Knowledge and Attitudes Towards Classroom Active Breaks Among Brazzaville’s Middle-Schoolers and Teachers of the Antonio Agostinho NETO General Education College

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Abstract

Background: Although classroom activity breaks (CAB) are essential for improving the learner’s level of moderate to vigorous physical activity, they are not implemented and the impact of their effects is very poorly understood. Purpose: To determine students and teachers’ knowledge on CAB and analyze the factors related to AA Neto middle school teachers’ CAB knowledge. Method: A total of 90 students and 52 teachers participated in this study. Student’s knowledge on CPAB and teacher’s knowledge and attitude on CAB and factors related to teacher’s knowledge on CAB were recorded with a questionnaire for about 20 minutes respectively. Results: The prevalence of student’s unawareness of CAB was high (87.8%) with a predominance of girls (92%). The prevalence of teacher’s unawareness of CAB was also high (78.8%) with a predominance of men (9 out of 2). Teachers had an unfavorable attitude towards the introduction of CAB. Lack of awareness of CAB was found to be significantly associated with age (OR = 0.95, CI = 0.92–0.99) and middle school diplomas (OR = 2.24, CI = 1.03–4.84) and high school diploma (OR = 5.06, IC = 1.72–14.86). Conclusion: Overall, these results demonstrate a significant lack of CAB knowledge among students and teachers at AA Neto middle school. Similarly, teachers have a negative attitude towards CAB. Finally, the age, the diploma and the behavior change at the individual level were predictors of teachers’ unawareness.

Introduction
Students in elementary, secondary and higher schools are today faced with constantly increasing academic pressure, associated with a significant drop in daily physical activity (PA) and a more or less high sedentary lifestyle, likely to harm their health [1]. According to Mok et al. [2] this pressure is due to radical societal changes that push to a good exam results, leading to the complete elimination of PA programs from children’s daily lives. In the context of the Republic of Congo, this pressure is due to enrollment in growing private schools, but to a large extent to the high time devoted to both regular classroom (7 to 13 hours), private instruction by tutors (3 to 6 PM) and daily reading (7 to 10 PM) as well as reduced participation in organized sports. In this sense, the Congolese school is
ultimately similar to an environment to which the individual is exposed to a prolonged sitting position [3]. However, this prolonged daily sitting time has become a very worrying public health problem because of its involvement in increased cardiometabolic risk, type 2 diabetes, all-cause mortality, a poor memory, attention, and visuospatial ability, leading to lower academic performance [4,5,6].

A large body of research suggests that a break from prolonged sitting time is thought to be a solution to reversing the harmful effects associated with school sedentary behavior [7,8,9]. For all these authors in fact, by targeting classrooms (where children spend the majority of their school day teaching in a seated position), we manage to keep students alert because this constitutes opportunities to practice learning physical activity. In fact, staying alert is even synonymous with academic success. For example, Peiris et al. [5] showed that academic success was closely associated with behaviors aimed at improving health through physical activities.

There are currently two strategies for awakening students: (1) physical activity interventions in class built around the dimensional adequacy of furniture and [2] the use of active breaks during classroom [1,3,10]. The first strategy has a dual objective: (a) by using different table-benches (sitting-standing, etc) in classroom, students are allowed to stay alert while remaining standing or moving. But, the results on improving cognitive performance remain mixed, with significant benefits in some studies and non-significant in others [11,12]. (b) By practicing physical education and sports courses, students are led to counter sedentary behavior in schools [5,8,10,13,14]. Even then the expected results in reduction of sedentary behaviors are not expected.

That is why classroom activity breaks (CAB) is considered as a good strategy to improve student’s level of moderate to vigorous physical activity (MVPA). It is a well-documented strategy and the results are convincing in many educational establishments [9,15].

CAB are short break durations varying between 4 and 30 minutes [7,8], administered either between two consecutive lessons, or during breaks taken during the same lesson or between two disciplinary lessons [7]. Kidokoro et al. [16] have observed that it increases students’ MVPA by six minutes. In a similar study, Podrekar et al. [3] reported that children observing CAB were likely to achieve 30 minutes of MVPA (OR 1.75, 95% CI = 1.22, 2.25, p = 0.002).

However, in the Republic of Congo, middle and high schools adolescents are exposed to a drastic drop in physical activity levels (PAL). Consequently, in a study carried out in Savorgnan de Brazza High school, Mabounda kounga et al. [17], observed a drastic drop in students PAL with preponderance among girls. Also, among the similar aged adolescents, Mabounda kounga et al. [18] observed a very high sedentary lifestyle due to the preponderance of screens among boys. If nothing is done, the combined effect of high screen time with a fewer classrooms physical activity breaks may produce harmful consequences. Looking at the numerous works undertaken in Congo, it is becoming apparent that no studies are relating to the CAB. This is our main concern for undertaking this study entitled: Knowledge and attitudes towards CAB among students and teachers of the Antonio Agostinho NETO General Education College (CEG AA Neto).

Methods

Study population and sampling

This study focused on all the students and teachers of middle school AA Neto. In view of the objectives of the study, the students and teachers present on the day of the survey were invited to take part in the study. The participants included students drawn from four sub-samples (7th grade, 8th grade, 9th grade and 10th grade) and the 65 teachers providing teaching in different classes. During this preliminary meeting, the researcher addressed letters to inform the parents of these students but also the teachers about the purpose and methods of the study. The researcher requested them to sign the consent respectively. Furthermore, the researcher also requested that students sign the letter of assent. To avoid any discrimination, all students attending the selected classes were invited to participate in the study. Subsequently, data from physical education and sports teachers were also excluded from the analysis. Complete measurements were obtained for 90 students (40 boys and 50 girls) and 52 teachers (38 men and 14 women). This study was approved by the Scientific Committee of High institute of physical education and sport of Marien Ngouabi University. The study protocol was designed in accordance with the Declaration of Helsinki and approved by the board of directors of the said institution.

Procedure

Before the actual data collection (April-May 2023), the trained researcher visited the school authorities and introduced the study procedure. In general, this intervention took place in a short time and did not disrupt the smooth running of the teaching programs. During implementation, teachers delivered their lessons normally in a classroom environment where students participated with enthusiasm. The attitude towards the establishment of CAB was observed by the researcher during the lessons (between chapters and between different disciplines). All activities are designed within a standard lesson plan. At one point, data relating to the knowledge of CAB of these students and teachers were collected using an anonymous questionnaire. This questionnaire was generally
structured as follows: the judgment criterion or dependent variable referred to knowledge about the establishment of CAB. It is a variable comprising two modalities, namely: “yes” when the respondent has knowledge and “no” when it is the opposite. Another criterion specific to teachers concerned information relating to the attitude towards the establishment of active breaks during their lessons. The variable also included the “favorable” or “unfavorable” modality. Independent variables were socio-demographic (age, gender, and diploma). It took approximately 20 minutes to complete the survey questionnaire under quiet classroom conditions.

Data collection protocol
The pre-survey:
To carry out this study, a data collection instrument (questionnaire) has been set up, based on received ideas, on questions frequently encountered and on the results found among work carried out by peers [19]. Subsequently, 20 questionnaires have been submitted to a small sample of teachers in middle school named AA Neto. After processing the collected data, we have evaluated the linguistic validity, construct validity and reliability of the instrument. Depending on the difficulties and errors encountered, the questionnaire has been slightly modified, adapted and readjusted. The survey itself:

It was focus on the relevance of the questionnaire to the phenomenon studied. It included all the variables on the association between sedentary behavior and physical activity intervention in class. The first section addressed focused on the characteristics of the subjects (What is your age?, (What is your seniority?). The second section focused on knowledge of a sedentary lifestyle linked to school and the intervention of physical activity in class. Finally, the third section focused on the association between sedentary behavior, physical activity intervention in class and the academic results of students.

Statistical analyzes of data
All statistical data were processed using SPSS version 25 software (SPSS Inc., Chicago, IL, United States). Three steps were followed to analyze the data. The first step was to use frequencies to present the prevalence of ignorance of CAB. Secondly, it consisted of determining the distribution of teachers’ attitudes towards the implement of CAB and the use of the chi-square test of independence. To examine the associations between the independent variables and the probable lack of awareness of CAB among teachers, the binary logistic regression test was used. Statistical significance at this level of analysis was determined using a p-value less than 0.05.

Results

Table 1: Sociodemographic Characteristics of AA Neto School Students and Teachers

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total</th>
<th>Boys</th>
<th>Girls</th>
<th>Sig p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students (N)</td>
<td>90</td>
<td>40</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Age (yrs)</td>
<td></td>
<td></td>
<td></td>
<td>0.93</td>
</tr>
<tr>
<td>7th grade</td>
<td>14.84 ± 1.37</td>
<td>14.86 ± 1.44</td>
<td>14.82 ± 1.31</td>
<td></td>
</tr>
<tr>
<td>8th grade</td>
<td></td>
<td></td>
<td></td>
<td>0.95</td>
</tr>
<tr>
<td>9th grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10th grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of study</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachers (N)</td>
<td>52</td>
<td>38</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Age (yrs)</td>
<td>39.71 ± 6.43</td>
<td>40.21 ± 6.83</td>
<td>38.36 ± 5.15</td>
<td>0.36</td>
</tr>
<tr>
<td>Diploma</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CEFN</td>
<td>11.5 %</td>
<td>10.5 %</td>
<td>14.3 %</td>
<td></td>
</tr>
<tr>
<td>CAPCEG</td>
<td>78.8 %</td>
<td>78.9 % **</td>
<td>78.6 %</td>
<td>0.006</td>
</tr>
<tr>
<td>CAPES</td>
<td>9.6 %</td>
<td>10.5 %</td>
<td>7.1 %</td>
<td></td>
</tr>
<tr>
<td>Professional experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 years</td>
<td>42.3 %</td>
<td>42.1 % **</td>
<td>42.9</td>
<td>0.001</td>
</tr>
<tr>
<td>6-9 years</td>
<td>40.4 %</td>
<td>39.5</td>
<td>42.9</td>
<td></td>
</tr>
<tr>
<td>10 years more</td>
<td>17.3 %</td>
<td>18.4</td>
<td>14.3</td>
<td></td>
</tr>
<tr>
<td>Fields</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math</td>
<td>38.5 %</td>
<td>50.6 % ***</td>
<td>6.7 %</td>
<td>0.000</td>
</tr>
<tr>
<td>Biology</td>
<td>25.0 %</td>
<td>18.8 %</td>
<td>44.1 %</td>
<td></td>
</tr>
<tr>
<td>French</td>
<td>26.9 %</td>
<td>21.0 %</td>
<td>41.2 %</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>9.6 %</td>
<td>9.6 %</td>
<td>8.0 %</td>
<td></td>
</tr>
</tbody>
</table>

Legend: CEFN, indicated teaching in primary school diploma; CAPCEG, indicated teaching in middle school diploma; CAPES, indicated teaching in high school diploma.
In this table, the average age of the students surveyed was $14.84 \pm 1.37$ years and that the boys were slightly older ($14.84 \pm 1.44$ years) than the girls ($14.71 \pm 1.31$ years). The students in class 7th grade were more numerous to participate in the study (36.7%) with a greater participation of boys than girls. Furthermore, the average age of the teachers surveyed was $39.71 \pm 6.43$ years and that men were slightly older ($40.21 \pm 6.83$ years) than women ($38.36 \pm 5.15$ years). The majority of teachers had a CAPCEG diploma (78.8%) with a higher distribution among men ($p < 0.006$), professional experience of 5 years (42.3%) with a higher distribution among men ($p < 0.001$). Finally, the majority of men ($p = 0.000 < 0.001$) taught the mathematics course (38.5%).

![Figure 1: Students’ Knowledge of Classroom Physical Activity Breaks](image1)

Figures 1a and 1b show that the prevalence of ignorance was high among students (87.8%) with a predominance of girls (92%) among the students who agreed to know about CAB.

![Figure 2: Teachers’ knowledge of classroom physical activity breaks](image2)

Figures 2a and 2b show that the prevalence of ignorance was high among teachers (78.8%) with a predominance of men (9 out of 2) among the teachers who agreed to know about CAB.

![Figure 3: knowledge of active breaks according to discipline and seniority](image3)

Figure 3a shows that among the teachers who agreed to know about CAB, the majority taught mathematics lessons (4 out of 11), followed by SVT and French lessons (3 out of 11 respectively). Figure 3b shows that among these same teachers, the majority had professional experience of less than 5 years (5 out of 11), followed by those with professional experience of 6 to 9 years (5 out of 11).
Figures 4a, 4b and 4c show that teachers had an unfavorable attitude towards the introduction of CAB. Only a minority of these (90.9% of the 11 teachers) have knowledge of CAB, 81.8% stop classes for 10 minutes to adopt active breaks, 72.7% integrate active breaks and 90.9% recognize the benefits of applying these breaks in class.

Binary logistic regression analysis showed that in the absence of risk factors, AA Neto school teachers had 0.235 times the chance of recognizing CAB (B = -1.44; p < 0.000; OR = 0.235). Examining the overall indicator of significance (chi-square = 26.99; p < 0.000), it appears that, collectively the predictors affected the risk of introducing active breaks. Lack of awareness of CAB was found to be significantly associated with age (OR = 0.95; CI = 0.92–0.99) and CAPCEG diplomas (OR = 2.24; CI = 1.03–4.84) et CAPES (OR = 5.06; IC = 1.72–14.86).

**Discussion**

This study aims to determine students and teachers’ knowledge on CAB and analyze factors related to AA Neto middle school teachers’ unawareness of CAB. With the results of previous work serving as a basis for discussion, we make the assumption that students were unaware of CAB and that teachers in turn were unaware and did not implement CAB. We note that Figures 3a, 4a and 6 as well as Table 2 provide evidence that students on the one hand and teachers on the other hand were unaware of CAB and that the latter were not introduced by the majority of teachers.

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>Std Err</th>
<th>Wald</th>
<th>Sig</th>
<th>OR</th>
<th>95% confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-0.04</td>
<td>0.01</td>
<td>6.02</td>
<td>0.014</td>
<td>0.95</td>
<td>0.92 – 0.99</td>
</tr>
<tr>
<td>Gender Females (Réf)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mens</td>
<td>0.24</td>
<td>0.16</td>
<td>2.20</td>
<td>0.137</td>
<td>1.28</td>
<td>0.92 – 1.77</td>
</tr>
<tr>
<td>Diploma CEFN (Réf)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAPCEG</td>
<td>0.80</td>
<td>0.39</td>
<td>4.20</td>
<td>0.040</td>
<td>2.24</td>
<td>1.03 – 4.84</td>
</tr>
<tr>
<td>CAPES</td>
<td>1.62</td>
<td>0.55</td>
<td>8.71</td>
<td>0.003</td>
<td>5.06</td>
<td>1.72 – 14.86</td>
</tr>
<tr>
<td>Professional experience &lt; 5 years (Réf)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 à 9 years</td>
<td>-0.32</td>
<td>0.18</td>
<td>3.25</td>
<td>0.071</td>
<td>0.72</td>
<td>0.50 – 1.02</td>
</tr>
<tr>
<td>10 years more</td>
<td>-0.65</td>
<td>0.36</td>
<td>3.23</td>
<td>0.072</td>
<td>0.52</td>
<td>0.25 – 1.06</td>
</tr>
</tbody>
</table>

**Table 2: Factors Predicting Lack of Awareness of Active Breaks Among Teachers**

Student and teacher unawareness of classroom physical activity breaks

In the present study, we found that 87.8% of students (fig 3a) and 78.8% of teachers (fig 4a) ignored the implement of CAB. This lack of knowledge was more prevalent among female students (fig 3b) and male teachers (fig 4b). For these students, this is explained by that fact spending most of their time at school in sedentary activities rather than moderate-to-vigorous intensity physical activities (mod-vig PA). In addition, this is due to the lack of involving in CAB [20]. Also, it can be explained by the lack of successful implementation of a policy aimed to reduce sedentary behavior and increasing physical activity levels among students. Finally, it can be explained by the lack of programs aimed to promote health [21]. Among teachers, the unawareness is explained by the absence of a policy requiring the establishment of these CAB and the lack of willing to impose these CAB on all students in the Republic of Congo, including students with special needs and those practicing at least twenty minutes of sustained mod-vig PA each school day [22]. It can also be explained by the lack of evaluation of the
contributions of physical education and sports courses to physical fitness outcomes of students, in improving behavior, concentration, and academic performance [22]. In this study, only 11 teachers or 12.2% introduced CAB (fig 4a). This low rate is in agreement with the comments of Carlson et al. [23] and assumes that these few teachers are aware of the health benefits of active breaks (fig 6c), but do not apply because of the existence of "push" obstacles (insufficient resources to train all teachers) and "pull" obstacles (many teachers not wanting to attend training). Another reason is that these few teachers do not use these teaching strategies because of unavailability of time within the teaching program, lack of accountability and performance measures required for the program.

Teachers’ attitude towards the introduction of classroom physical activity breaks

In the present study, we found that 72.7% stop classes for 10 minutes, 72.7% introduce CAB and 90.9% recognize the benefits of applying these breaks in class. This result can be explained by a desire to plan new teaching strategies, although requiring time and commitment on the part of the teacher [21]. The introduction of active breaks by a small number of teachers surveyed can be explained by the fact that teaching strategies are perceived as being unsupported and not prioritized within the school environment [22]. According to Allison et al. [22], the establishment of CAB is conditioned by the implementation of the personality of the teacher, his level of personal effectiveness/confidence, his relevant education, his convictions on the importance of the program and its experience in terms of physical activity. In the present study, the teachers’ survey was carried out using a subjective method (the questionnaire) and the dependent variable on the introduction of CAB was based on the question “Have you heard of lecture breaks?” physical activities in class? » to which the teachers responded with “Yes” or “No”. In this sense, the question asked constituted an imprecise measure that was potentially subject to social desirability bias [1]. It is even possible that fewer than 11 reported teachers implemented the intervention, and that some teachers only implemented the intervention a few times rather than regularly. It is therefore difficult to certify that the teachers of the CEG A. Neto the establishment of CAB can be explained by the personality of these teachers, their level of personal effectiveness/confidence, their relevant education and their their beliefs about the importance of the program. However, many of the teachers at CEG A. Neto did not introduce CAB due to lack of experience in physical activity. For this, classroom teachers must necessarily be assisted by a teacher specializing in physical education working in the school [22,24].

Facteurs Predictors of unawareness of classroom physical activity breaks

According to Carlson et al. [23] as well as Powell et al. [25], understanding how predictors relate to the implementation of CAB can inform the development of improved implementation strategies. In the present study, the age of teachers appears to be a key factor in lack of awareness of CAB. We found that the increase in age by one year was accompanied by a decrease in teachers’ knowledge of active breaks of approximately 4% (B = -0.04; p < 0.05). This result shows that teachers had 0.95 times the chance of ignoring CAB (OR = 0.95, CI = 0.92–0.99). It goes against the results reported by Carlson et al. [26], indicating that teacher characteristic such as age was not related to intervention implementation. This result indicates that age is a factor that is not obligatory to be targeted in improving knowledge about CAB. Then a younger teacher is likely to appropriate the knowledge and method of establishing CAB compared to older teachers. This result reveals that interventions related to age could target the diploma and seniority of teachers to support this lack of knowledge. It appears that seniority is not also a factor to target to improve knowledge during CAB. Indeed, our results reveal that any increase in seniority factor of one year was accompanied by a drop in teachers’ knowledge of active breaks of approximately 32% (B = -0.32; p > 0.05) for those with experience of 5 to 9 years and around 65% (B = -0.65; p > 0.05) for those with experience of 10 years and more. This result reveals that teachers had 0.72 and 0.52 times the chance of ignoring CAB respectively for those with professional experience of 5 to 9 years (OR = 0.72, CI = 0.50–1.02) and 10 years and over (OR = 0.52, CI = 0.25–1.06). This result indicates that despite high professional experience, a less experienced teacher can also acquire knowledge about active breaks provided that he has the time to research intervention models in theory lessons.

In the present study, the diploma obtained by teachers appears to be a key factor in lack of awareness of CAB. In the present study, we found that for every increase in teacher education by a factor, there was a very significant increase in knowledge of active pauses of approximately 80% (B = 0.80; p < 0.040) for teachers with a degree in CAPCEG and more than 160% (B = 1.62; p < 0.003) for teachers with the CAPES diploma. This result reveals that teachers had 2.24 and 5.06 times the chance of experiencing CAB respectively for those with the CAPCEG diploma (OR = 2.24, CI = 1.03–4.84) and CAPES (OR = 5.06, CI = 1.72–14.86). It can be used as a target to increase teachers’ knowledge of CAB. This result explains that many methods of physical activity interventions in the classroom, such as physical activity through the program (PAAC), Instant Recess,
etc., are not known to AA Neto middle school teachers with CAPCEG and CAPES diplomas would be willing to apply them.

**Conclusion**

This study highlights significant lack of CPAB knowledge among students and teachers at AA Neto middle school. Similarly, teachers have a negative attitude towards CAB. Finally, the age, the diploma and the behavior change at the individual level were predictors of teachers’ unawareness. We suggest that CAB be applied in the primary, the middle and the high schools. Also that the active participation of teachers in the establishment of CAB be encouraged and that evaluation tools be systematically used in these schools. Finally that strategies targeting age, diploma and behavior change be used to improve the implementation of CAB. However, there will be a need to focus on implementation strategies relevant to each school context, as evidence-based programs may not produce the desired results. Further studies are needed to assess changes in knowledge and attitudes toward active breaks as program revisions are made.

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**Conflict of Interests**

Authors declare no conflict of interest.

**References**


