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The Effects of a School-Based Physical Activity Teacher Intervention on the Physical Activity Attitudes and Practices of Adolescent Students in Lagos, Nigeria

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ABSTRACT

*Background**:** Nigerian adolescents are faced with challenges around physical inactivity. Poor attitudes to, and practices in, physical activity during school physical education (PE) classes are also a challenge. Our study integrated an innovative PE teaching methodology (autonomous support style) into a professional development training (PDT) programme for teachers to promote PA among adolescents. The study aimed at determining the effects of this school-based physical activity intervention for teachers on the physical activity attitudes and practices of adolescents. This study employed a descriptive quantitative research approach to determine the attitudes and practices of adolescents. One thousand two hundred students were recruited from twenty-four junior secondary schoolsthrough an intact group design process. A PE teacher from each school was included in the PDT intervention programme. The main components of the intervention included training PE teachers to influence their students' attitudes and practices through the use of an autonomous support style of teaching.PE teachers allocated to the intervention group implemented the autonomous support style of teaching at the schools in the intervention group for four months. There was a pre-intervention baseline assessment of the students' physical activity attitudes and practices, with a second assessment following the intervention. Results showed that there were significant ($p<0.05$) changes, post-intervention, in the adolescents' attitudes to, and practices in, physical activity participation during PE classes, and at lunch or break-time during the school day.*

Keywords: physical activity; attitudes; practice; school-based; intervention; professional development training (PDT).

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Introduction

Physical activity (PA) has important health benefits during adolescence (World Health Report 2013). Regular physical activity reduces the risk of sedentary behaviour, possibly obesity and cardiovascular disease among adolescents (Andersen et al., 2011). Furthermore, regular physical activity during adolescence influences mental and emotional health, as well as physical well-being (Biddle et al., 2011; Singh et al., 2012). Inadequate leisure time, inactivity, obesity and chronic health issues plague the lives of millions of adolescents globally (CDFHS, 2013). Although the benefits of physical activity are well documented, the participation of adolescents in physical activity has drastically declined globally, with many adolescents adopting sedentary lifestyles (Hallal et al., 2012). Moreover, the widespread inactivity among adolescents has been steadily increasing over the past few decades, and the harmful effects of this are reflected in the documentation of global health profiles (Lonsdale et al., 2016). In Nigeria, studies have also revealed that adolescents are not participating enough in physical activity (Adeniyi, et al., 2011; Akinroye et al., 2014; Mojisola and Oladimeji, 2017).

A school-based physical activity intervention could offer a platform for adolescents to participate more in beneficial PA. However, adolescents are physically inactive at school; and even during physical education (PE) classes, where physical activity is encouraged. In many schools, adolescents are still not participating enough (Deidre, 2016). A Nigerian study evidenced that the proportion of time spent doing physical activity in PE classes is low (35.5%), and this has consequently contributed to the students' negative attitudes to, and practices in, physical activity (Akinroye et al., 2014). Another study in Nigeria also highlighted that, despite certified PE teachers in Nigeria's education system, and the school structures acknowledging the health benefits of physical activity, Nigerian students' attitudes and practices are unlikely to lead to any health-related benefits (Akinroye et al., 2014). Some of the reason's researchers have given for the poor uptake of physical activity by adolescents in Nigeria include poor programme guidelines informing the roll-out of physical activity in schools, poor teaching methodologies adopted by teachers, and poor resources, such as a lack of facilities and equipment for physical activity (Adebayo, 2015). Schools are further challenged by systemic issues where PE is not prioritised and academic subjects are given precedence (Adeniyi et al., 2016). Researchers in previous studies have concluded that these factors negatively influence the attitude and practices of adolescents with regard to the uptake of physical activity (Physical Activity Guidelines Advisory Committee Report, 2008; Mojisola et al., 2017). Previous Nigerian studies have proposed the development and implementation of professional development training (PDT) programmes to mitigate some of these issues which are dissuading students from participating in physical activity in schools (Ajoku, 2013).

Growing evidence suggests that a PDT programme will enhance the teaching and learning platform in schools and could improve the attitudes and practices of adolescents regarding physical activity (Guskey, 2003; Adewale et al., 2016; Aubert et al., 2018) by offering appropriate and innovative approaches that are globally relevant (Adeniyi et al., 2016; Mojisola & Oladimeji, 2017). In this paper, the authors have developed a PDT programme through consultation with Nigerian PE teachers. The PDT programme included teacher-training workshops for PE teachers. The workshops introduced and integrated a new autonomous support style of teaching to promote physical activity. This paper aimed to determine the effects of a school-based physical activity PDT programme on the attitudes and practices of adolescents regarding physical activity in Lagos, Nigeria.

Methods

A descriptive quantitative research study was conducted to determine the attitudes and practices of adolescents regarding school-based physical activity, following a PDT intervention. The PDT intervention focused on PE teachers' knowledge of physical activity teaching methods during PE classes, as well as the application of novel methodologies to promote physical activity in schools. Creswell (2014) established that the method of data collection is essentially determined by the problem statement of the study and the research questions posed. In addition, Martin et al. (2015) explained that data, if it is to be generalised, should be structured using the scientific methods of a quantitative approach to investigate an identified problem, in order to determine the effect of a study or intervention on specific groups of people. Therefore, based on the problem and the related literature, the researcher chose the quantitative research approach to address physical activity attitudes and participation in junior secondary schools, following a PDT intervention for the PE teachers.

Study setting

The study was conducted in an urban area of Lagos State in Nigeria. The intact group method (this is an already-formed group of people in an organisation, such as classrooms of students in schools, political organisations and church groups) was utilised (Belton & MacDonncha, 2010). No selection procedure was used: all the schools in the Epe Local Government Area (LGA), Lagos State were included. All junior secondary schools in each of the Epe Local Council Development Areas (LCDAs) were selected. Six schools from Epe-central LCDA; eight schools from Agbowa-ikosi LCDA; and ten schools from Eredo LCDA were included, resulting in 24 junior secondary schools (JSS) participating in the study.

Sample and sampling procedures

The schools were assigned to either an experimental group or a control group in their various LCDAs, through the process of intact group design (based on the distance between the schools, the groups were in

the same LCDA area to allow mutual communication during the implementation, when the need arose). The experimental group included the students and PE teachers who participated in the PDT. A purposive sample of students (n=1,200) in junior secondary schools (JSS) was selected. The sample comprised 24 schools (14 intervention and 10 control); and of the 1,200 adolescents, 700 students were included in the intervention group and 500 students in the control group.

Procedures

The lead researcher visited each school and explained the purpose of the study, which was further clarified in the information and consent forms. The schools were then separated into intervention and control groups. The PE teachers in the intervention schools participated in the PDT intervention programme to upgrade their physical activity teaching methodology. The PDT programme on physical activity teaching methodologies was used to train teachers to promote physical activity among the students. The control group teachers continued with their normal teaching methods.

The intervention

The PDT intervention programme used a workshop approach to train PE teachers on physical activity teaching methods, including using an autonomous support style of teaching to improve the uptake of physical activity by students. The workshop training sessions introduced an autonomous support style of teaching as the teaching methodology (Hagger et al., 2013; Yew et al., 2013). It also offered advice on structuring the PE classes in motivationally adaptive ways and encouraged the involvement of the students by striving to satisfy their basic psychological needs (providing opportunities for choice and input; empathising with the students' perspectives; demonstrating and/or establishing peer-learning groups; supporting co-operation) (Lonsdale et al., 2016; The Community Guide, 2013). The intervention content covered physical activity teaching methodology to promote student physical activity during PE classes. The programme provided improved teaching approaches for the teaching of the existing PE syllabus content, in order to improve adolescents' attitudes and practices regarding physical activity. It also aimed to promote a learning environment conducive to (potentially) enhancing the students' health outcomes (Kahar et al., 2018; Cheon et al., 2015). It sought to develop a deeper understanding of the different strategies and methods used in teaching (James et al., 2011). The intervention also aimed to establish a proper understanding of the determinants of attitudes and practices regarding physical activity, before incorporating the teaching methods to promote physical activity during PE classes (Lonsdale et al., 2016).

Implementing the Intervention Programme

The PDT intervention programme addressed concerns regarding adolescents' physical inactivity at school, including during PE classes, and negative attitudes and practices towards physical activity. The PDT

programme was designed to introduce autonomous support styles of teaching when conducting practical classes. All content was in line with the existing PE curriculum; at the same time ensuring that physical activity was prioritised to promote physical activity in the school.

An autonomous support style offers the students' opportunities to choose the activity. This served as a strategy to motivate students to increase the intensity of their physical activity from moderate to vigorous. Furthermore, taking into consideration students' input and opinions, allowed the teacher to understand and acknowledge difficulties experienced by the students within the PE class. The intervention included educating teachers on the importance of clear instructions prior to tasks or activities; delivery methods, specifically regarding demonstrating the physical activity; and the establishment of peer-learning groups, where the teacher grouped the students together to demonstrate a given task. Each member of the group was responsible for solving the task, and for helping their teammates learn what they had been taught, until all group members successfully demonstrated and completed the task. The lack of resources was a challenge in many schools; hence, the teachers were also trained on equipment improvisation and on how to adapt games/sport/activities using the available resources.

The training workshops for teachers were conducted before the beginning of the school term. The PE teachers who participated in the training workshops were divided into three separate groups, and the workshops lasted for six days. Thereafter, the intervention was implemented across two school terms for a period of four months. The PE teachers implemented the skills learnt from the professional development intervention workshops. The intervention programme was monitored for two hours, every other day each week. The teachers reflected on their skills and knowledge, newly acquired in the training workshops, and their impact on the current delivery of their PE lessons. The teachers were assisted with queries and challenges experienced. In particular, teaching and learning methods were modified and adjusted throughout the duration of the intervention. This enhanced the teachers' learning experience and at the same time promoted enjoyable physical activity among the learners.

Data Collection

Students completed the Attitude and Practice of Physical Activity Questionnaire for Adolescents (APPAQ-A). The questionnaire, which has been used in similar studies elsewhere in Africa, measures the adolescents' attitudes and practices and was adapted for use in this school-based physical activity intervention. The tool was developed for adolescents by the Africa Centre for Disease Control and Prevention (ACDCP) (2010). The questionnaire is in three sections: Section A accessed the demographic data. Section B assessed the attitudes to physical activity, and comprised nine questions on a Likert scale of strongly disagree, disagree, neutral, agree and strongly agree. Section C assessed the practices regarding

physical activity during PE classes and physical activity at break or after school, and comprised 25 multiple-choice questions. The survey was administered pre-and post-intervention. The researcher and the research assistants administered the questionnaires, which took between 20 and 30 minutes to complete. Before the intervention a baseline assessment was conducted for all the students and a second assessment was conducted post-intervention.

Statistical Analysis

The data were analysed with descriptive and inferential statistics to test significant changes, from pre- to post-intervention. Analyses were specified, based on the student's responses on the questionnaires. These responses were grouped into demographic data; attitudes of students to physical activity; and practices of students regarding physical activity. The distributions of respondents' ages and gender were analysed. The one-sample t-test was used to test for significant agreement or disagreement to statements measuring attitudes to physical activity. The paired sample t-test explored differences in attitudes, pre- to post-intervention. The Wilcoxon Signed Ranks Test was used to analyse differences in physical activity pre-to post-intervention. Lastly, analysis of covariance (ANCOVA) was used to test the differences in post-intervention scores between the two groups, after being corrected for by the pre-intervention scores.

Ethical Considerations

Ethical approval was obtained from the University of KwaZulu-Natal (HSS/1750/018). Permission was also obtained from the Lagos State Ministry of Education through the Permanent Secretary. Before the study commenced, informed consent forms were obtained from the study participants.

Results

Questionnaires were completed by 1200 students at the initial stage of the study. At the post-intervention stage, a total of 1193 students completed the questionnaire, representing a 99.41% retention rate in the final analysis. The demographic information of the students who participated in this study is presented in Table 1. The ages of the respondents ranged from 13 to 16 years, with the majority either 13 or 14yearsold. There were more females than males.

Table 1: Demographic data

Variable	Categories	Full sample Frequency (%)	Intervention Frequency (%)	Control Frequency (%)
Gender	Male	490 (41.1)	288 (41.4)	202 (40.6)
	Female	703 (58.9)	407 (58.6)	296 (59.4)
	13 years	436 (36.5)	253 (36.4)	183 (36.7)

Age	14 years	309 (25.9)	176 (25.3)	133 (26.7)
	15 years	288 (24.1)	168 (24.2)	120 (24.1)
	16 years	160 (13.4)	98 (14.1)	62 (12.4)

The assessment of nine statements measuring students' attitude to physical activity participation during PE classes, both pre-intervention and post-intervention, is presented in Table 2. Of the nine items, five represent a positive attitude to physical activity and four represent a negative attitude to physical activity.

Table 2: Assessment of the students' attitudes to physical activity during the school day.

Item	**Period**	**Intervention (n=689)**	**p-value [1]**	**Control (n=493)**	**p-value [1]**
		Mean (SD)		**Mean (SD)**	
1. I would like to have more time to play sport or games with my friends.	Pre	2.99 (0.83)	<.0005	3.09 (0.72) *	.461
	Post	4.25 (0.66) *		3.13 (0.76) *	
2. I enjoy doing physical activities and playing physical games with my friends.	Pre	3.03 (0.79)	<.0005	3.07 (0.78) *	.155
	Post	4.31 (0.59) *		3.14 (0.82) *	
3. I find my physical education class interesting.	Pre	2.98 (0.78)	<.0005	2.92 (0.78) [$]	.781
	Post	4.39 (0.68) *		2.93 (0.82)	
4. I am excited about physical education	Pre	3.04 (0.77)	<.0005	2.94 (0.79) [$]	.168
	Post	4.27 (0.69) *		3.01 (0.77)	
5. The games and physical exercises we do in physical education class make learning fun.	Pre	3.00 (0.93)	<.0005	2.84 (0.77) [$]	.357
	Post	4.28 (0.84) *		2.89 (0.81)	
6. Physical education classes are boring.	Pre	2.89 (1.12)	<.0005	2.92 (1.07) *	.780
	Post	1.46 (0.66) [$]		2.94 (1.04) *	
7. I do not have fun when I am doing physical activity.	Pre	2.99 (1.21)	<.0005	2.77 (1.190) [$]	.030
	Post	1.37 (0.59) [$]		2.94 (1.18) *	
8. I feel uncomfortable or embarrassed in	Pre	2.91 (1.21)	<.0005	3.06 (1.19) *	.853

exercise clothes during PE classes	Post	1.58 (0.79) $		3.08 (1.18) *	
9. I see long sessions of exercise during PE classes as a punishment	Pre	2.64 (1.21)	<.0005	2.49 (1.23) *	.850
	Post	1.53 (0.64) $		2.50 (1.24) *	

SD=standard deviation

* indicates significant agreement at .05 level, following a one-sample t-test

$ indicates significant disagreement at .05 level, following a one-sample t-test

[1] paired samples t-test for differences pre- to post-intervention

For the intervention group, there was significant agreement (post-intervention) with all the positively-worded items; and significant disagreement with all the negatively-worded items. In addition, there was a significant improvement in their attitude to participation in school-based physical activity, reflected in all the items. While there was some significant agreement and disagreement with specific items, both pre-and post-intervention, the control group showed a significant change in only one item – 'I do not have fun when I am doing physical activity', with which less disagreement was shown post-intervention.

After correction for the pre-intervention scores, compared to the control group, the intervention group showed significantly more agreement with the positively-worded items and significantly less disagreement with the negatively-worded items. It is evident that the intervention had a positive effect on students' attitudes towards physical activity. The results are summarised in Table 3, below.

Table 3: ANCOVA analysis of the post-intervention results

Variables	**Estimated mean agreement scores post-intervention**		**p-value**
Items on ATTITUDE to physical activity	**Intervention group**	**Control group**	
1. I would like to have more time to play sport or games with my friends.	4.25	3.13	<.0005
2. I enjoy doing physical activities and playing physical games with my friends.	4.31	3.14	<.0005
3. I find my physical education class interesting.	4.39	2.93	<.0005
4. I am excited about physical education.	4.27	3.00	<.0005

5. The games and physical exercises we do in physical education class make learning fun.	4.28	2.89	<.0005
6. Physical education classes are boring.	1.46	2.94	<.0005
7. I do not have fun when I am doing physical activity.	1.37	2.94	<.0005
8. I feel uncomfortable or embarrassed in exercise clothes during PE classes.	1.58	3.08	<.0005
9. I see long sessions of exercise during PE classes as a punishment.	1.53	2.50	<.0005

Changes in the amount of activity undertaken in a selection of scenarios during PE classes, at break time and after school, before and after the intervention, were analysed for each group separately. The scale of measurement for each of the scenarios is as follows (Table 4):

- Q10: Students were asked to indicate how often they did each of nine physical activities (sports) during PE classes. A total activity score during PE classes was calculated by summing the responses across the nine sporting activities. The values of this score range from 0 (never do any activity) to 27 (does every activity five or more times in five days).
- Q11: The scale measured how often they were very active during PE classes, ranging from 0 (never) to 5 (always/nearly always).
- Q12: The amount of physical activity done in PE classes for a week ranged from 0 (not at all) to 15 (a lot on all five days).
- Q13: The amount of time spent doing vigorous activity in PE classes ranged from 1 (up to 30 min.) to 4 (>60 min.)
- Q14: The total activity score for physical activity at break and after school ranged from 0 (not at all) to 64 (all of the 16 activities performed seven times or more).
- Q16: The level of activity at break-time ranged from 1 (sat down) to 5 (ran and played hard)

The analysis of the changes, pre- to post-intervention, is shown in Table 4.

Table 4: Assessment of the students' practices regarding physical activity during school

Variable	Time	Intervention group(n=695)			Control group(n=498)		
		M(m) SD	Z	p-value	M(m) SD	Z	p-value
10. The amount of PA across all sports in PE classes, in the last five days	Pre	9.15(9) 4.363	-22.277	<.0005*	9.32(9) 4.380	-0.706	0.480
	Post	19.18(19) 2.969			9.13(9) 4.358		
11. In the last five days, during your PE classes, how often were you very active?	Pre	2.97(3) 0.985	-20.074	<.0005*	3.15(3) 1.061	-3.104	.002*
	Post	4.38(4) 0.611			2.89(3) 1.133		
12. How much physical activity did you do during PE classes on each day, last week?	Pre	7.22(7) 3.362	-11.751	<.0005*	7.95(8) 3.079	-2.520	0.012*
	Post	10.61(10) 1.705			7.57(8) 3.007		
13. How much time did you spend doing vigorous physical activities in PE classes, in the last week?	Pre	2.30(2) 1.045	-16.735	<.0005*	2.18(2) 0.914	-0.472	0.637
	Post	3.29(3) 0.574			2.16(2) 0.901		
14. How many times did students do any of the following activities in the past seven days at break or after school?	Pre	17.25(16) 8.149	-22.413	<.0005*	17.12(17) 7.979	-0.524	0.600
	Post	36.92(37) 5.514			16.84(17) 8.431		
15. In the last five weekdays, what did you normally do at lunch/break (besides eating)?	Pre		-20.727	<.0005*		-0.253	0.801
	Post	3.70(4) 0.723			1.88(1) 1.031		

*significance p≤ 0.005; SD= standard deviation; M=mean; (m)= median.

The results in Table 4, indicate that the intervention group showed a significant increase in physical activity across all scenarios during PE classes, during lunchtime and after school, pre- to post-intervention. For the control group, the only significant changes are seen in the level of activity during PE classes and the amount

of time they were very active during PE classes. For both of these, the level of activity decreased significantly after the intervention.

Based on an evaluation of the results, the study showed that the school-based physical activity PDT intervention significantly influenced the students' attitudes and practices regarding participation in physical activity. Students also spent more time doing school-based physical activity.

Discussion

This study aimed to determine the effects of a school-based physical activity PDT intervention programme for teachers on the attitudes and practices of adolescents regarding physical activity in Lagos, Nigeria. The study considered adolescents' attitudes and practices regarding participation in physical activity during PE classes and at lunch or break-time during the school day.

The PDT intervention programme in this study integrated the autonomous support style of teaching into the approach used by teachers to promote physical activity at school (Yew et al., 2013; Hagger et al., 2013). Following the PDT intervention programme attended by teachers in junior secondary schools, there was an evident improvement in student attitudes and practices regarding physical activity. This is in keeping with several studies, which found that the key to the successful teaching of PE in school is the use of interpersonal teaching methods, and exploring the choices of students as autonomous, supportive teaching methodologies (Graber, 2001; Graham, 2008). In a study conducted by Tessier et al. (2013), similar interpersonal styles improved students' physical activity levels. This finding is consistent with a previous study finding by Draper et al. (2010), which showed an improvement in student practices of, and attitudes to, physical activity in PE classes following a PDT intervention. Many studies have identified that teachers' teaching styles contribute to an improvement in students' attitudes and practices regarding participation in higher-intensity physical activity, particularly on days when they had PE classes (Murtagh & McKee, 2013; Pate et al., 2011; Meyer et al., 2011).

The teacher is, fundamentally, a facilitator of adolescent physical activity at school. Hiew et al. (2015) found that the teaching methodologies used by PE teachers resulted in improved attitudes and practices in PE classes. In their study the teachers made a deliberate effort to motivate students during PE class, using the new methods learned in their intervention, and this resulted in their students' positive attitudes and practices regarding physical activity (Hiew et al., 2015). In their study, Jenkinson and Benson showed that the involvement of the teachers in the design and implementation of their PDT also contributed to a positive change in the students' attitudes to, and practices in, PE class and they benefitted more from the physical activity (Jenkinson & Benson, 2010). PE teachers also had an important role in providing students with the skills; knowledge; values; positive perceptions and understanding of the benefits of

physical activity in order to facilitate long-term engagement in such activities (Hollis et al., 2017). In another study by Baghurst (2012), students' attitudes and practices regarding PE classes were, potentially, believed to be determined by teachers' skills, knowledge and effectiveness in teaching PE. This study highlights the importance of teacher intervention in influencing students' physical activity attitudes and practices.

Cardinal and Cardinal (2001) opined that a PDT programme provides an opportunity for the teachers to acquire skills and knowledge that promote physical activity and fitness. Similarly, the findings of the current PDT programme showed that the skills and knowledge acquired by the teachers during the PDT intervention subsequently influenced the students' practices. Hupinet al. (2019) believed that teachers who engaged in PDT gained skills and knowledge, which subsequently influenced students' attitudes toward PE. Similarly, Coulter (2012) explained that an improvement in physical activity attitudes and practices in the school system is directly linked to teacher capacity and engagement and is thus influenced by PDT interventions for teachers. Coulter (2012) asserts that the skills and knowledge gained by the teachers influence students' attitudes to, and practices in, PE. Adebayo (2015) emphasised in his study that students' attitudes and practices can be influenced by the teachers' teaching skills during PE class. In another paper by Guskey (2003), PDT for teachers was shown to be valuable in improving teachers' knowledge, updating their teaching skills and preparing teachers to address the challenges faced by today's schools.

In the current study, prior to the intervention, some students commented that PE lessons were boring, which contributed to their negative attitude. In line with these findings, Tannehill and Zakrajsek (1993), found that students in high school disliked participating in physical activity due to the dull choices of physical activity by PE teachers**.** The majority of the students who participated in this study also stated that they were bored by long sessions of exercise during PE classes. They also believed that vigorous physical activity was punishment**.** Another reason given by the students for their poor attitudes to physical activity was their embarrassment at wearing exercise clothes during PE classes. This was similarly noted in Tannehill and Zakrajsek's (1993) study of high school students who reported that they felt uncomfortable wearing exercise clothes for physical activity. In our study, following the intervention, many students indicated that they enjoyed doing physical activity because PE lessons were considered to be fun. In a study by McKenzie et al. (1994), adolescents indicated a much greater preference for playing games as a form of physical activity; and in a study by Solomon and Carter (1995), high school students were more engaged in PE, based on the 'fun' factor.

After our intervention, an effort was made to gather information on the time spent on physical activity during PE classes and at lunch breaks at school. The participants in our study's intervention group

showed an improvement in their attitudes and practices regarding physical activity, as well as in increased time spent participating in physical activity, both in PE class and during lunch breaks. Following the intervention, the findings showed an increase of over 45 minutes, from 30 minutes, for the intervention group, as compared to the control group, in the time students spent on vigorous physical activities. Furthermore, the intervention group showed an increase from three to four times per week, compared to the control group who participated once or twice in moderate to vigorous exercise. In a study, by Dobbins et al. (2013), on physical activity interventions for both teachers and students aged 6 and 18 years, the authors found that the physical activity intervention group showed an improvement in the amount of time spent on physical activity – similar to findings in our study. A similar result has been reported in a study on school PE interventions and programmes in midwestern United States primary schools, with an increase of 8% in the time students spent participating in physical activity daily (Trost et al., 2008).

Conclusion

In conclusion, teachers who have been trained in the PDT intervention programme will have the capability to effectively teach PE to promote physical activity and healthier lifestyles among adolescents in junior secondary schools in Nigeria. Teachers need regular training on physical activity promotion during PE classes through future, ongoing PDT. Furthermore, the PDT provides opportunities to develop good practices and improved attitudes in the area of physical activity.

The study was limited, as a purposive sample was used to access participants in Nigerian schools, resulting in a non-probability sample. Another limitation was the lack of parental engagement prior to developing the intervention. This would have provided the authors with a deeper understanding of the students' home environments, as well as other possible barriers to participating in physical activity. Studies assert that parental support influences students' attitudes and practices regarding physical activity (Kahar et al., 2018; Fuemmeler et al., 2011). Furthermore, research has shown that parents' involvement in students' physical activity may be effective in improving students' attitudes and practices regarding participation in physical activity (Dunton et al., 2012). Given this situation, Ha et al. (2019) found that involving parents in the physical activity intervention for school children may be beneficial in encouraging positive student attitudes and practices regarding physical activity. This needs to be explored further in our study context. The authors believe that future PDT programmes in Nigerian schools should also include consultation with teachers and school authorities to enhance the development of PDT programmes.

Author contribution

- Olalekan Remigious Osifeko was the principal researcher and was responsible for data collection, conceptualisation, and drafting of the article.

- Rowena Naidoo & Verusia Chetty were the project supervisors and they provided conceptual input into the research methodology and critical input throughout the writing process.

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