to 6 minutes. Although this tendency remains the same for non-school days, the physical efforts are longer (>5 to 10 minutes).

The following graph represents the variations. The left part represents the physical activity during school time. There is vigorous to intense activity, but mostly lasting from 2 to 5 minutes. The figures are not better during school days, even if more children practice short-duration efforts.

Figure 3. Effort duration per subject, during school days and non-school days



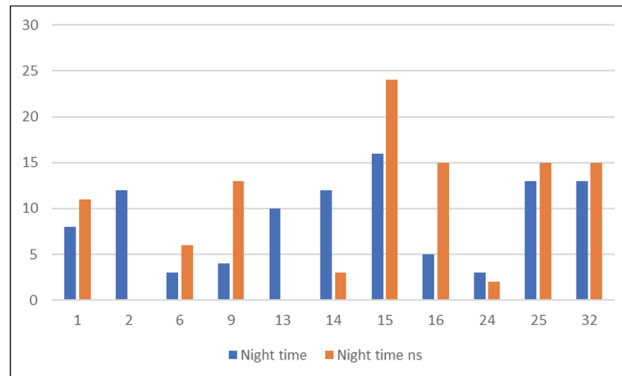
Important times of the day

For an even more accurate analysis, we can focus more precisely on the different periods of the day during school days. Using the school's timetable, we can see that there is much activity during the breaks (morning, lunch and afternoon). This precision is possible due to the actigraphs which record the data by the hour.

There is much physical activity at mid-day during non-school days. The logbooks filled in by the children reveal that they take part in outdoor activities with their peers. We can hypothesize that the children take a short break for lunch, during which they are usually on their own. It would be reasonable to think that lunchtime could be a special moment spent with at least one of the two parents, considering a large proportion of them are unemployed. Similarly, the city council services in charge of early childhood count many children with unemployed parents in nursery schools.

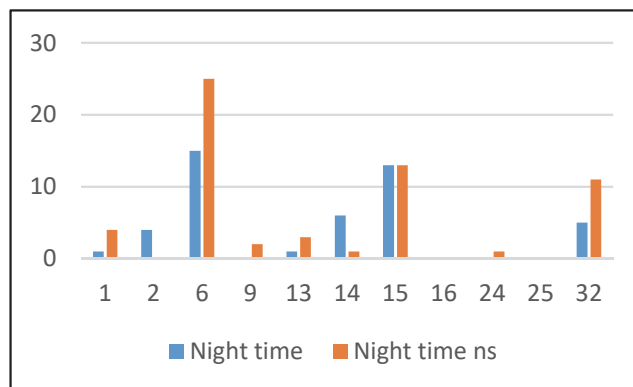
The following two figures show the cases of evening and night times. We define the evening time as the moment after school and before dinner, on average between 5 p.m. and 8 p.m. for the families of our sample. We define nighttime as the moment after dinner and before the child goes to bed. There is a noticeable difference between school days and non-school days, regarding physical activity during nighttime, for an important part of the sample.

Figure 4. Difference between the nighttime duration of physical activity during school days (night time) and non-school days (night time ns).



During non-school days, the children practice physical activity in the nighttime. Similar to the evening time, not all children are concerned. The logbooks show that the physical practice takes place at home, and it then corresponds to the practice of video games, alone or with the family. This “physical” activity is a significant part of the children’s daily average activity.

Figure 5. Part of the vigorous to strong physical activity “nighttime during school days (nighttime) and “nighttime during non-school days” (nighttime ns)



Discussion

Physical activity

We can see that the objectives set by the WHO 9-10 are not attained during non-school days, and even less so during schooltime school days. We agree with Baquet et al. (2006), who points out the low impact of PE classes on physical condition, even if “[...] PE contributes to health education, by bringing the children a better knowledge of their body, and to security education, by taking controlled risks” (Ministry of Education, 2008). The idea here is not to put the full responsibility on the teachers, but to show that the modes of organisation, the programmes, and the facilities are not adequate to meet the objectives recommended by the WHO for good physical health (60 minutes of intense moderate to intense activity daily, WHO, 2010; 2020) during a PE session.

On average, the children practice more physical activity in a club or in the streets with short efforts. The moments chosen for physical practice on non-school days are surprising, as they show an absence of points of reference (for example set times for meals), even though 60% of the children live in a family affected by unemployment. The parents rarely practice any physical activity at all. The second element highlighted by the study is the significant amount of time dedicated to the practice of video games; for some, videogames seem to replace traditional sport practice. Even if videogames definitely reinforce the relationship between the children and their parents (as they practice it together), we did not observe any kind of moderate to intense physical

activity while the children played video games. It merely increases the amount of time spent in front of a screen and has a negative impact on sleep when practiced before bedtime.

The influence of the family

Meeting the parents for a general introduction of the study, and then for one-to-one feedback, was an opportunity to exchange ideas and to raise awareness regarding the importance of physical activity, nutrition, and sleep. Every parent received a booklet with their child's results. Eighteen out of 29 parents came to the meeting, showing an obvious interest, even for those whose data could not be validated.

The influence of family life and peers are key factors that motivate the young to be active¹⁸. Meeting the parents for individual meetings highlighted a lack of awareness about the benefits of daily physical activity. The time spent with the parents and/or representatives was another opportunity to inform them, as they easily admitted to being "aware" of the different preventative campaigns. It is true that the area is rather underdeveloped with regards to sport facilities accessible to these families. The results of these interviews suggest that the clubs' joining fees and the impact of television and video games are detrimental to the practice of any kind of physical activity, be it formal or informal. We can also see that the perception of space can be a factor for non-practice, and that it is necessary to take this element into account to modify the relationship of the population with their place of practice.

It seems that the parents who are aware of the importance of school, and the importance of an early bedtime. They manage to send their children to bed early when the next day is a school day and are more permissive the other days. With regards this last aspect that we studied thanks to the sleeping diaries, but did not analyse too deeply, it seems that the children do not sleep enough. In an empirical way, the teachers had already noticed it, and in the last few years, the school starting time in the morning has been postponed 45 minutes compared to the neighbouring school (8.45 a.m. versus 8 a.m. for the private school located a few hundred yards away).

The matter of excess weight

Our study reveals that 35 percent of the children in our sample are overweight. Today in France, the prevalence of child and teenage obesity is increasing constantly and has reached 16 percent. The phenomenon has become a major public health issue due to the fact that obese children tend to remain obese into adulthood, and because there are sanitary, economic and social impacts. The literature shows that obese children are less active and spend more time watching television or playing videogames than non-obese children. They have more muscle mass and strength in their arms and legs to support their weight, but they have difficulties moving around. Today, obesity is recognised as a multi-factor pathology, and its development comes from multiple interactions between genes and environment. However, obesity is now developing at a pace that is hardly compatible with the hypothesis that it is of genetic origin. The specialists of this pathology consider the environmental and behavioural factors to be decisive factors of this etiology. Now, one third of adult obesity cases start during childhood and adolescence. Parental obesity doubles or triples the risk of obesity for the child. It seems obvious that if the children follow the example given by their parents and adopt a sedentary lifestyle or bad eating habits, they will have little chance to return to a healthy weight as adults. For the children, Epstein & al. (2003) attempted to combine nutritional and behavioural interventions with physical activity within the family over a ten years long study. The results show that the children that were followed up reduced their weight by 5% compared to their weight at the beginning of the study, and then maintained it. These results lead us to think that an intervention aiming at modifying the behaviour of the whole family could help to maintain a steady weight in the long term. However, Frémeaux et al.'s works (2011) go against the recommendations of the institutions in charge of Public Health. It actually seems that promoting physical activity to fight childhood obesity would not be a good strategy. Indeed, although the most ambitious programmes (more playing areas, more sport educators, etc.) seem like a good solution to increase the physical activity of children, there seems to be no effect on their BMI. The explanation could lie in the "Activitystat Hypothesis" (Rowland, 1998). Following this hypothesis, the total energy expenditure of an individual would be "programmed genetically", and thus any physical activity imposed at a given moment would be compensated by a decrease in the physical activity at another moment.

Perspective

French school programs do not favor the inclusion of a beneficial physical activity for health under the WHO. It is therefore necessary to adopt other strategies, to work in partnership with parents, medical services and various agencies in charge of youth. We have also to take into account the recommendation given by WHO (2018) for the period 2018-2030 about physical activity, especially for the under-privileged.

Conclusions

It is by acting together with the various members of the educational community (parents, teachers and structures in charge of the children) that healthy habits can be developed (Duchateau & Masson, 2011). As Pot & all (2014) noticed in a similar study, parents are the main influencers of the sport habitus. We arrive at the same conclusion: belonging to a family with a low socio-economic status functions as a barrier to accessing sport. It is difficult to manage health education solely during PE classes; it is a process that must be continued both inside and outside of school by the community, especially by the family. This question of the creation of a health habitus also raises the problem of the youths' sedentary lifestyle, in areas where integrating spaces for physical activity is impossible. The problem is then the territorial organization and how school-focused health promotion through physical education Wiltshire & all (2017).

The last question raised is the one of the mobility of children and teenagers, which is a key element in the socialisation and behaviour at this stage of life. It is a basis for the progressive process of autonomy with regards to the main traditional socialisation bodies, school and family. Acquiring autonomy mainly follows two steps: first, being able to go somewhere without the parents, by going with peers; on a second level, being able to access some places and face the alterity inherent to collaboration in a public space. This process obviously depends on the living environment, and on how far it is from the centre of the conurbation. Furthermore, focusing more specifically on the teenagers coming from "sensitive" neighbourhoods leads us to think about the possible impact mobility has on segregation. These consequences are rarely taken into account by most studies about segregation, especially in the theses that use these areas as typical examples of urban fragmentation.

Acknowledgments: We thank Johnathan Dabney for the English language editing.

References

- Baquet, G., Twisk, J. W., Kemper, H. C., Van Praagh, E., & Berthoin, S. (2006). Longitudinal follow-up of fitness during childhood: interaction with physical activity. *American journal of human biology*, 18(1), 51–58.
- Booth, S. L., Sallis, J. F., Ritenbaugh, C., Hill, J. O., Birch, L. L., Frank, L. D., et al. & Hays, N. P. (2001). Environmental and societal factors affect food choice and physical activity: rationale, influences, and leverage points. *Nutrition reviews*, 59(3), S21–S36.
- Duchateau, G., Masson, P. (2011). Etude de la mise en place des « bonnes pratiques » de santé dans un quartier défavorisé [Study of the implementation of «good health practices» in a disadvantaged neighbourhood]. In C. Spallanzani, R. Goyette, M. Roy, S. Turcotte, J. F. Desbiens, & S. Beaudoin. *Mieux former pour agir dans une société en mouvement: Actes de colloque de l'ARIS 2010*. Presses de l'Université du Québec (PUQ).
- Esliger, D. W., & Tremblay, M. S. (2007). Physical activity and inactivity profiling: the next generation. *Applied Physiology, Nutrition and Metabolism*, 32(S2E), S195–S207.
- Epstein, L. H., Valoski, A., Wing, R. R., & McCurley, J. (1994). Ten-year outcomes of behavioral family-based treatment for childhood obesity. *Health psychology*, 13(5), 373.
- Frémeaux, A. E., Mallam, K. M., Metcalf, B. S., Hosking, J., Voss, L. D., & Wilkin, T. J. (2011). The impact of school-time activity on total physical activity: the activitystat hypothesis (EarlyBird 46). *International journal of obesity*, 35(10), 1277–1283.
- Grandner, M.A. (2017). Sleep, health, and society. *Sleep medicine clinics*, 12(1), 1–22.
- Haute Autorité de Santé (2011). *Surpoids et obésité de l'adulte : prise en charge médicale de premier recours. Recommandations pour la pratique clinique*. [Overweight and obesity in adults: primary care medical management. Recommendations for clinical practice].
- INSEE (2020). *Portrait social* [Social portrait]. INSEE Référence.
- Janosz, M., & Le Blanc, M. (1996). Pour une vision intégrative des facteurs reliés à l'abandon scolaire [For an integrative view of factors related to school dropout]. *Revue Canadienne de Psycho-éducation*, 25(1), 61–88.

- Katzmarzyk, P. T., & Tremblay, M. S. (2007). Limitations of Canada's physical activity data: implications for monitoring trends. *Applied Physiology, Nutrition and Metabolism*, 32(S2E), S185–S194.
- Ministry of Education (France). BO special edition, n°3, June 19th, 2008.
- Ministry of Education (France). BO n°11, March 18th, 2010.
- Ministry of Education (France). Code de l'Éducation, 2020
- Ministry of Health (France). *Programme National Nutrition Santé*. (2011–2015, 2015–2019 and 2019–2023) [National Program Health Nutrition].
- Monk, T. H., Reynolds III, C. F., Kupfer, D. J., Buysse, D. J., Coble, P. A., Hayes, A. J., et al. & Ritenour, A. M. (1994). The Pittsburgh sleep diary. *Journal of sleep research*, 3(2), 111–120.
- Perrin, C. (1993). Analyse des relations entre le rapport aux APS et les conceptions de la santé [Analysis of the relationship between the relation to physical and sport activities and conceptions of health]. STAPS. *Sciences et techniques des activités physiques et sportives*, 31, 21–30.
- Perrin, C. (2003). Education pour la santé et Education Physique et Sportive : un pont à consolider [Health Education and Physical and Sports Education: a bridge to build]. *La Sante de l'Homme*, 364, 9–47
- Piéron, M. (1996). Qu'attendre des APS en matière de santé? [What can we expect from physical and sport activities for health?]. *Revue EPS*, 29.
- Pot, N., Verbeek, J., van der Zwan, J. & van Hilvoorde, I. (2016). Socialisation into organised sports of young adolescents with a lower socio-economic status. *Sport, Education and Society*, 21(3), 319–338.
- Programme National Rénovation Quartiers Anciens Dégradés (PNRQAD) (2008). *Rapport au Ministre du logement et de la ville présenté par l'Agence nationale pour la rénovation urbaine* [Report to the Minister of Housing and Urban Affairs presented by the National Agency for Urban Renewal]. Public Health Agency of Canada.
- Rowland, T.W. (1998). The biological basis of physical activity. *Med Sci Sports Exerc*, 30, 392–399.
- Shields, M. (2006). Overweight and obesity among children and youth. *Health Rep*, 17(3), 27–42.
- Shields, M. (2006). Tjepkema M. Trends in adult obesity. *Health reports*, 17(3), 53.
- United States. Public Health Service. Office of the Surgeon General, United States. Office of Disease Prevention, Health Promotion, Centers for Disease Control, & Prevention (US). (2001). The Surgeon General's call to action to prevent and decrease overweight and obesity. US Government Printing Office.
- Vanhelst, J., Béghin, L., Turck, D., & Gottrand, F. (2011). New validated thresholds for various intensities of physical activity in adolescents using the Actigraph accelerometer. *International Journal of Rehabilitation Research*, 34(2), 175–177.
- Wiltshire G., Lee J. & Williams O., (2017) Understanding the reproduction of health inequalities: physical activity, social class and Bourdieu's habitus. *Sport, Education and Society*, 24(3), 226–240. <https://doi.org/10.1080/13573322.2017.1367657>
- WHO (2010). *Global recommendations on physical activity for health*. World Health Organization.
- WHO (2018). *Global action plan on physical activity 2018–2030: more active people for a healthier world*. World Health Organization.
- WHO (2020). *Guidelines on physical activity and sedentary behaviour*. World Health Organization.

