

Amsterdam University of Applied Sciences

Just Dance? Teachers Perspectives on Implementing a Daily Classroom Physical Activity Break

Janssen, Mirka; van den Berg, Vera ; de Groot, Annerose ; Singh, Amika

DOI

[10.1249/TJX.0000000000000128](https://doi.org/10.1249/TJX.0000000000000128)

Publication date

2020

Document Version

Final published version

Published in

Translational Journal of the ACSM

License

CC BY-NC-ND

[Link to publication](#)

Citation for published version (APA):

Janssen, M., van den Berg, V., de Groot, A., & Singh, A. (2020). Just Dance? Teachers Perspectives on Implementing a Daily Classroom Physical Activity Break. *Translational Journal of the ACSM*, 5(11), 1-9. <https://doi.org/10.1249/TJX.0000000000000128>

General rights

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please contact the library:

<https://www.amsterdamuas.com/library/contact/questions>, or send a letter to: University Library (Library of the University of Amsterdam and Amsterdam University of Applied Sciences), Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

OPEN

Just Dance? Teachers Perspectives on Implementing a Daily Classroom Physical Activity Break

Mirka Janssen,¹ Vera van den Berg,² Annerose de Groot,³ and Amika Singh²

ABSTRACT

A regular short physical activity break in the classroom may improve classroom behavior. The current study reports on the results of the implementation of a daily 10-min Just Dance break in the classroom. A total of 31 Dutch primary school teachers agreed to participate in the study. We collected data on the frequency of the use of the Just Dance breaks via an online registration system. Data on the long-term barriers and facilitators of the implementation were collected using two online questionnaires. In addition, we held five interviews with teachers to elucidate data on barriers and facilitators. The results show that none of the teachers maintained the Just Dance breaks on a daily basis, and only 19% ($n = 6$) of the teachers on a weekly basis (i.e., one to three times a week). According to all participating teachers, a lack of time was the primary barrier to implement Just Dance breaks on a daily basis. Teachers who did not maintain Just Dance breaks on a weekly basis also experienced difficulties in 1) keeping all pupils engaged during the full 10-min Just Dance break or 2) getting the pupils focused again after the Just Dance break. Teachers who maintained the Just Dance breaks on a weekly basis provided several practical recommendations for a more sustainable implementation process. This study shows that the implementation process of daily Just Dance breaks is challenging. We recommend providing teachers with professional support when implementing physical activity breaks in their daily program.

INTRODUCTION

Children spend a substantial amount of their day at school. Therefore, the implementation of physical activity (PA) programs implemented in the school setting may have a potentially large impact on children achieving the PA recommendations. However, it has been shown that primary school children spend more than 60% of the time at school being sedentary (1,2) and only 5% on moderate- to vigorous-intensity activities (2). These numbers illustrate that the traditional school setting contributes to the secular trend children's declining levels of PA by fostering physical inactivity during the school day. Parent-reported data show that only half of the 4- to 11-yr-old Dutch children meet the health-based PA recommendations of 60 min moderate- to vigorous-intensity PA per day (3). Accelerometer-based data suggest that these percentages are actually

much lower among 10- to 12-yr-old boys and girls (3), indicating the need for interventions successfully promoting PA among this age-group.

Regular moderate- to vigorous-intensity PA bouts during the school day may not only contribute to health but also benefit children's concentration (4). There is some evidence that acute short (i.e., 10 min) bouts of moderate- to vigorous-intensity PA can have beneficial effects on cognitive performance (4–6). The effects of these acute bouts of PA are promising, although evidence for the long-term effects of PA on children's cognitive performance is inconclusive (7,8). In addition, participation in classroom PA breaks may enhance children's on-task behavior (9). To gain better insight into the effects of short exercise breaks performed on a regular basis on cognitive performance, we conducted a randomized controlled trial (RCT), which was published in 2019 as part of the SMART MOVES! project (10). The aim of the RCT was to evaluate the effectiveness of daily 10-min moderate- to vigorous-intensity PA breaks on cognitive performance of 9- to 12-yr-old children.

In the current study, we evaluate the implementation process of the intervention in the classroom because it is likely that

¹ Faculty of Sports and Nutrition, Center of Expertise Urban Vitality, Amsterdam University of Applied Sciences, Dokter Meurerlaan 8, 1067 SM Amsterdam, THE NETHERLANDS; and ² Amsterdam UMC, Vrije Universiteit Amsterdam, Department of Public and Occupational Health, Amsterdam Public Health Research Institute, Van der Boerhorststraat 7, NL 1081 BT Amsterdam, THE NETHERLANDS; and ³ Het ABC, Organisation of educational advisors, Amsterdam, THE NETHERLANDS

Address for correspondence: Mirka Janssen, Ph.D., Faculty of Sports and Nutrition, Center of Expertise Urban Vitality, Amsterdam University of Applied Sciences, Dokter Meurerlaan 8, 1067 SM Amsterdam, The Netherlands (E-mail: m.janssen@hva.nl).

2379-2868/0511/e000128

Translational Journal of the ACSM

Copyright © 2020 The Author(s). Published by Wolters Kluwer Health, Inc. on behalf of the American College of Sports Medicine. This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

highly motivated schools and teachers (i.e., selection bias) were overrepresented in the RCT. Not only do teachers agree to adapt their daily routine, they also accept the burden of assessments that comes along with participation in a study. Therefore, the number of performed PA breaks performed could have been higher under these randomized circumstances. Consequently, it is difficult to conclude about the true feasibility of the implementation of a daily PA break in daily school practice.

It is well known that the implementation of PA programs in school often fails because of the pressure of reaching academic goals that most teachers feel, with the result that extra time is rarely made available for PA in addition to the regular break and PE lessons (11,12). Another contributing factor to implementation failure is the teacher-perceived ineffectiveness of the PA program (13). Therefore, the SMART MOVES! intervention, which is evaluated in this study, was designed to (a) fit the needs and preferences of teachers (i.e., ready to use and a maximum length of 10 min) (14) and (b) contain important elements of programs that have proven to be beneficial to cognitive performance in primary school children (i.e., duration of minimal 10 min, moderate- to vigorous-intensity PA) (4–6).

In the current study, we evaluated the implementation process of the SMART MOVES! intervention, which was tailored to the preferences of teachers, to get more insight into the facilitators and in the remaining barriers under real-life conditions. The fact that we have evaluated the effectiveness of the PA breaks in a separate study ensures that we were able to monitor the process without interference of the actions of the research team in the current study, e.g., any form of support or reminders that might contribute to the improved implementation of the PA breaks. These insights can be used to improve future implementation processes of PA breaks in the school setting.

METHODS

Context

This study was conducted in primary schools in the Netherlands. Primary school teachers in the Netherlands are not used nor trained to facilitate PA in schools. Their main focus is teaching the core academic subjects, such as mathematics and Dutch language in the classroom. In most Dutch schools, children have a total of 90 min physical education per week (2 times, 45 min). Given the low daily PA levels of primary school children, the need to integrate more PA in the school day becomes of greater need. There is no Dutch governmental policy on the amount of PA that must be provided during the school day. Each school itself, and in most schools an individual teacher, decides if and how much time is available for implementing PA breaks during the school day.

Recruitment of Participants and Ethics

Schools were recruited between February and March 2017 via a recruiting brochure with the title “A PA break for your pupils is a SMART MOVE!,” which was spread via social media and e-mail. All fifth- and sixth-grade teachers working with 9- to 12-year-old children in Dutch primary schools were eligible to participate in this study. No other selection criteria were applied. Teachers who were interested received additional information on the purpose and procedure of the study by e-mail. Teachers who agreed to participate received a login and were able to use the intervention via a password-secured YouTube channel.

The Medical Ethical Committee of the VU University Medical Center Amsterdam concluded that the study does not fall within

the scope of the Medical Research Involving Human Subjects Act and approved the study protocol (2014.363).

Intervention—Just Dance Program

The intervention assessed in the current study consisted of 45 PA breaks, each including a different combination of three Just Dance video clips. Children were asked to mimic the dance movements as shown in the videos. As such, the PA breaks were of aerobic exercise type with coordinative and cognitive demands. Each PA break had a duration of 10 min and was executed in the classroom. We composed the Just Dance program based on 1) the acute exercise literature, indicating a minimum duration of 10 min and moderate- to vigorous-intensity exercise to exert cognitive effects (4) and 2) the preferences of Dutch teachers and children regarding feasible and enjoyable school-based PA (14). Detailed information on the development and pilot test of the intervention can be found in our previous published RCT on the effectiveness of the Just Dance intervention on children’s cognitive performance (10).

Procedure

We used a mixed-methods approach in which we collected quantitative (i.e., online registration of PA break use and questionnaires) and qualitative (i.e., interview) data before, during, and after the intervention period. Figure 1 shows the timeline of the study with the corresponding measurements. The Just Dance breaks were available for 20 wk, and the teachers could start implementing the breaks between the 3rd and the 31st of March 2017. Every time a teacher used a PA break, this was automatically registered via an online registration system. Between March and July 2017, we administered two online questionnaires, which were personally addressed to the participating teachers. The first questionnaire was sent to all teachers who agreed to participate in the study (5 wk after they received the login password), and the second questionnaire was sent to the teachers who maintained the intervention at week 15, based on information retrieved from the online registration system. The first questionnaire addressed the components “adoption” and “implementation” of the RE-AIM model, and the second questionnaire addressed the component “maintenance.”

In-depth interviews were conducted in a subgroup of teachers ($n = 5$) in the last 2 wk of the study period (weeks 19 and 20 of the study). Information from these interviews was used to provide context and understanding of the experiences of teachers and to check the collected data from the questionnaires. We randomly selected teachers with different experiences (mainly positive and mainly negative) from two groups, i.e., 1) teachers who dropped out/did not implement the intervention until the end and 2) teachers who implemented and maintained the intervention. From the answers they had given in the questionnaire, it appeared that three of these teachers were positive about using the Just Dance breaks and two were less positive.

With the current study, we aimed to evaluate the implementation process of PA breaks under real-life conditions, guided by the RE-AIM model (15,16). The RE-AIM model was originally developed as a framework for consistent reporting of research results and stands for reach, effectiveness, adoption, implementation, and maintenance, which together determine public health impact. Also, RE-AIM has been used to translate research into practice by identifying the relative strengths and weaknesses of implementation processes (17).

The components of the RE-AIM model were operationalized to identify the barriers and facilitators of the implementation processes of the Just Dance breaks (see Table 1). The fifth component, i.e., effectiveness, is described elsewhere (10). Via online

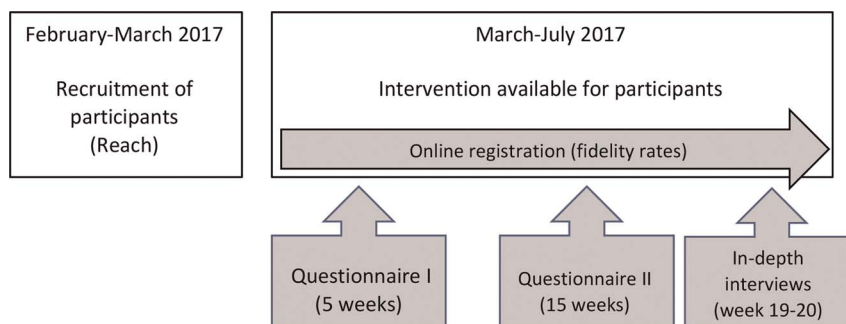


Figure 1: Timeline of the study.

registration, we automatically collected data during the intervention that provided insights into the number of teachers that were *willing* to implement the Just Dance breaks (reach), that *started* to implement the Just Dance breaks (adoption), that *implemented* the Just Dance breaks (implementation), and that *continued to use* the Just Dance breaks in their (daily) routine (maintenance). The questionnaires provided data on barriers and facilitators in the different phases of the implementation process, and these data were nuanced by data from the interviews.

ONLINE REGISTRATION SYSTEM

Every time a teacher used a Just Dance break, the online registration system automatically collected data with regard to date and time of use. These data gave us the opportunity to follow the teachers' implementation processes. Based on these data, we calculated the proportion (and number) of schools and teachers who adopted, implemented, and maintained the Just Dance breaks. After each Just Dance break, the teachers and pupils were asked to collectively rate the break on a scale of 1–5 (1, we did not like the Just Dance break at all; 5, we completely liked the Just Dance break) after it was finished.

QUESTIONNAIRES

The questionnaires (see Appendix A, Supplemental Digital Content 1, <http://links.lww.com/TJACSM/A101>) were based on the "Measurement tool for Determinants of Innovation" (MIDI), which was developed to measure relevant determinants of an innovation. MIDI provides questions on determinants in the different implementation phases from the RE-AIM model (18). The questionnaires were used to evaluate the different determinants that influence the use of the implemented Just Dance break. Teachers were asked to rate each question on a 5-point scale,

ranging from 1 "completely disagree" to 5 "completely agree" or from 1 "not at all" to 5 "completely."

Questionnaire 1 consisted of 12 questions about the following:

- the adoption phase (four questions), e.g., "Do you think it is part of your job to perform a daily PA break with your class?" and
- the implementation phase (eight questions), e.g., "Do you have enough time to implement the Just Dance break in your daily program?"

Questionnaire 2 consisted of four questions about the maintenance of the program, e.g., "Do you notice the effect of the Just Dance breaks on your pupils is increased relative to the first few weeks of performing the Just Dance breaks?"

INTERVIEWS

Two experienced interviewers (A.G. and a research assistant) conducted five individual semistructured interviews. Three interviews were conducted face to face by two interviewers, and two interviews were conducted by one interviewer via telephone. The data from the questionnaires were used to specify the questions per teacher. Before the start of the interview, we informed participants on the aim and duration of the interview, anonymity, and confidentiality. The importance of the participants' own opinions, experiences, and ideas was emphasized. We developed the interview guide based on the recommendations of Creswell (19). Eight core questions were addressed (see Appendix B, Supplemental Digital Content 2, <http://links.lww.com/TJACSM/A102>). The topics of these core questions were 1) the number of pupils that could perform the Just Dance breaks without problems and those that

TABLE 1.
Evaluation Components and Measurement Instruments According to the RE-AIM Model.

Component of the RE-AIM Model	Criteria	Data about Barriers and Facilitators Collected Via
Reach	Teachers who agreed to participate in the study and received a login	E-mail, administered in Excel
Adoption	Teachers who used a PA break at least once	Questionnaire 1, questions 1–4
Implementation	Teachers who used a PA break more than once	Questionnaire 1, questions 5–12
Maintenance	Teachers who used a PA break on a regular basis	Questionnaire 2, questions 1–4

needed extra support and how to deal with that (core questions 1–5) and 2) organizational aspect (core questions 6–8). During the interviews, the context and the experiences of the teachers, which they described in the questionnaires, were discussed and further explored to get a better understanding of their barriers and facilitators. The duration of the interviews was 30 min on average.

Analysis of the Results

We calculated the percentage and number of schools and teachers that adopted, implemented, and maintained the Just Dance program in Excel. Median and interquartile ranges of the outcomes of the questionnaires were calculated, and the Mann–Whitney *U* test was used to test significant differences between schools in different stages of implementation in SPSS (IBM SPSS Statistics, version 22). A *P* value <0.05 was considered significant. Most teachers did not register the rating of the Just Dance break regularly. Because of 64% of missing data for this outcome, no analysis was conducted for “enjoyment of the pupils for the specific Just Dance break.”

All interviews were accurately noted during the interviews and processed to detailed reports by AG and a research assistant. MJ and a research assistant analyzed the reports using MAXQDA (version 2018). We followed the step-by-step guide based on the approach of Braun and Clarke (20): we read the reports repeatedly and selected relevant text fragments (e.g., “five boys were less enthusiastic, they told me: I cannot dance”) to which preliminary codes were allocated (for this example, we used the code “gender differences”). By grouping text fragments with similar codes, themes (for example “engagement pupils”) and subthemes (e.g., “PA break (not) suitable for all pupils”) were created.

RESULTS

Figure 2 shows the number and proportion of schools and teachers that reached each phase of the implementation process and the most relevant barriers per implementation phase.

Reach

The reach of the total number of Primary schools in the Netherlands (*N* = 6700) is 0.24%.

Via the professional network of the researchers/SMART MOVES! consortium, which was mainly located in the North and Middle of the Netherlands, 126 schools were directly contacted. From these 126 schools, 26 schools responded and received additional information (reach 12.7%). In addition, we tried to reach schools in other parts of the Netherlands via social media. Because we do not know how many schools received our social media information, the exact Reach in the first phase could not be defined. Finally, 16 schools (31 teachers), of the 26 that received additional information, agreed to participate in the study, resulting in a final reach of 62%.

Table 2 shows the descriptive statistics of the schools, the participating teachers, and their classes.

Adoption

Thirty-one teachers from 16 schools agreed to participate and received login passwords. However, four schools (nine teachers) did not use the login to make use of the Just Dance breaks. Thus, 22 teachers from 12 schools started with the Just Dance breaks (i.e., used a Just Dance break at least once). Adoption can therefore be defined as 71% at teacher level, or 75% at school level (see Fig. 2).

The main barrier, as indicated in the first questionnaire, was time: lack of time in their daily program to do a PA break with their pupils, and also the length (i.e., 10 min) of the Just Dance breaks was perceived as too long. For example, one teacher searched for PA breaks on YouTube by himself because he preferred one Just Dance video (3 min) at a time, instead of a combination of three videos (10 min) as provided by the research team.

Table 3 presents the results on adoption (questions 1–4 from questionnaire 1). Both teachers who started and teachers who did not start using the Just Dance breaks (a) thought that it is important to do a PA break every day, (b) agreed that it is part of their job, and (c) were convinced of possible effects of PA breaks on children’s attention or cognition. Teachers who started using Just Dance breaks disagreed that colleagues’ participation is a requirement, median (interquartile range) = 1 (1.0–1.0); teachers who did not use the Just Dance breaks rated this item neutral, median (interquartile range) = 2.5 (1.75–3.25). Differences between the groups were not statistically significant. This finding shows that

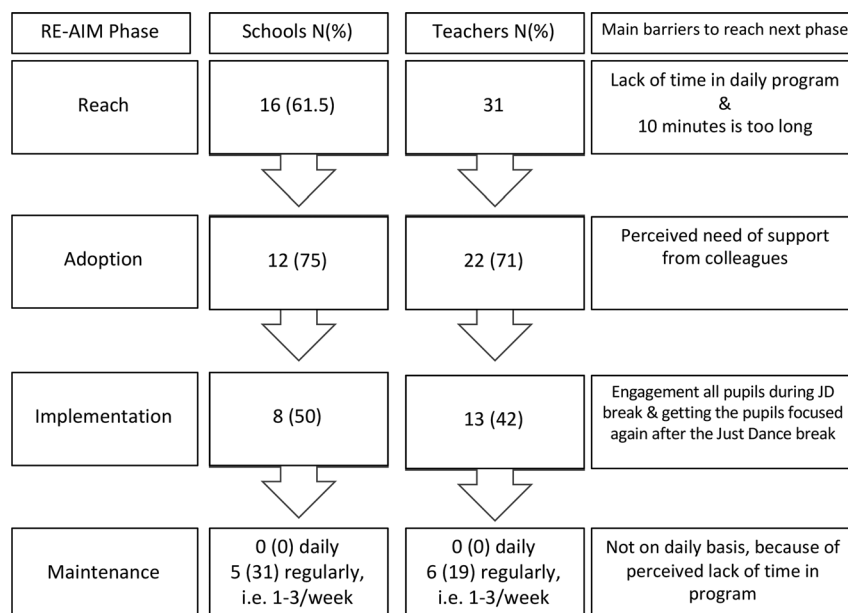


Figure 2: Results of the online registration; number and proportion of schools and teachers that reached each phase of the implementation process.

TABLE 2.
Descriptive Statistics of the Schools and Participants.

School Number	Location ^a	No. of Teachers Participating in This School	Group Size /Teachers in One Group at the Same Time	Stage of Implementation	Interviewed
1	Suburban	5	23/1	Adopted/Implemented	No
2	Urban	1	20/1	Maintained	Yes
3	Urban	1	28/1	Implemented	No
4	Suburban	2	48/2	Adopted	No
5	Suburban	2	25/1	Maintained	Yes
6	Suburban	5	45/2	Reached	Yes
7	Suburban	2	30/1	Adopted	No
8	Urban	2	25/1	Adopted	No
9	Suburban	1	16/1	Implemented	No
10	Urban	1	unknown	Reached	No
11	Urban	1	60/2	Maintained	Yes
12	Suburban	1	unknown	Adopted	No
13	Urban	1	16/1	Reached	No
14	Suburban	1	21/1	Maintained	No
15	Urban	3	25/1	Implemented/ Maintained	Yes
16	Suburban	2	unknown	Reached	No

^a The definition of urban and suburban is based on the environmental address density in the Netherlands. The definition “urban” was assigned when the location was included in the G40, i.e., the (medium) large city network of the Netherlands.

none of the teachers stated that it is a requirement that colleagues *participate* in the Just Dance program, but that teachers who did not adopt the Just Dance breaks are less resolute about this item.

Implementation and Maintenance

In total, 13 teachers at eight schools used the Just Dance breaks more than once. Therefore, implementation was 42% at teacher level or 50% at school level.

None of the teachers maintained the Just Dance breaks on a daily basis after 15 wk. Only six teachers (19%) from five schools (31%) maintained the Just Dance breaks on a weekly basis, i.e., 1 to 3 times a week (Fig. 2).

Teachers who implemented, but not maintained, the Just Dance breaks on a weekly basis, used the Just Dance breaks on average 4 wk, in which they used on average 3.8 (SD = 1.2) Just Dance breaks in total. Teachers who maintained the Just Dance

TABLE 3.
Results on Adoption (Results from Questionnaire 1, Questions 1–4 [after 5 wk of Implementation]).

Determinant	Teachers Who Adopted (<i>n</i> = 22, Missing = 4) Median [Interquartile Range]	Teachers Who Did Not Adopt (<i>n</i> = 9, Missing = 2) Median [Interquartile Range]	<i>Z</i> ; <i>P</i>
Importance daily PA break	4.0 [3.00–5.00]	3.5 [3.25–3.75]	<i>Z</i> = -0.619; <i>P</i> = 0.536
Agreement PA break part of their job	4.0 [2.50–4.00]	3.5 [3.25–3.75]	<i>Z</i> = -0.155; <i>P</i> = 0.876
Convinced of the possible effects of PA breaks on attention	4.0 [3.00–5.00]	4.0 [4.00–4.00]	<i>Z</i> = -0.157; <i>P</i> = 0.875
Participation of colleagues is a requirement to start using the Just Dance breaks	1.0 [1.00–1.00]	2.50 [1.75–3.25]	<i>Z</i> = -1.222 <i>P</i> = 0.222

n = number of teachers.

breaks during the study period of 15 wk used on average 29.8 (SD = 12.2) Just Dance breaks. Average group size (23, SD = 5.1, vs 24, SD = 4.7, respectively) and average number of boys in their class (11.0, SD = 3.9, vs 12.0, SD = 1.8, respectively) was comparable for teachers who only implemented or also maintained the Just Dance breaks.

Teachers indicated in the first questionnaire that they stopped using the Just Dance breaks because it was difficult to keep all pupils engaged for 10 min. According to teachers, boys seemed to lose interest during the Just Dance breaks. Teachers also indicated that pupils were very energetic after the Just Dance breaks, and therefore it was difficult to get them focused again in transition to the next lesson. This was a significant difference between teachers who implemented and who maintained the Just Dance breaks (see Table 4). As a result, teachers who did not maintain the Just Dance breaks perceived the total time needed to do the Just Dance breaks and getting the pupils back to focus on the next lesson as too long.

Teachers who maintained the intervention used the Just Dance breaks on a weekly basis, varying from one to three times a week. None of them performed a Just Dance break on a daily basis. Despite their belief of the possible beneficial effects of PA breaks on the attention or cognition of their pupils, these teachers indicated the (perceived) lack of time to perform a daily Just Dance break as the most important factor. Teachers stated they still noticed the effect of the Just Dance break on their pupils after using a Just Dance break, but in their perception, this effect did not increase relative to the first few weeks that they used the Just Dance breaks.

INTERVIEWS

Of the five teachers that participated in the interviews, one did not start (school 6), one teacher implemented (school 15), and three teachers maintained (schools 2, 5, and 11) the Just Dance breaks.

The analysis of the interview data resulted in three main themes: 1) “supporting environment”; 2) “organizational aspects,” with subthemes “ending Just Dance break” and “moment of Just Dance break”; and 3) “engagement pupils,” with subthemes “PA break (not) suitable for all pupils” and “atmosphere.”

Theme 1 (“supporting environment”) seems to be significant in the adoption phase. Data from the interviews showed that the need of support from colleagues depends on the group organization. Teachers who were coteaching with four colleagues in a unit of 100 children absolutely need the support of their colleagues. For example, one of those coteaching teachers indicated “when I am finished with my lesson, but my colleague is not, I need to wait for her to start with the PA break, which makes the children restless.” By contrast, a teacher who is teaching one group of 25–30 children is less in need of colleague support and those teachers implemented or maintained the intervention. In case two colleagues are sharing a class, teachers wanted their coteacher to participate as well because “if I do the Just Dance breaks, but my colleague does not, the pupils will be confused about the structure of the day.”

Theme 2 (“organizational aspects”) consisted of subthemes “moment of Just Dance break” and “ending Just Dance break,” which seemed to be most significant in the implementation phase (see paragraph “implementation and maintenance”). According to the interviewed teachers who implemented or maintained the

TABLE 4.
Results on Implementation and Maintenance.

Questionnaire 1, Questions 8–12 (after 5 wk of Implementation)			
Scale 1–5, ^a Median [interquartile range]	Teachers who implemented the Just Dance breaks (n = 13, missing = 1)	Teachers who maintained the Just Dance breaks (n = 6, missing = 1)	Z; P
Just Dance break suitable	4.0 [4.00–5.00]	4.0 [4.00–4.75]	Z = -0.908; P = 0.931
Pupils like Just Dance break	4.0 [4.00–4.00]	5.0 [4.25–5.00]	Z = 1.024; P = 0.429
Enough time to implement in daily program	2.0 [1.00–2.00]	3.5 [3.00–4.00]	Z = 1.581; P = 0.126
Easy to get pupils focused again after the Just Dance break	2.0 [1.00–2.00]	3.5 [3.00–4.00]	Z = 2.541; P = 0.009 ^b
Questionnaire 2 (after 15 wk of implementation)			
Importance daily PA break	–	3.0 [2.50–3.50]	
Convinced of the possible effects of PA breaks on attention	–	4.0 [4.00–4.50]	
Notice effect Just Dance breaks on pupils increased	–	3.0 [3.00–3.00]	
Teacher thinks pupils like Just Dance breaks	–	4.0 [4.00–4.50]	
Teacher recommend Just Dance breaks to colleagues	–	4.0 [4.00–4.50]	

n = number of teachers.

^a 1, disagree at all; 5, completely agree/1, not at all; 5, completely.

^b Significant difference between teachers who maintained and did not maintain PA breaks on a regular basis (i.e., one to three times a week).

intervention, two specific moments in the school routine appeared to be suitable for a Just Dance break: 1) at the beginning of the school day and 2) when changing subjects (“when I end the Dutch language lesson, I put on the Just Dance breaks and then start the Math lesson”). In addition, the teachers who maintained the Just Dance breaks also used the Just Dance break at varying moments during the school day when they thought their group needed to re-energize from low energy levels. Data from the questionnaires showed that a significant difference between teachers who implemented and who maintained the Just Dance breaks were the extent to which they experienced difficulties in getting the pupils focused again in transition to the next lesson. Teachers who maintained the Just Dance breaks indicated in the interviews to use a specific sign or an ending activity (e.g., counting back or blowing a whistle) to get their pupils focused again. One teacher explained, “I just put my hand in the air, which is the regular sign to sit still and pay attention.”

Theme 3 (“engagement pupils”) consisted of subthemes “atmosphere” and “PA break (not) suitable for all pupils,” which seemed to be most significant in the implementation phase (see paragraph “implementation and maintenance”). All teachers confirmed in the interviews that the atmosphere must be pleasant and socially safe to conduct the Just Dance breaks. Teachers suggested that it might be best to start the implementation of the Just Dance breaks when the group building process has not started yet, i.e., at the start of the school year. Teachers indicated that the Just Dance breaks were suitable for their pupils and that children liked the Just Dance breaks in general. For example, one of the teachers said, “when I forgot to do the Just Dance breaks, the pupils asked it, especially the children that cannot sit still.” However, teachers also indicated to observe gender differences. In all participating classes, a couple of boys did not want to participate in the Just Dance breaks. Teachers thought that these boys were less skilled (“they told me, I cannot dance”) or motivated (“the boys said, this music is boring, it’s for girls”) in performing the dance moves. Moreover, teachers indicated in the interviews that around 80% of the pupils engaged in the Just Dance breaks without any support, whereas 5%–10% of the pupils needed some form of support and 1%–5% of the pupils needed more intensive support. Teachers who maintained the Just Dance breaks gave the pupils who did not want to participate the freedom to watch or move in their own way (“I told them: just move around, I does not matter if you do not know the precise steps”) as long as they did not disturb the Just Dance breaks for the other pupils.

DISCUSSION

This study evaluated the implementation of Just Dance breaks under real-life school conditions, without added facilitation that often accompanies participation in research trials. The main result of this study is that none of the teachers who participated in this study was able to maintain the Just Dance breaks on a daily basis. Only 19% of the teachers were able to maintain the Just Dance breaks on a weekly basis, i.e., 1–3 times a week. This is in line with low implementation rates of other PA programs in schools (21,22).

Findings of an earlier study showed that teachers are willing to implement PA breaks in school because they care about their pupils’ well-being, but that this willingness was negatively impeded by scheduling and academic testing pressure (23). Other typically perceived barriers to integrate PA into the school day are lack of resources, lack of space, and lack of competence (24).

In this study, the main barrier was also teachers’ (perceived) lack of time. Although research evidence points to a 10-min break for effect on pupils’ attention levels, a shorter PA break

on regular basis might be better suited in the daily program. Moreover, perceived difficulties to keep all pupils engaged during the full Just Dance breaks (10 min) and/or difficulties to get the pupils focused again after the Just Dance break appeared barriers. Teachers who maintained the Just Dance breaks reported to know how to manage PA breaks in their group by using them when the children were low in energy and using a specific signal to end the activity in transition to the next (part of the) lesson. Probably, teachers who experienced difficulties during or ending the Just Dance break might have a lower level of competence organizing PA breaks. The main barrier (i.e., perceived lack of time) could be a result of lower motivational levels of teachers. The self-determination theory (SDT) (25) argues that people are more intrinsically motivated to perform a certain behavior when three basic psychological needs, i.e., autonomy, competence, and relatedness, are met. Teachers who maintained using the Just Dance breaks applied these breaks when they thought it was necessary (autonomy), were able to manage their group (competence), and, by doing so, kept the atmosphere in their group pleasant and safe (relatedness). To increase the motivation of teachers, and there with the implementation of PA breaks in their classroom on the long term, their autonomy could be enlarged by a choice from PA breaks that differ in length and type.

When we extend the SDT to the pupils’ behavior, it seems that a PA break performed with the whole class at the same time is unlikely to satisfy all pupils in their basic psychological needs (26). Not all pupils need a PA break at the same time (autonomy), but more importantly the Just Dance breaks we assessed in the current study require some basic dancing skill and do not differentiate between different levels of proficiency (competence). Therefore, pupils who are less competent mimicking dance moves probably will not feel safe to perform Just Dance breaks in front of the other pupils (relatedness). This results in motivational difficulties and, with that, organizational problems for the teacher.

The main barrier in the adoption phase was the importance of support from colleagues. There was a difference between teachers in their opinion about the importance of support from colleagues. Teachers who were coteaching need the support of colleagues more than teachers who do not share a class with other teachers. Studies from Webster et al. (27) and from Jorgensen et al. (28) underline the importance of school support but also point out that differences between teachers are found in interpersonal factors, such as teaching skills and the extent to which they see themselves as an innovative educator. Therefore, we recommend that teachers should be supported in their professional development on how to implement daily PA breaks. Stylianou et al. (12) concluded that teachers who had been taught classroom management strategies before implementing PA in their daily program implemented significantly more PA on more school days. Knudsen et al. (29) published a study protocol for a study on “understanding and scaffolding Danish schoolteachers” motivation for using classroom-based PA with the aims to 1) understand teachers’ motivation for using PA in teaching using SDT as a theoretical framework and 2) understand how teachers and their motivation can be maintained and supported by using the theory of scaffolding (i.e., guiding and supporting). The results of that study will provide useful insights into the kind of support teachers need for the successful structural implementation of PA breaks.

LIMITATIONS AND STRENGTHS

This process evaluation focused on the barriers and facilitators of teachers using a PA break intervention in the classroom. A limitation was the recruitment of the participants. There probably has been selection bias: teachers who feel enthusiastic about more PA during the school day or teachers who see themselves as an innovative educator might be overrepresented.

In this study, the perspectives of teachers were examined, but an additional evaluation of the implementation process from the pupils' perspective would have benefitted the study. We intended to collect data on "enjoyment of the pupils for the specific PA break," by asking the teachers and pupils to rate the PA break on a scale of 1–5 after finishing the PA break. Unfortunately, the majority of the teachers did not register the rating of the PA break on a regular basis, and therefore, we were not able to determine pupils' rating of PA breaks. It seemed that teachers stopped the video and closed the web browser before registering, immediately after the Just Dance break finished, and forgot to register the rating, which was (unfortunately) not mandatory. A possible explanation is that teachers ended the video and closed the web browser immediately after the Just Dance break finished, without rating the video. Also, an individual measure of students' engagement might be more accurate than including the whole class.

The interviews with teachers were conducted to gain more insight into the context and experiences of teachers who adopted, implemented, or maintained the Just Dance breaks. Unfortunately, the interviews were not audio recorded and transcribed verbatim. The interviews were only accurately noted and then processed to detailed reports, which were analyzed using MAXQDA. Although we analyzed these data carefully, a limitation is that we might have missed important data from the interviews.

An important strength of this study is that the process of evaluation of implementing the Just Dance breaks was done separately from the study on effectiveness of the Just Dance breaks (10). This enabled us to study the use of the Just Dance breaks under real-life conditions, which provides insights into future implementation processes.

In addition, the mixed-methods approach provided insights into different levels of the implementation process. The online registration system automatically collected data with regard to date and time of use of a Just Dance break, whereas the questionnaires and the interviews revealed the main barriers and facilitators in the implementation process.

Unfortunately, not all teachers responded to the questionnaires. Therefore, some bias could have occurred. On the other hand, for participation in the interviews, we carefully selected teachers in the different stages of the implementation process, ensuring to represent also those teachers who did not manage to implement the PA breaks.

CONCLUSION

The aim of the study was to evaluate the implementation process of the Just Dance breaks program. None of the teachers maintained the Just Dance breaks on a daily basis, and only 19% ($n = 6$) of the teachers on a weekly basis (i.e., one to three times a week). The main barriers were time, organizational aspects, and keeping all pupils engaged. We recommend that with regard to the successful implementation of PA breaks in the classroom setting, special attention is paid to

teachers' professional development on how to implement PA breaks in their classroom.

The current research is part of the SMART MOVES! Project, supported by a grant from the Netherlands Organization for Scientific Research (NWO; project number 328-98-003). NWO had no role in collecting the data or preparing the manuscript. The authors thank all participants: without the help of the teachers and children that participated in this study, the study could not have been performed.

MJ, AG, VvdB, and AS conceived and designed the study. MJ and AG acquired the data. MJ and AG analyzed the data. MJ, AG, VvdB, and AS interpreted the data analyses. MJ drafted the manuscript. VvdB, AS, and AG contributed to critical revision of the draft. All authors read and approved the final manuscript.

MJ had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

None of the authors have a conflict of interest to report. Authors do not have professional relationships with companies or manufacturers who will benefit from the results of the present study. All authors state that the results of the present study do not constitute endorsement by the American College of Sports Medicine.

REFERENCES

1. Clemes SA, Barber SE, Bingham DD, et al. Reducing children's classroom sitting time using sit-to-stand desks: findings from pilot studies in UK and Australian primary schools. *J Public Health*. 2016;38(3):526–33.
2. Van Stralen M, Yildirim M, Wulp A, et al. Measured sedentary time and physical activity during the school day of European 10- to 12-year-old children: the ENERGY project. *J Sci Med Sport*. 2013;17(2):201–6.
3. Verloigne M, Van Lippevelde W, Maes L, et al. Levels of physical activity and sedentary time among 10- to 12-year-old boys and girls across 5 European countries using accelerometers: an observational study within the ENERGY-project. *Int J Behav Nutr Phys Act*. 2012;9:34.
4. Daly-Smith AJ, Zwolinsky S, McKenna J, Tompowowski PD, Defeyter MA, Manley A. Systematic review of acute physically active learning and classroom movement breaks on children's physical activity, cognition, academic performance and classroom behaviour: understanding critical design features. *BMJ Open Sport Exerc Med*. 2018;4:e000341.
5. Janssen M, Toussaint HM, van Mechelen W, Verhagen EA. Effects of acute bouts of physical activity on children's attention: a systematic review of the literature. *SpringerPlus*. 2014;3:410.
6. Chang YK, Labban JD, Gapin JI, Etnier JL. The effects of acute exercise on cognitive performance: a meta-analysis. *Brain Res*. 2012;1453:87–101.
7. Singh AS, Saliassi E, van den Berg V, et al. Effects of physical activity interventions on cognitive and academic performance in children and adolescents: a novel combination of a systematic review and recommendations from an expert panel. *Br J Sports Med*. 2019;53:640–7.
8. Donnelly JE, Hillman CH, Castelli D, et al. Physical activity, fitness, cognitive function, and academic achievement in children: a systematic review. *Med Sci Sports Exerc*. 2016;48(6):1197–222.
9. Mavilidi MF, Drew R, Morgan PJ, Lubans DR, Schmidt M, Riley N. Effects of different types of classroom physical activity breaks on children's on-task behaviour, academic achievement and cognition. *Acta Paediatr*. 2020;109:158–65.
10. van den Berg V, Saliassi E, de Groot RHM, Chinapaw MJM, Singh AS. Improving cognitive performance of 9–12 years old children: Just Dance? A randomized controlled trial. *Front Psychol*. 2019;10:174.
11. Nathan N, Elton B, Babic M, et al. Barriers and facilitators to the implementation of physical activity policies in schools: a systematic review. *Prev Med*. 2018;107:45–53.
12. Stylianou M, Hodges Kulinna P, Naiman T. '...because there's nobody who can just sit that long'. Teacher perceptions of classroom-based physical activity and related management issues. *Eur Phy Educ Rev*. 2016;22(3):390–408.
13. Guldager JD, Andersen PT, von Seelen J, Leppin A. Physical activity in school intervention: context matter. *Health Educ Res*. 2018;33(3):232–42.
14. van den Berg V, Salimi R, de Groot RHM, Jolles J, Chinapaw MJM, Singh AS. "It's a battle ... you want to do it, but how will you get it done?": teachers' and principals' perceptions of implementing additional physical activity in school for academic performance. *Int J Environ Res Public Health*. 2017;14(10):1160.

15. Glasgow RE, Bull SS, Gillette C, Klesges LM, Dzewaltowski DA. Behavior Change Intervention Research in Health Care Settings: A Review of Recent Reports, with Emphasis on External Validity. *Am J Prev Med.* 2002;23(1):63–9.
16. Glasgow RE, Vogt TM, Boles SM. Evaluating the public health impact of health promotion interventions: the RE-AIM framework. *Am J Public Health.* 1999;89:1322–7.
17. Glasgow RE, Klesges LM, Dzewaltowski DA, Bull SS, Estabrooks P. The future of health behavior change research: what is needed to improve translation of research into health promotion practice? *Ann Behav Med.* 2004;27(1):3–12.
18. Fleuren MA, Paulussen TG, Van Dommelen P, Van Buuren S. Towards a measurement instrument for determinants of innovations. *Int J Qual Health Care.* 2014;26(5):501–10.
19. Creswell JW. *Educational Research: Planning, Conducting and Evaluating Quantitative and Qualitative Research.* Harlow: Pearson; 2014.
20. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol.* 2006;3(2):77–101.
21. Naylor PJ, Nettlefold L, Race D, et al. Implementation of school based physical activity interventions: a systematic review. *Prev Med.* 2015;72:95–115.
22. Turner L, Chaloupka FJ. Reach and implementation of physical activity breaks and active lessons in elementary school classrooms. *Health Educ Behav.* 2016;44(3):370–5.
23. Cothran D, Kulinna P, Garn A. Classroom teachers and physical activity integration. *Teaching Teacher Educ.* 2010;26:1381–8.
24. Strampel CM, Martin L, Johnson MJ, Iancu HD, Babineau C, Carpenter JG. Teacher perceived barriers and potential solutions to implementing daily physical activity in elementary schools. *Phys Health Ed J.* 2014;80:14–22.
25. Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol.* 2000;55:68–78.
26. Teixeira PJ, Carraca EV, Markland D, Silva MN, Ryan RM. Exercise, physical activity, and self-determination theory: a systematic review. *Int J Behav Nutr Phys Act.* 2012;9:78.
27. Webster CA, Caputi P, Perreault ME, Doan R, Doutis P, Weaver RG. Elementary classroom teachers' adoption of physical activity promotion in the context of a statewide policy: an innovation diffusion and socio-ecologic perspective. *Journal of Teaching in Physical Education.* 2013;32(4):419–40.
28. Jorgensen HT, Troelsen J, Agergaard S, Stylianou M. Diversity in teachers' approaches to movement integration: a qualitative study of lower secondary school teachers' perceptions of a state school reform involving daily physical activity. *Eur Phy Educ Rev.* 2019. doi: 1356336X1986556.
29. Knudsen LS, Skovgaard T, Bredahl T. Understanding and scaffolding Danish schoolteachers' motivation for using classroom-based physical activity: study protocol for a mixed methods study. *BMJ Open.* 2018;8:e019857.