

## Children's outdoor movement education: position statement

TORTELLA, P.<sup>1</sup>, CECILIANI, A.<sup>2</sup>, FUMAGALLI, G.<sup>3</sup>, JIDOVITSEFF, B.<sup>4</sup>, WAINWRIGHT, N.<sup>5</sup>, FJORTOFT, I.<sup>6</sup>, SIGMUNDSSON, H.<sup>7</sup>, HAGA, M.<sup>8</sup>, SGRÒ, F.<sup>9</sup>, LIPOMA, M.<sup>10</sup>, SÄÄKSLAHTI, A.<sup>11</sup>

<sup>1</sup> Free University of Bolzano, ITALY

<sup>2</sup> University of Bologna, ITALY

<sup>3</sup> Center for Research in Child Motor Development, University of Verona, ITALY

<sup>4</sup> University of Liege, BELGIUM

<sup>5</sup> University of Wales Trinity Saint David, GB

<sup>6</sup> University of South-East Norway, NORWAY

<sup>7,8</sup> Norwegian University of Science and Technology, NTNU, NORWAY

<sup>7</sup> Reykjavik University, ICELAND

<sup>9,10</sup> University of Enna "Kore", ITALY

<sup>11</sup> University of Jyväskylä, FINLAND

Published online: February 28, 2021

(Accepted for publication February 22, 2021)

DOI:10.7752/jpes.2021.s1046

### Abstract

This position statement follows to the thematic round table organized by S.I.E.M.eS. (*Italian Society of Movement and Sport Education*) as final event of the international congress on "Outdoor movement education" held in Bozen, Italy, december 3-5, 2020. Today's lifestyle with interesting electronic devices attracts young children to spend time inside instead going out to play in a physically active manner. At the same time, recent research evidence has shown that outdoor active play (outdoor play) offers multiple advantages to children's development and health. In December 2020, the University of Bozen organized an international congress on the relevance of outdoor movement education and outdoor play. The Congress ended with a round table discussion of the different approaches to outdoor movement education practiced in Europe, and the need for a common position statement was agreed on that would involve other scientists who participated in the Congress. The position statement is based on comparison of the different practices in European countries and is aimed at defining a consensus in terms of approaches and terminology for outdoor movement education that may be shared between European educators. The comparative analysis was conducted between different regions of Europe: south (Italy), middle (Wales and Belgium, Wallonia), and north (Finland, Iceland and Norway). Comparisons of the different regions were based on official national documents, including laws, educational curriculums, and research findings. Results revealed that some regions, mostly the Nordic Countries, have a strong outdoor culture on which the official national documents are based. In these countries, the outdoor environment is included in teacher education programmes and national curriculums for early education and elementary school. This is not the case everywhere in Europe, where other countries are now starting to spread the outdoor culture in the school environment. On the other hand, there is a need for more research-based knowledge about the amount and types of children's outdoor movement in all regions, including the most advanced ones. With this position statement, the Congress participants and organizers underscore the need to increase the knowledge of the importance of outdoor play in supporting children's motor development and holistic development. There is a compelling need to change official documents to guarantee adequate possibilities for outdoor movement education and outdoor active play. The outdoor environment should become part of the daily pedagogical routine of children, and special care should be given to active movement. The aim of this position statement is to help to reach a consensus in the educational community that must act in collaboration with multiple sociocultural players and stakeholders (at local, national and European levels) and be driven by scientific research.

**Keywords:** outdoor play, physical activity, motor competence, recommendations, outdoor active play, outdoor movement education

**Note:** *The Position Statement has been endorsed by the S.I.E.M.eS. - Italian Society of Movement and Sport Education.*

### Introduction

A major problem faced by present-day modern societies is related to a decreased level of physical activity and an increase in sedentariness. Scientific evidence has accumulated indicating that this situation predisposes children, adolescents, adults and the elderly to an increased risk of cardiovascular and metabolic

diseases, including type II diabetes and colon cancer. Guidelines on physical activity levels for health recommend moderate to vigorous and intense amounts of physical activity for different age groups (WHO, 2008, 2019, 2020).

The COVID-19 pandemic marked a change in human behavior that will persist for a long time. In late 2019 and early 2020, when the world became aware that something new was happening, nobody was prepared for such a serious problem. In addition to the many people who have died from the viral infection, many others were suffered from a variety of disorders, including psychological, anxiety, stress, and relationship problems (Haig-Ferguson et al., 2020).

Children have perhaps suffered most from this situation. To various extent, children have suffered from isolation from friends and grandparents, cousins, and various relatives; also, they have frequently faced nutrition problems, decreased opportunities for exercise, and an increase in sedentary lifestyle due in part to the rise of digital technologies (Cachòn-Zagalaz et al., 2020). In particular, children have expressed psychological distress due not being able to play outdoors with their friends (Singh et al., 2020; Lee, 2020; Liu et al., 2020; Zhai & Du, 2020). Before the pandemic, physical activity levels in most European countries were below the recommendation guidelines (Ng et al., 2014); during the pandemic, the situation was exacerbated, and the amount and intensity of physical activity levels have further decreased (Bates et al., 2020). This is even more problematic when we note that children's overweight was already recognized as a serious global pandemic two decades ago (Kimm & Obarzanek, 2002).

International health agencies recommend several protective measures, such as distancing between people and the use of a mask to protect the nose and mouth; they also recommend spending a lot of time outdoors, where spaces are larger and the risk of infection lower (Wong et al., 2020; Anderson et al., 2020). Indeed, data indicate that physical activity and sport promote physical and mental health, and when done outdoors (walking, biking, orienteering, etc.) they also decrease levels of anxiety and boredom and feelings of loneliness (Sunhee Park et al., 2020). Undertaking outdoor activity in open spaces and parks is an excellent strategy for increasing levels of vigorous and intense activity and for allowing children to play, sunbathe, and have fun (Nicaise et al., 2011; Hustyi et al., 2012; Aronsson et al., 2015; Tortella et al., 2019). Different cultural traditions may have different views on outdoor activity. Some countries, such as Canada and Finland, have highlighted the important role of active outdoor play in the full realization of children's rights (Tremblay et al., 2010, Finnish Ministry of Education and Culture, 2016:35). Thus, child education should consider the advantages that outside activities bring to the children. In some countries (especially Nordic countries), children spend some hours of the day outside; this is part of an education approach that places the environment at the center of human society and promotes in children a respect for nature and understanding of the fragility of the ecosystem that we are living in. Though this is an important achievement, it does not directly address the need for physical activity. Children are usually physically active when playing; however, this is not always the case. As educators, a better definition of the terminology to be used is of fundamental relevance.

Through the Congress organized by the Free University of Bozen, we attempted to establish unambiguous terminology to be used by educators aiming to educate children about or with movement and physically active play. When we talk about "Outdoor Movement Education", we focus attention on the important pedagogical and educational role of the adult, who has the responsibility to design educational actions directed at promoting motor and physical activity of children and, as a consequence, children's participation in sport. This educational approach has a larger impact on the child as it has the potential to promote not only motor skills and competence but also the cognitive, social, relational, and affective development of the child. The educational action designed by the adult is oriented to the needs of the child and may be organized with structured or unstructured activities. Whichever the type of activity, the choice of the environment and location (affordances) is part of the educational process. The choice of the physical environment is fundamental because its affordances may or may not contribute to activating the child at various levels, including physical activity (Fjørtoft, 2001; Niemistö et al., 2020). The term Outdoor Movement Education represents the role of education in physical activity and motor development of the child, in an outdoor environment. With this position statement, we review the differences existing in the management of physical activity education in countries of different areas of Europe and provide a list of recommendations that may be considered by all educational systems to potentiate the use of Outdoor Movement Education as a tool to improve the future of our children and to contrast the negative effects that the COVID-19 pandemic is expected to have on the quality of life of youngest generation.

## Materials and Methods

The material for this analysis includes national documents from six different European regions. The six regions are parts of Europe differing in the nature of their environment and cultural traditions; they are located in the south (Italy), the centre (Wallonian part of Belgium and Wales) and the North of Europe (Finland, Iceland, and Norway). Authors representatives of these regions analyzed their national laws, curriculums, and physical activity recommendations based on specified questions, the answers to which are shown and summarized in Tables 1 (for Early Childhood Education) and 2 (for elementary school children). During the International Outdoor Movement Education Conference (December 3 to 5, 2020) organized by the Free University of Bozen,

several scholars presented their research results and good practices for children’s outdoor movement education. A round table discussion was organized by Arja Sääkslahti (University of Jyväskylä, Finland) on December 4, 2020 with the theme “Outdoor movement education in different ages of life: critical aspects, opportunities and proposals – toward a position statement”. Topics of the round table discussions were outdoor education in the contexts of physical activity, motor skills development, movement education, and physical education. Participants in the round table discussion were Professors: Andrea Ceciliani (University of Bologna, Italy), Arjo Federici (University of Urbino “Carlo Bo”, Italy), Boris Jidovtseff (University of Liège, Belgium), Francesco Sgrò, (University of Enna “Kore”, Italy), Ingunn Fjortoft (University of South-Eastern Norway, Norway), and Patrizia Tortella (Free University of Bozen, Italy). Each discussant described the local definition of outdoor movement education, underlined critical points to successful outdoor movement education in different age groups, and pointed out the educational meanings of outdoor movement education. Age groups were presented as 0-6-year-old children participating in kindergarten or Early Childhood Education (ECE), and 6-10-year-old elementary or primary school children. The congress presentations and the round table discussions, together with national document comparisons, create the data of this position statement.

**Results**

Comparison of national document from six regions revealed differences in the role of outdoor movement education and children’s possibilities for outdoor play (Tables 1 and 2).

**Early childhood education (ECE), Table 1.** Most children older than three years participate in ECE in the representative European countries. National laws regulating ECE mentioned physical activity in four countries (Belgium, Finland, Italy, and Iceland), and physical or physical education was mentioned in six countries. The ECE curriculum includes outdoor activities for outdoor movement education in all three Nordic countries and Wales. Outdoor education for academic learning was included in six ECE curriculums.

The structure of an ECE day differs greatly because there are remarkable differences between the amount of outdoor play that children can experience in kindergartens of different countries. Even if research-based data are missing, the Nordic ECE structure apparently allows 2 to 3 hours/day for outdoor play. In Belgium, children have 1 to 1.50 hours of outdoor play, and in Wales and Italy children should have daily outdoor play, but the amount of outdoor playing is not verified. There is no systematic data showing the distribution of the total amount of outdoor play between different countries. However, it is important to note that 80% of young Italian children do not play outdoors, while 29% children in Wales do not achieve recommended level of outdoor play. In the other countries, the total amount varies from 1 to 3 hours /day. There is a lack of knowledge about differences between the total amount of outdoor play during weekdays and weekends.

The importance of national physical activity recommendations seems to be recognized, because five countries have implemented national recommendations, while Belgium follows the WHO recommendations. In Finland and Wales, the role of outdoor play was recognized because their own documents mention outdoor play. ECE teachers implement ECE curriculum, and therefore it was surprising to realize that only Nordic countries are including outdoor activities in their ECE teacher educating programs (Table 1).

**Table 1.** Summary of the role of outdoor play in Early Childhood Education (ECE) in different regions of Europe

European region	South	Middle		North		
Country	Italy	Belgium (Wallonia)	Wales	Finland	Iceland	Norway
Number of children participating in ECE	28.6% (1-3yrs) 94.9% (3-6yrs)	48% (0-3yrs) 96.4 % (3-6yrs)	51% (0-4yrs)	74 % 1% (<1yr) 66% (2yrs) 89% (5 yrs)	87% 48% (1 yrs) 95-97% (2-5 yrs)	92 % 84% (1-2yrs) 97% (3-5 yrs)
ECE law mentions physical activity	YES	YES	NO (play mentioned)	YES	YES (physical development mentioned)	NO (implicit by play and development)
ECE curriculum mentions physical activity or physical education	YES	YES	YES	YES	YES	YES
ECE curriculum includes outdoor activities for outdoor movement education	YES	NO	YES (upcoming - no)	YES	YES	YES
ECE curriculum includes outdoor education for academic learning	YES	YES	YES	YES	YES	NO

Amount of outdoorplay in ECE daily program	From 30-60 min after lunch with good weather (no research data available)	Varying from 1-1.5hrs/day (no research data available)	All children (for 3-7yrs), private settings may not have (no research data available)	App. 2 hrs/day (no research data available)	Varies throughout the year, app. 2 hrs/day (no research data available)	Varies throughout the year, app. 3 hrs/day. (no research data available)
Overall amountof children's outdoorplay during weekdays	80% of children do not play outdoors. Not specified between weekday and weekends (no research data available)	Varying from 1-3 hrs/day (no research data available)	29% do not have recommended time outdoors. Not specified between weekdays and weekends	App. 3hrs/day	From 1-3 hrs/day (no research data available)	(no research data available)
Amount of outdoorplay during weekends	(Not specified between weekdays and weekends)	(no research data available)	(Not specified between weekdays and weekends)	App. 2 hrs/day	App. 1-3 hours/day (no research data available)	App. 1-3 hours/day (no research data available)
National physical activity recommendations for early years	YES	NO, following WHO recommendations	YES (outdoor play mentioned)	YES	YES	YES
ECE teacher education curriculums including outdoor activities	NO	NO (outdoor activities are included as one didactic method)	Mostly NO (variation between institutions)	YES	YES	YES

*NOTE:* References and documents for this table can be found in Appendix by country.

**Elementary school children, Table 2.** In European countries, obligatory schooling starts, at the latest, during the year when the child will have his or her seventh birthday, such as in Finland (Finnish Act of basic education 1998/628). Therefore, the participation rates are almost 100% in every country.

Physical activity is not recognized in every country, because laws do not mention physical activity in Belgium and Wales. Instead of physical activity, Belgium law states the importance of physical education, while Wales mentions play as relevant content in elementary school.

When comparing national curriculums, the importance of physical education is recognized, because all countries mention physical education. However, minor differences can be recognized in the number of weekly physical education lessons. Moreover, it is important to note that the paradigm behind physical education differs, because the main contents of physical education are different: Italian and Belgian perspectives (see Table 1 and 2) focus on the psychomotor aspects more than, for example, in Nordic countries, where the importance of physical activity is mentioned as one of the main physical education learning outcomes.

Curriculums mention outdoor activities as an environment for movement education in five countries; only the Belgian curriculum was an exception. Even though the outdoor environment was recognized as an appropriate learning environment for movement education, only Nordic countries mention outdoor education to support academic learning. The structure of schooldays seems to differ, perhaps based on children's age, but also in the means of school breaks. It seems to be very Nordic structure to have several short (app. 15 minutes) outdoor breaks after each lesson. A more typical structure, in other parts of Europe, may be to have one or two longer outdoor breaks, during or after the lunch break. Interestingly, this comparison showed that there is no systematic data from these countries showing the total amount of outdoor breaks. Therefore, there is also lack of knowledge about how much each child plays outdoors during weekdays. Italy is the only country with having the data showing that approximately a third of children plays outdoors 5 to 7 days/week. With this gap, it is not surprising that none of the countries have the data showing how much children spend playing outdoors during weekends. Fortunately, there is one positive sign: five countries have their own national physical activity recommendations for school-aged children, while Belgium follows the international WHO recommendations. Wales and Finland mention outdoor activities as an example of appropriate physical activities.

Recommendations are guiding official documents and adults' behavior. Therefore, some changes could be expected in the coming years. The change typically begins with teachers. This is why the role of teacher education programmes is crucial. Unfortunately, all teacher education programmes do not include outdoor movement education or contents including outdoor activities as successful didactic tools to teach and support children's overall development (Table 2).

**Table 2.** Summary of the role of outdoor play in elementary/primary schools (children 6-10 years of age) in different regions of Europe

European region	South	Middle		North		
Country	Italy	Belgium (Wallonia)	Wales	Finland	Iceland	Norway
Number of children participating elementary school	100%	98.2%	99.62%	100%	100%	100%
Elementary school education law mentions physical activity	YES	YES (Physical education mentioned)	NO (Play mentioned)	YES	YES	YES
Elementary school curriculum mentions physical activity or physical education	YES PE x 2 hrs/week	YES PE 2 hrs/week	YES PE x 2 hrs/week	YES PE 2-3 hrs/week	YES PE 3 hrs/ week	YES PE x 2 hrs/week
Curriculum includes outdoor activities for outdoor movement education	YES	NO	YES	YES	YES	YES
Curriculum includes outdoor education for academic learning	NO	NO	NO	YES	YES	YES
Amount of outdoor play in daily school program (such as outdoor breaks)	From 30-60 min, with good weather  <i>(no research data available)</i>	From 1-1.50hrs/day  <i>(no research data available)</i>	Varies from school to school  <i>(no research data available)</i>	Varies daily: 15 minutes outdoor break during every 45-60 min. lesson (from 45-75 min/day) based on school breaks  <i>(no research data available)</i>	Varies daily: 15 minutes outdoor break during every 45-60 min. From 60+ min/day  <i>(no research data available)</i>	Varies daily: 15 minutes outdoor break during every 45-60 min. lesson (from 45-75 min/day) based on school breaks  <i>(no research data available)</i>
Overall number of children's outdoor play during weekdays	App. 32% 5-7 days/week Outdoor activities and optional duration <i>(no research data available)</i>	Varying from 1-3 hrs/day  <i>(no research data available)</i>	  <i>(no research data available)</i>	Varying from 45 min. up to several hours  <i>(no research data available)</i>	Varying from 45 min. up to several hours  <i>(no research data available)</i>	  <i>(no research data available)</i>
Amount of outdoor play during weekends	<i>(no research data available)</i>	<i>(no research data available)</i>	<i>(no research data available)</i>	<i>(no research data available)</i>	<i>(no research data available)</i>	<i>(no research data available)</i>
National physical activity recommendations for 6-10 years-old	YES	NO, Following WHO recommendations	YES (outdoor activities not mentioned)	YES (outdoor activities as practical PA examples)	YES	YES
Teacher education programmes include outdoor activities	YES	NO (outdoor activities are used as one didactic method)	VARIATION between institutions -needs has recognized	YES	YES (Physical education teachers teach physical education and swimming)	YES

NOTE: References and documents for this table can be found in Appendix by country.

## Discussion and Conclusion

It is important to note that the definition of outdoor play is not clear-cut in terms of activity performed. Specifically, it is not clearly defined whether the term should refer to “the child being outside”, “the child playing outside” or whether the “child is performing physical activity outside”. As the differences between the possible definitions are substantial and the definition will impact health and cognitive and motor development, we propose to use the term “outside movement” instead of “outside play” when referring to education/events aimed at promoting physical activity-induced benefits for child development.

## Conclusion

The information obtained by the questionnaire and the analysis of the data presented at the Congress indicate a need for future recommendations that we list in this position statement:

### 1- Definition

There is a need for a clear-cut definition of outside activities. An evidence-informed position statement (Tremblay, 2015) on active outdoor play for children aged 3–12 years was produced by a diverse, cross-sectorial group of partners, stakeholders, and researchers of Canada in 2016 and reflects the general understanding of that term. “Active Outdoor Play” is sometimes referred to as “active free-play” or “self-directed play” and is defined as “unstructured physical activity” that takes place outdoors in the child’s free time. Children’s active play behavior is meant to be a “fun, unstructured, and freely chosen form of physical activity” (Truelove et al., 2016). On the other hand, structured physical activity is also part of the child’s daily time, especially in schools or educational environments. Thus, especially when referring to a child’s activities that are followed/monitored/organized by adults, a more comprehensive terminology should be used. We propose the term “movement education” as the ensemble of initiatives proposed/organized by the adult with the goal of fostering motor development and/or to maintain children’s physical activity. The adult’s role is to understand how a child’s individual characteristics may interact with the outdoor environment and recognize the needs of each child (Niemistö et al., 2020). The term “outside” refers to the educational process being carried out outside (in open air, including natural environments).

- The term Outdoor Movement Education points to the role of education in physical activity and in the holistic development of the child in an outdoor environment.

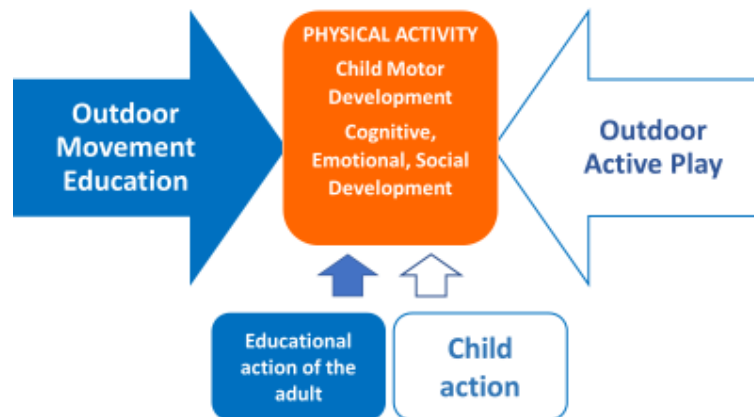


Figure 1 Outdoor Movement Education and Outdoor Active Play

- When we say, "Outdoor Movement Education", we mean the educational activity of the adult in planning structured, semi-structured or self-directed child motor education. In this case, we focus the attention on the pedagogical and educational role of the adult who has the responsibility to create opportunities for motor and physical activity of children to promote the development of motor skills and cognitive, social, relational, and affective development of the child.
- The educational action of the adult always includes methodological, didactic choices and the physical environment and materials where the educational action will be carried out. Even in the case of “active play” (i.e., “active free-play” or “self-directed play”), the choice of the play environment is usually done by the adult, and it is an important educational moment because affordances linked to the specific environment may or may not contribute to activating the child at a motor level.

### 2- Action

To foster the concept and the perceived value of “Outdoor movement education” the following actions must be pursued:

- Parents and caregivers need knowledge about and practical examples of the importance of physically active outdoor play. Appropriate information motivates parents to support their child's development through outdoor activities.
- Organize Outdoor Movement Education trainings for teachers and educators of children ages 0-6 years, targeting: a) observation of the environment and materials for the recognition of affordances; b) study of methodologies of structured activities and free play; c) study of children's motor development and basic motor skills; d) outdoor clothing guidelines.
- The presence of safe playgrounds, parks and school yards near homes, ECE centres and schools should be considered in urban planning and included as a relevant item when measuring the quality of life of a city/town.
- Outdoor movement moments/events should be part of ECE and elementary school structure. This way, outdoor play is possible for every child in a daily basis.
- Outdoor Movement Education needs to be supported by national regulations. Laws and national curriculums regulating ECE and obligatory schooling. This will open the door to the use of the outdoor to the use of the outdoors as an important learning environment for other educational goals.
- Outdoor movement-based play is the most important way to implement physical activity recommendations. National physical activity recommendations can support the implementation in a culturally accepted manner.
- Teacher education study programmes need to include outdoor activities as a didactic method to support academic learning and physical activity in nature as a method promoting holistic development. Holistic development means supporting physical, cognitive, socio-emotional, ethical, spiritual, etc. growth and development. Outdoor Movement Education is important for children's motor skill development, with expected impact on several other domains of the human person. In this sense, it can promote children's participation in structured sport activities beyond school time.
- More research is needed to verify the amount of children's outdoor movement at home, in ECE, and in school environments in different cultures. Longitudinal intervention studies are needed to measure and confirm the positive associations between Outdoor Movement Education and children's development.

### Acknowledgements

The preparation of this *Position Statement* was made possible through funding from the A.S.D. Laboratorio 0246 of Treviso, Italy, who financed the publication, from the Free University of Bolzano, who financed the congress "Outdoor Education: research and practice", S.I.E.M.e.S. the Italian Society of Movement and Sport Education, the CRSMI Center for Research in Child Motor Development of the University of Verona that both contributed in the organization of the congress, of the special Issue and of the position statement.

### Author Contributions

Patrizia Tortella, Guido Fumagalli, Mario Lipoma, Francesco Sgrò, Andrea Ceciliani, Boris Jidovtseff, Nalda Wainwright, Ingunn Fjortoft, Hermundur Sigmundsson, Monika Haga, Arja Sääkslahti served as the Steering Committee for the development of the *Position Statement*.

Patrizia Tortella, Guido Fumagalli, Mario Lipoma conceived the project.

Patrizia Tortella, Francesco Sgrò, Andrea Ceciliani, Boris Jidovtseff, Ingunn Fjortoft, Hermundur Sigmundsson, Monika Haga, Ario Federici, Arja Sääkslahti provided critical input to the roundtable for the preparation of the position statement.

Arja Sääkslahti orchestrated the development and writing of the *Position Statement*.

Patrizia Tortella, Guido Fumagalli, Mario Lipoma, Francesco Sgrò, Andrea Ceciliani, Boris Jidovtseff, Nalda Wainwright, Ingunn Fjortoft, Hermundur Sigmundsson, Monika Haga, Arja Sääkslahti researched, analyzed and provided the documents related to primary and preschool organization and wrote the manuscript.

All authors participated in the *Position Statement*, contributed expertise and content to the position statement, revised the paper critically for important intellectual content, and provided final approval of the version to be published.

### Conflicts of Interest

The authors declare no conflict of interest.

### REFERENCES

- Anderson, R.M., Heesterbeek, H., Klinkenberg, D. & Hollingsworth, T.D. (2020). How will country-based mitigation measures influence the course of the COVID-19 epidemic? *Lancet*, 395(10228), 931-934. [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)30567-5/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30567-5/fulltext)
- Aronsson J., Waite S., & Clark, M. (2015). Measuring the impact of outdoor learning on the physical activity of school age children: The use of accelerometry. *Education and Health*, 33(3), 57-62.

- Bates, L.C., Zieff, G., Stanford, K., Moore, J.B., Kerr, Z.Y., Hanson, E.D., Gibbs, B.B., Kline, C.E., & Stoner, B.L. (2020). COVID-19 Impact on behaviors across the 24-hour day in children and adolescents: Physical Activity, Sedentary Behavior, and Sleep. *Children*, 7(9), 138; <https://doi.org/10.3390/children7090138>
- Cachón-Zagalaz J., Sánchez-Zafra, M., Sanabrias-Moreno, D., González-Valero, G., Lara-Sánchez, A.J., & Zagalaz-Sánchez, M.L. (2020). Systematic review of the literature about the effects of the COVID-19 pandemic on the lives of school children. *Frontiers of Psychology*, 14(11), 569348. doi: 10.3389/fpsyg.2020.569348.
- Finnish Ministry of Education and Culture, (2016). Recommendations for physical activity in early childhood 2016. Joy, play, and doing together. Ministry of Education and Culture 2016:35.
- Fjørtoft, I. (2001). The natural environment as a playground for children: The impact of outdoor play activities in pre-primary schoolchildren. *Early Childhood Education Journal*, 29(2), 111-118.
- Guidelines on physical activity, sedentary behaviour and sleep for children under 5 years of age. (2019). Geneva: World Health Organization. Licence: CC BY-NC-SA 3.0 IG <https://apps.who.int/iris/bitstream/handle/10665/311664/9789241550536-eng.pdf?sequence=1&isAllowed=y>
- Haig-Ferguson, A., Cooper, K., Cartwright, E., Loades, M., & Daniels, J. (2020). Practitioner review: Health anxiety in children and young people in the context of the COVID-19 pandemic. *Behavioural and Cognitive Psychotherapy*, 1-15. doi:10.1017/S1352465820000636
- Husti, K.M., Normand, M.P., Larson, T.A., & Morley, A.J. (2012). The effect of outdoor activity context on physical activity in preschool children. *Journal of Applied Behavior Analysis*, 45, 401-405. doi.org/10.1177/0145445514543466
- Impact of National Containment Measures on Decelerating the Increase in Daily New Cases of COVID-19 in 54 Countries and 4 Epicenters of the Pandemic: Comparative Observational Study, (2020). *Journal of Medical Internet Research*, 22(7), e19904. doi: 10.2196/19904
- Kimm, S.Y.S., & Obarzanek, E. (2002). Childhood obesity: A new pandemic of the new millennium. *Pediatrics*, 110(5), 1003-1007. doi: <https://doi.org/10.1542/peds.110.5.1003>
- King, H.J., Burke, L.M., Halson, S.L., & Hawley, J.A. (2020). The challenge of maintaining metabolic health during a global pandemic. *Sports Medicine*, 50, 1233-1241. doi.org/10.1007/s40279-020-01295-8
- Kraemer, M.U., Yang, C.-H., Gutierrez, B., Wu, C.-H., Klein, B., Pigott, D.M. et al (2020). The effect of human mobility and control measures on the COVID-19 epidemic in China. *Science* 368(6490):493-497. doi.org/10.1126/science.abb4218
- Lee, J. (2020). Mental health effects of school closures during COVID-19. *Lancet. Child & Adolescent Health*, 4(6):421. doi: 10.1016/S2352-4642(20)30109-7.
- Liu J.J., Bao Y., Huang X., Shi J., Lu L. (2020). Mental health considerations for children quarantined because of COVID-19. *Lancet Child & Adolescent Health*, 4(5), 347-349. doi: 10.1016/S2352-4642(20)30096-1
- Ng, M., Fleming, T., Robinson, M., Thomson, B., Graetz, N., Margono, C., Mullany, E.C., Biryukov, S., Abbafati, C., Abera S.F., et al. (2014). Global, regional, and national prevalence of overweight and obesity in children and adults during 1980-2013: A systematic analysis for the Global Burden of Disease Study 2013. *Lancet*, 384, 766-781.
- Nicaise, V., Kahan, D., & Sallis, J.F. (2011). Correlates of moderate-to-vigorous physical activity among preschoolers during unstructured outdoor play periods. [Preventive Medicine](#), 53(4-5), 309-315. doi.org/10.1016/j.ypmed.2011.08.018
- Niemistö, D., Finni, T., Cantell, M., Korhonen, E., & Sääkslahti, A. (2020). Individual, family, and environmental correlates of motor competence in young children: Regression model analysis of data obtained from two motor tests. *International Journal of Environmental Research and Public Health*, 17 (7), 2548. doi: 10.3390/ijerph17072548
- Singh, S., Roy, D., Sinha, K., Parveen, S., Sharma, G., & Joshi, G. (2020). Impact of COVID-19 and lockdown on mental health of children and adolescents: A narrative review with recommendations. *Psychiatry Research*, 293, 113429.
- [Sunhee Park](#), R.N., [Beomsoo, K.](#), & [Lee, J.](#) (2020). Social distancing and outdoor physical activity during the COVID-19 outbreak in South Korea: Implications for physical distancing strategies. *Asia Pacific Journal of Public Health*, 32(6-7), 360-362. doi.org/10.1177/1010539520940929.
- Tortella, P., Haga, M., Ingebrigtsen, J.E., Fumagalli, G.F., and Sigmundsson, H., (2019). Comparing Free Play and Partly Structured Play in 4-5-Years-Old Children in an Outdoor Playground. *Frontiers of Public Health*, 7, 197. doi: 10.3389/fpubh.2019.00197 <https://doi.org/10.3389/fpubh.2019.00197>.
- Tremblay, M.S., Gray, C., Babcock, H., Barnes, J., Costas Bradstreet, C., Carr, D., Chabot, G., Choquette L., Chorney, D., Collyer, C., Herrington, S., Janson, K., Janssen, J., Larouche, R., Pickett, W., Power, M., Sandseter, E.B., Simon, B., & Brussoni, M. (2015). Review. Position Statement on Active Outdoor Play. *International Journal of Environmental Research and Public Health*, 12, 6475-6505. doi:10.3390/ijerph120606475.
- Tremblay, M.S., Onywera, V., & Adamo, K.B. (2010). A child's right to healthy active living—Building capacity in Sub-Saharan Africa to curb the impending physical activity transition: The KIDSCAN Research



- Alliance. In 20th Anniversary of the Convention on the Rights of the Child; Bennett, S., Pare, M., (Eds.), University of Ottawa Press: Ottawa, Canada, 2010.
- Truelove, S., Vanderloo, L.M. and Tucker, P. (2016) 'Defining and measuring active play among young children: A systematic review', *Journal of Physical Activity and Health*, 14(2), 155-166.
- W.H.O., (2019). Guidelines on physical activity, sedentary behavior and sleep for children under 5 years of age. <https://www.who.int/publications/i/item/9789241550536>
- W.H.O., (2020). WHO Guidelines on physical activity and sedentary behavior: web annex evidence profiles <https://www.who.int/publications/i/item/9789240015111>
- W.H.O., Noncommunicable diseases and their risk factors. <https://www.who.int/ncds/prevention/physical-activity/introduction/en/>
- W.H.O., (2008). Global recommendations on physical activity for health <https://www.who.int/publications/i/item/9789241599979>
- Wong, C.K.H., Wong, J.Y.H., Tang, E.H.M., Au, C.H., Lau, K.T.K., & Wai, A.K.C. (2020). Impact of national containment measures on decelerating the increase in daily new cases of COVID-19 in 54 Countries and 4 epicenters of the Pandemic: comparative observational study. *Journal of Medical Internet Research*, 22(7), e19904. DOI: 10.2196/19904.
- Zhai, Y. & Du, X. (2020). Mental health care for international Chinese students affected by the COVID-19 outbreak. *Lancet Psychiatry*, 7(4): e22. doi: 10.1016/S2215-0366(20)30089-4.

## Appendix 1

References for Table 1 and Table 2

### Belgium

Table 1: ECE

0-3YO children:

[https://www.one.be/fileadmin/user\\_upload/siteone/PRESENTATION/Rapports\\_d\\_activite/2017/rapport\\_activite\\_2017\\_chiffres.pdf](https://www.one.be/fileadmin/user_upload/siteone/PRESENTATION/Rapports_d_activite/2017/rapport_activite_2017_chiffres.pdf)

3-6YO children: Unescodatabase: <http://uis.unesco.org/fr/country/be>

3-6YO children: [https://www.galilex.cfwb.be/document/pdf/22229\\_041.pdf](https://www.galilex.cfwb.be/document/pdf/22229_041.pdf)

3-6YO children: <http://www.enseignement.be/index.php?page=28316&navi=4694>

Legal schedule obligation in preschool and primary school:

[https://www.galilex.cfwb.be/document/pdf/25078\\_000.pdf](https://www.galilex.cfwb.be/document/pdf/25078_000.pdf)

Outdoor play in 0-3YO childcarecenter:

[https://www.one.be/fileadmin/user\\_upload/siteone/PRO/Recherches/Rapport-recherche-IEE.pdf](https://www.one.be/fileadmin/user_upload/siteone/PRO/Recherches/Rapport-recherche-IEE.pdf)

Content to be developed during preschool teacher education:

[https://www.galilex.cfwb.be/document/pdf/25501\\_005.pdf](https://www.galilex.cfwb.be/document/pdf/25501_005.pdf)

[https://www.galilex.cfwb.be/document/pdf/26112\\_000.pdf](https://www.galilex.cfwb.be/document/pdf/26112_000.pdf)

Table 2: Elementary school

6-10 YO children, Unescodatabase: <http://uis.unesco.org/fr/country/be>

[https://www.galilex.cfwb.be/document/pdf/22229\\_041.pdf](https://www.galilex.cfwb.be/document/pdf/22229_041.pdf)

Competence bases for primary education in French community of Belgium:

<http://www.enseignement.be/index.php?page=24737&navi=295>

Legal schedule obligation in preschool and primary school:

[https://www.galilex.cfwb.be/document/pdf/25078\\_000.pdf](https://www.galilex.cfwb.be/document/pdf/25078_000.pdf)

Content to be developed during primary school teacher education:

[https://www.galilex.cfwb.be/document/pdf/25501\\_005.pdf](https://www.galilex.cfwb.be/document/pdf/25501_005.pdf)

[https://www.galilex.cfwb.be/document/pdf/26112\\_000.pdf](https://www.galilex.cfwb.be/document/pdf/26112_000.pdf)

### Finland

Table 1: ECE

(THL: Varhaiskasvatus 2018, Tilastoraportti 32/2019) : <https://thl.fi/fi/tilastot-ja-data/tilastot-aiheittain/lapset-nuoret-ja-perheet/varhaiskasvatus/lasten-paivahoito>

Varhaiskasvatuslaki 540/2018 [Children's Daycare Act 540/2018]:

<https://www.finlex.fi/fi/laki/alkup/2018/20180540>

Varhaiskasvatussuunnitelmanperusteet 2018[National core curriculum for early childhood education and care 2018]

[https://www.oph.fi/sites/default/files/documents/varhaiskasvatussuunnitelman\\_perusteet.pdf](https://www.oph.fi/sites/default/files/documents/varhaiskasvatussuunnitelman_perusteet.pdf)

Joy, play and doing together; recommendations for physical activity in early childhood. 2016.

<https://julkaisut.valtioneuvosto.fi/handle/10024/78924>

Finland's physical activity report card 2018

<https://www.likes.fi/wp-content/uploads/2020/03/2800-Finland-reportcard2018-final-150.pdf>

IISAAr – Finland study 2019, unpublished data

Soini et al. , unpublished manuscript

Table 2: Elementary school

Act of basic education 1998/628 (Perusopetuslaki 21.8.1998/628):

<https://www.finlex.fi/fi/laki/ajantasa/1998/19980628>

National Core Curriculum for basic education 2014 (Perusopetuksen opetussuunnitelmaperusteet 2014)

[https://www.oph.fi/sites/default/files/documents/perusopetuksen\\_opetussuunnitelman\\_perusteet\\_2014.pdf](https://www.oph.fi/sites/default/files/documents/perusopetuksen_opetussuunnitelman_perusteet_2014.pdf)

Finland's physical activity report card 2018: <https://www.likes.fi/wp-content/uploads/2020/03/2800-Finland-reportcard2018-final-150.pdf>

Physical activity recommendation for school aged children (7 to 18-years), to be updated 3/2021

Separate curriculums of each university. Example from the University of Jyväskylä:

<https://www.jyu.fi/edupsy/fi/laitokset/okl/opiskelu/luokanopettajakoulutus/opetussuunnitelmat-ja-opetusohjelmat>

**Island**

Table 1: ECE

Hagstofa Íslands: <https://hagstofa.is/utgafur/frettasafn/menntun/born-og-starfsfolk-i-leikskolum-2018/>

Lög um leikskóla: <https://www.althingi.is/lagas/nuna/2008090.html>

Adalnámskrá leikskóla 2011: [https://www.stjornarradid.is/media/menntamalaraduneyti-media/media/forsidumyndir/lokadrog-leiksk\\_vefur.pdf](https://www.stjornarradid.is/media/menntamalaraduneyti-media/media/forsidumyndir/lokadrog-leiksk_vefur.pdf)

Landlæknir: <https://www.landlaeknir.is/heilsa-og-lidan/hreyfing/born-a-leikskolaaldri/>

[https://www.hi.is/kennaradeild/um\\_leikskolakennaranam](https://www.hi.is/kennaradeild/um_leikskolakennaranam)

Table 2: Elementary school

<https://www.althingi.is/lagas/nuna/2008091.html>

<https://www.stjornarradid.is/lisalib/getfile.aspx?itemid=f7d55056-989c-11e7-941c-005056bc4d74>

<https://www.landlaeknir.is/heilsa-og-lidan/hreyfing/born/>

[https://www.hi.is/deild\\_kennslu\\_og\\_menntunarfraedi](https://www.hi.is/deild_kennslu_og_menntunarfraedi)

**Italy**

Table 1. ECE

Istat – Istituto Nazionale di statistica

<https://www.istat.it/it/archivio/236666>

Istat – Istituto Nazionale di statistica

<https://www.istat.it/it/files/2019/12/2.pdf>

Italian Ministry of Health recommendations (April 30, 2019)

[http://www.salute.gov.it/portale/news/p3\\_2\\_1\\_1\\_1.jsp?lingua=italiano&menu=notizie&p=dalministro&id=3728](http://www.salute.gov.it/portale/news/p3_2_1_1_1.jsp?lingua=italiano&menu=notizie&p=dalministro&id=3728)

Italian Ministry of Health (May 30, 2019)

[http://www.salute.gov.it/imgs/C\\_17\\_EventiStampa\\_551\\_intervisteRelatori\\_itemInterviste\\_1\\_fileAllegatoIntervista.pdf](http://www.salute.gov.it/imgs/C_17_EventiStampa_551_intervisteRelatori_itemInterviste_1_fileAllegatoIntervista.pdf)

EPICENTRO: L'epidemiologia per la sanità pubblica – Italian Ministry of Health (March 19, 2020). "Con i bambini l'attività fisica... è un gioco!" (0-11 years old children)

<https://www.epicentro.iss.it/coronavirus/sars-cov-2-stili-vita-attivita-fisica-0-11-anni>

Servizi Educativi da 0 a 3 anni. ISPESL Istituto Superiore per la prevenzione e la sicurezza sul lavoro- Institute for Prevention and Safety at Work (December 2005).

[http://www.salute.gov.it/imgs/C\\_17\\_opuscoliPoster\\_159\\_ulterioriallegati\\_ulterioreallegato\\_0\\_alleg.pdf](http://www.salute.gov.it/imgs/C_17_opuscoliPoster_159_ulterioriallegati_ulterioreallegato_0_alleg.pdf)

Indicazioni Nazionali del Curricolo per la Scuola dell'Infanzia (2012)

<http://www.indicazioninazionali.it/wp-content/uploads/2018/08/decreto-ministeriale-254-del-16-novembre-2012-indicazioni-nazionali-curricolo-scuola-infanzia-e-primo-ciclo.pdf>

Some local private childcare centers organize outdoor education

<http://www.informainfanzia.net/outdoor-education/>

ISTAT report 2011 – infanzia e vita quotidiana <https://www.istat.it/it/files/2011/11/report-infanzia-2011.pdf>

Informa Salus 2019 <http://www.informasalus.it/it/articoli/bambini-tempo-libero.php>

Ministero della salute (29/05/2017)

[http://www.salute.gov.it/imgs/C\\_17\\_pubblicazioni\\_2828\\_allegato.pdf](http://www.salute.gov.it/imgs/C_17_pubblicazioni_2828_allegato.pdf)

Ministero della salute 3-5 Yearsold

*Bambini, le linee guida Oms su attività fisica, comportamento sedentario e sonno (30/04/2019)*

[http://www.salute.gov.it/portale/news/p3\\_2\\_1\\_1\\_1.jsp?lingua=italiano&menu=notizie&p=dalministro&id=3728](http://www.salute.gov.it/portale/news/p3_2_1_1_1.jsp?lingua=italiano&menu=notizie&p=dalministro&id=3728)

Table 2: Elementary school

Statistics of the amount pupils in

schools: <https://www.miur.gov.it/documents/20182/0/Principali+dati+della+scuola+-+avvio+anno+scolastico+2018-2019.pdf/fb3e7b10-e2bc-49aa-a114-c41ef53cac9?version=1.0>

Statistics of the amount of disabled pupils in schools:



<https://hwb.gov.wales/curriculum-for-wales>

<https://hwb.gov.wales/curriculum-for-wales-2008/foundation-phase/physical-development>

Updated framework:

<https://hwb.gov.wales/api/storage/d5d8e39c-b534-40cb-a3f5-7e2e126d8077/foundation-phase-framework.pdf>

<https://hwb.gov.wales/api/storage/fcb8539c-9be7-4883-8542-35d7b54b56f2/foundation-phase-outdoor-learning-handbook.pdf>

New curriculum

<https://hwb.gov.wales/curriculum-for-wales>

<https://hwb.gov.wales/api/storage/d5d8e39c-b534-40cb-a3f5-7e2e126d8077/foundation-phase-frame>

<https://www.wales.nhs.uk/news/45907>

<https://www.sport.wales/files/f16771b9041ecbd847704e346c9e15bc.pdf> (section 5 – sport and outdoor environment)

[https://gov.wales/sites/default/files/statistics-and-research/2019-03/national-survey-for-wales-2017-18-child-lifestyles-diet-and-physical-activity-897\\_1.pdf](https://gov.wales/sites/default/files/statistics-and-research/2019-03/national-survey-for-wales-2017-18-child-lifestyles-diet-and-physical-activity-897_1.pdf)

<https://www.wales.nhs.uk/news/45907>

<https://everychildwales.co.uk>

**Physical activity guidelines: UK Chief Medical Officers' report**

<https://www.gov.uk/government/publications/physical-activity-guidelines-uk-chief-medical-officers-report>

<https://senedd.wales/laid%20documents/cr-ld12369/cr-ld12369-e.pdf>

Table 2: Elementary school:

<https://gov.wales/sites/default/files/statistics-and-research/2019-07/pupils-educated-other-school-september-2018-august-2019-644.pdf>

This page gives a total number of children in nursery, primary, middle school and secondary school.

<https://statswales.gov.wales/Catalogue/Education-and-Skills/Schools-and-Teachers/Schools-Census/Pupil-Level-Annual-School-Census/Pupils/pupilsresentcensusday-by-localauthorityregion-sector>

<http://www.legislation.gov.uk/mwa/2010/1/contents>

More information: <https://www.playwales.org.uk/eng/sufficiency>

Links to research:

<https://www.playwales.org.uk/eng/research>

The content included here is also applicable to 0 – 6yrs as the Foundation Phase spans from 3 to 7yrs old.

<https://hwb.gov.wales/curriculum-for-wales-2008/foundation-phase/physical-development>

This is for children aged 7-11

<https://hwb.gov.wales/api/storage/7b01cf26-9974-4c3d-bb1f-ee79e111b448/physical-education-inthe-national-curriculum.pdf>

<https://senedd.wales/laid%20documents/cr-ld12369/cr-ld12369-e.pdf>

The content included here is also applicable to 0 – 6yrs as the Foundation Phase spans from 3 to 7yrs old

<https://hwb.gov.wales/api/storage/fcb8539c-9be7-4883-8542-35d7b54b56f2/foundation-phase-outdoor-learning-handbook.pdf>

The content included here is for pupils aged 7-11 years

<https://hwb.gov.wales/api/storage/7b01cf26-9974-4c3d-bb1f-ee79e111b448/physical-education-inthe-national-curriculum.pdf>

Estyn (2019) *Healthy and happy – school impact on pupils' health and wellbeing*. Cardiff: Crown Copyright

<https://www.estyn.gov.wales/thematic-report/healthy-and-happy-school-impact-pupils-health-and-wellbeing>

Physical activity of children and young people (2019)

<https://senedd.wales/laid%20documents/cr-ld12369/cr-ld12369-e.pdf>

Active Healthy Kids Report Card 2018: <https://business.senedd.wales/documents/s76223/Paper%204%20-%20Active%20Healthy%20Kids%20Wales%202018%20Report.pdf>

'I learn new things and climb trees' – *What children say about play in Wales* report

<https://www.playwales.org.uk/login/uploaded/publications/PSA%20children's%20report%20.pdf>

<https://www.sport.wales/files/be75d2ef7a9f0620a5bc371ba9c9ce.pdf>

Active Healthy Kids Report Card 2018: <https://business.senedd.wales/documents/s76223/Paper%204%20-%20Active%20Healthy%20Kids%20Wales%202018%20Report.pdf>

'I learn new things and climb trees' – *What children say about play in Wales* report

<https://www.playwales.org.uk/login/uploaded/publications/PSA%20children's%20report%20.pdf>

**Physical activity guidelines: UK Chief Medical Officers' report**

<https://www.gov.uk/government/publications/physical-activity-guidelines-uk-chief-medical-officers-report>

Physical activity of children and young people (2019)

<https://senedd.wales/laid%20documents/cr-ld12369/cr-ld12369-e.pdf>