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Physical Activity and Self-Esteem.

'Jonny's Story'

Kristy Howells and Jo Bowen

Abstract

Previous research has proposed that physical exercise can raise self-esteem. This paper will examine the extent to which physical activity interventions, within one case study primary school supported the development of self-esteem of a (junior) year 5 child over a period of five months. Jonny was 10 years old when the physical activity intervention commenced. His name is a pseudonym to protect his confidentiality. Jonny had been measured on the school's wellbeing measurement scale and was reported to have a very low self-esteem, which had affected his learning through the previous two years in primary school. He was working in the low ability sets for both Mathematics and English and his self-esteem had hindered his ability to make and develop relationships with both adults and peers within his year group. Through participating in the physical activity interventions, Jonny increased the distance that he was able to throw a shot put and hammer, he was able to describe positively his own body movements and he improved his academic performances. The findings suggest that it is possible within a primary school case study setting, to improve self-esteem through physical activity interventions.

Key Words

Physical activity interventions; children's self-esteem

Article History

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Introduction

Collingwood et al. (2000) proposed that physical exercise can raise self-esteem. This paper will examine the extent to which physical activity interventions, within one case study primary school supported the development of self-esteem of a (junior) year 5 child over a period of 5 months. Jonny was 10 years old when the physical activity intervention commenced. His name is a pseudonym to protect his confidentiality. The intervention was undertaken over a long period of time (almost half the school year) to allow the teacher to fully investigate the long term impact of the physical activity interventions, self-esteem and possible effects on the child's learning (Laker, 2000).

Jonny had been measured on the school's wellbeing measurement scale and was reported to have a very low self-esteem, which had affected his learning through the previous two years in primary school. He was working in the low ability sets for both Mathematics and English and his self-esteem had hindered his ability to make and develop relationships with both adults and peers within his year group (Hayes, 2003; Wilson and Kendall-Seatter, 2010). Jonny's appearance was of a large child and he was aware of his size and physical self. This awareness, Marsh et al. (1994) has previously reported as also impacting on self-esteem, whilst Fox (1997) indicated self-perception as a reason for low physical activity participation. Ecklund and Bianco (2000) agree with Fox (1997), but their findings were reported for adolescents rather than primary aged children.

The aim of the research investigation was to inform future practice within the case study primary school. With the long term goal of designing further interventions to help improve individual's self-esteem, through physical activity, as a way to build confidence. Also to encourage positive relationships with exercise and inspire self-actualisation as proposed by Wilson and Kendall-Seatter (2010) and Laker (2000). The paper will firstly examine through the literature review, what is self esteem, secondly previous physical activity interventions that have been researched to try and to improve self esteem and thirdly how physical activity interventions have been previously linked to academic performance.

Literature Review

Self Esteem

Self-esteem is defined as the way we see ourselves, and the impact that can have on our mental well-being (Jacques and Hyland, 2004; Wilson and Kendall-Seatter, 2010). Research into the effect of physical activity interventions on self-esteem has been seen as ineffective, producing limited results with small focus and sample of participants (Roberts and Treasure, 2012). However, physical activity has been found to enhance both psychological well-being and self-esteem (Laker, 2000). The Mental Health Foundation (2013) supported this claim, explaining that participation in sport and physical activity can influence mental well-being, increasing self-esteem. Therefore, when researching physical activity interventions, with a focus on their impact on self-esteem, it could be claimed that involvement in physical activity would potentially impact on an individual's mental well-being and self-esteem. This coupled with the fact that a specific talent could be identified, built upon and celebrated regularly, would lead to positive focus on an individual which could go some way to improve self-esteem (Harris and Penney, 2000). A study conducted by Ekeland et al. in Norway in 2005, found a positive impact of physical activity on self-esteem. Their study was designed to determine if physical activity interventions improve self-esteem. There were 25 comparisons of young people aged between 3 and 20 years old, the results indicated that exercise could have a positive impact on self-esteem, although the study was regarded as small in scale (Ekeland, et al. 2005).

Physical activity interventions and interventions within Physical Education lessons, can be seen to help develop a stronger sense of self, allowing children to not only develop physically but mentally and socially too, encompassing and considering the whole child (Doherty and Brennan, 2007). Talbot, as cited in Doherty and Brennan (2007), proposed how increased self-esteem can not only enhance learning within a child's education, but have a positive impact on children's social skills which could in turn then impact upon their place within their learning community. Wilson and Kendall-Seatter (2010), proposed the need to consider Maslow's Hierarchy of Needs, when examining self-esteem and explained that a higher sense of self and self-esteem is more likely to be achieved when an individual's basic needs are realised, building towards self-actualisation and fulfilment. This then helps to build resilience, which can help children to overcome challenges with a positive outlook, readying them for an uncertain future (Robinson, 2010; Stevenson, 2008).

Physical Activity programmes and a whole school approach

Rees et al. (2001) recommended that for those “wishing to implement effective physical activity interventions, a whole school approach can promote greater involvement in physical activity” (p.6). They suggested that it is important to involve all members of the school community, including peer-led initiatives, in particular with regards to choosing the activities on offer. By focusing on the fun of the activity helps to improve confidence and self-esteem, according to Rees et al., (2001) rather than focusing on just mastering all skills within the activity. Gorely et al. (2009) completed an intervention programme involving a whole school approach and found that those children in the intervention schools had significantly increased the total time children spent at moderate to vigorous physical activity levels, compared to those in the control schools where the whole school intervention approach did not occur. The interventions included physical activity events such as one mile school runs / walks, using pedometers and accelerometers and recording fruit and vegetable consumption; however, they concluded that more work is needed on promoting fruit and vegetables as consumption levels were relatively low. Gorley et al. (2009) also suggested moving towards a whole school approach to involve parents and carers to help increase physical activity of children.

Barford (2010) explored the introduction of a cheerleading programme initiative to help boys in deprived parts of Leeds become more physically active. This was partially funded by Leeds' Primary Care Trust anti-obesity programme. According to Barford (2010), 37% of schools (in England) offered cheerleading in Physical Education lessons and this popularity may be in part explained by the appeal of street dance for young people and many recent popular TV programmes which include street dance such as *Glee* (Channel 4), *Step Up and Dance* (Bravo), *Britain's Got Talent* (ITV), *High School Musical* (Disney) and *So You Think You Can Dance* (BBC). The Leeds cheerleading programme DAZL, Dance Action Zone Leeds (seen on *Wonderland: Boy Cheerleaders* (BBC)) has been used in the city to improve the boys' physical health, as well as their mental wellbeing, their self-esteem and aspirations. Lindquist et al. (1999) suggested that physical activity of children is multidimensional and that social-cultural or social-economic factors are just one of many influences on children's activity patterns. It could be claimed, however, that the primary school day is multidimensional as it is a place where children spend half of their waking hours, (according to Owens et al., 2000). The primary school setting is also a stage and time in which habits, likes and dislikes are formed (Howells, 2012) and therefore is a very influential on children's participation and lifelong participation in physical activity.

Physical activity interventions and learning new skills

Physical activity interventions can take many forms, including; offering the opportunity to learn a new skill; to develop existing skills for competition and to encourage a change in behaviour, such as channelling energy to promote improved behaviour/social skills and increase self-esteem. Quender (2002) highlighted that children who took part in less physical activity had lower self-esteem and lower anxiety levels. Collingwood et al. (2000) suggested that physical activity raised self-esteem. Trudeau and Shephard (2008) proposed that young people that take part in physical activity have reduced depression, anxiety symptoms and, they also observed a positive association between physical activity and academic improvements in performance.

By encouraging physical activity through intervention sessions, class teachers have the ability to further highlight the importance of lifelong fitness and awareness of how to lead an active, healthy lifestyle (Pica 2008: Laker, 2000). Within physical activity interventions, teachers can demonstrate direct investment into a child's physical development and education, placing importance on an individual's health and well-being (Armour, 2011: Laker, 2000). Each session can be used to develop skills and interest in participating in physical activity that is beyond the weekly Physical Education lessons. Class teachers can plant the seed for an active, healthy lifestyle, promoting the importance of physical activity for young people (Harris and Penney, 2000: McKenzie, 2001).

Pollard (2010) proposed that highlighting a particular skill and celebrating/developing that skill can be an empowering experience, allowing children to recognise their strengths, which can have a positive impact on children's learning (Jaques and Hyland, 2004). Recognising talent and giving children the opportunity to increase their skill levels, can help to build confidence (Pickup and Price 2009). Through a tailored and focussed approach to physical activity interventions, children can have a more active role within their own learning (Graham, 2008). Thus ensuring children have an impact on their own education; are actively practicing specific skills in order to develop technique and in turn build confidence and self-esteem (Doherty and Brennan, 2007).

Quality teacher feedback during physical activity intervention sessions ensures individuals are aware of how they are doing, and could give them the chance to recognise how to improve/develop skills and be actively involved in their own development (Arthur, 2006). Through experiencing such assessment, children are more likely to be able to assess their own performance, a valuable life skill

and measure of confidence in their abilities (Mosston and Ashworth, 2001). Involving children in the next steps for the intervention programme can enhance the individual learning experience (Watkins, 2010). Therefore, teachers not only hand over a level of control, but also clearly demonstrate a level of respect for the individual (Hughes, 2008). This investment into the learning process can have a positive impact on a child's behaviour, giving them a vested interest in their own success, which could transfer to their wider education (Kyriacou, 1997). By including assessment in intervention sessions, teachers give children the chance to improve whilst demonstrating confidence in them as learners, enabling learning and skills building to take place rather than providing potentially irrelevant, standalone experiences (Hayes, 2003).

Physical activity interventions and academic performance

Trost (2007) emphasised the importance of physical activity and how it can lead to better concentration. Therefore, it could potentially be suggested that physical activity might lead to better academic performance. However, Keeley and Fox (2009) suggested that there may not be enough concrete evidence to prove the link between the two. The idea of a potential link is certainly attractive to educationalists (Keeley and Fox, 2009). Sibley and Ethnier (2003) identified a significant correlation between physical activity and cognitive function; measured in areas such as perceptual skills, IQ, verbal skills and mathematics skills. This was seen across all school age children in their study, but was particularly noticeable in children aged between four and thirteen years. Shoval and Shulruf (2011) considered that young children are more likely to benefit from movement based activities as it reflected their natural learning style and then were often promoted throughout the infant curriculum (DfEE/QCA, 1999; DfE, 2008). This was disputed by Trudeau and Shephard (2009) who argued that whilst there are a multitude of stimuli for learning there was a question as to whether physical activity is one of them.

The impact of age as a variable, when studying the link between physical activity and academic achievement, could be seen in the American study carried out by Caterino and Polak (1999). They found that daily physical activity had a significant positive correlation on the academic achievement of students aged between nine and ten years. Interestingly though, the correlation was not seen in any of the other year groups when studied by Sibley and Ethnier (2003) in their research. Vail (2006) identified that there was a significant positive correlation between the BMI of the students and their scores in mathematics tests. The validity of this study has to be called into question however as BMI

has been recommended by Eto et al. (2004), to be an inappropriate measure of children's fitness. Demerath et al. (2006) also proposed the measure to be unreliable in children as the BMI measure does not take into account growth.

Field et al. (2001) identified a significant positive correlation in academic achievement based on the amount of physical activity that the pupils achieved outside of school. Harrison and Gopalakrishnan (2003) furthered this investigation into physical activity and academic achievement in their large scale study in the USA, which found that children who took part in extracurricular sport were 58% more likely to spend 3 or more hours on homework a week. There were however, significant differences in terms of amount of equipment, space and opportunities available in the UK (where the research was located) compared to the extracurricular sport available in the USA, (with less being available in the UK).

In spite of these positive findings of physical activity and academic performance, several studies have found no significant improvement in academic ability despite increased physical activity (MacMahon and Gross, 1987; Raviv and Low, 1990; and Sanders et al., 2000). Notably, however, none of these studies have found that the time taken out of the curriculum for physical activity programmes was detrimental on academic achievement (Ahamed et al., 2007). It could be hypothesised that physical activity may have been contributing other positive benefits which were not necessarily academic. Kirk et al. (1989) focused on Physical Education lessons rather than physical activity programmes and they surveyed primary school teachers' perceptions on how daily Physical Education could impact on children's attitudes towards work and their academic performance. One such teacher described Physical Education lessons as having "definitely improved their school work and I can't prove that it has. But it has improved their outlook and the atmosphere in the class and that to me that's an improvement" (Kirk et al., 1989, p.14). Dollman et al. (2006) acknowledged that due to the individual's varying levels of participation and the differing nature of their physiological reactions, it was hard to generalise conclusions about the impact of physical activity programmes on academic achievement. They noted that it was important to consider the needs of the individuals and potential improvement that might occur for them.

It has been identified by Zoeller (2010) that the type of physical activity has little relevance to any academic improvement measured. Yet contrary to this, Knight and Rizzuto (1993) discovered that

literacy and numeracy scores were directly correlated to the children's ability to balance. Balance is an area that has not been previously found to be correlated to children's ability. However, some research suggested that physical activity in the form of games, which may involve problem solving, is beneficial to cognitive learning and engagement (Light, 2002). Webb et al. (2009) proposed that this kind of games based approach was beneficial to the children's cognitive learning as it required tactical thinking and decision making, rather than imitating body movement or learning motor skills. This was also supported by Doherty and Brennan (2007) who noted that these skills and others, such as strategising, creative thinking and evaluating could be developed through physical activity in the form of specific games activities. It may be that this could have been due to the children having used higher order thinking to engage with the physical activity (Bloom, 1956).

Methodology

The research setting

The research was conducted within an English primary school of which followed the English National Curriculum (DfEE/QCA, 1999). The school was geographically located in the suburbs of a large town in the South East of England. The school is a one form entry school with less than 200 children in seven classes, one class per year group. The school was chosen as it was one in which the researchers were familiar with and had worked within. The school represented as Hammersley and Atkinson (1995) referred to it as a 'good opportunity' to explore in detail current practice and how physical activity interventions could potentially help develop the self-esteem of one child, whom had been identified by the school's wellbeing measurement scale as having very low self-esteem. The child had just started (September) in the class teacher's class when this low level of self-esteem was identified. The physical activity interventions were started in January of the same academic year. Following Thomas et al. (2005) advice that "rapport is everything" (p.349) and time is needed to build this rapport and trust, the class teacher did not start the physical intervention until a third of the way through the year and followed this through for a long period of time, as a rapport was needed to be developed with Jonny, who struggled with relationships. The class teacher spent time to build a level of trust and sharing that helped Jonny feel more connected and have a sense of belonging; and wanting to be part of the physical activity interventions; which Greenhow and Burton (2011) suggested can help students to perform better.

The case study design

The use of a case study research design within one school, and one child, allowed for a focused analysis and investigation. Humes and Bryce (2001) advised that a researcher undertakes “investigative activity intended to yield new knowledge and understanding” (p.330). By the teacher positioning themselves in the research, in a centralised setting, they were able to observe and record a form of critical realism through action research to examine a ‘what works’ approach (Bridges, 1999) throughout the research. Greig et al. (2007, p.46) suggested that predictions could be made “to populations represented by samples being studied”; here they were referring to the other children within the case study setting of the primary school, who may be identified as having low levels of self-esteem according to the school’s wellbeing measurement scale. There is the possibility that the results from the physical activity interventions could be generalised to the children within the same classes of the case study school, who had the same teacher, as they would all be experiencing the same curriculum and format of the day and would also have the same physical activity intervention opportunities available to them.

It is recognised there are limitations (Roberts and Treasure, 2012) to generalising beyond the case study school and class without further research. However, Thomas et al. (2005) proposed that a case study can result in detailed information and findings due to the small scale of the participants. As the research intention was to examine the potential improvements in self-esteem of one child this was going to be limited findings, but very rich to the class teacher and their school setting and environment. As Coe (2011) suggested sport has the ability to change the lives of young people, and the class teacher and school wanted to see if this was possible through physical activity interventions. Physical activity interventions can take many offers including offering the opportunity to learn a new skill. In Jonny’s case the physical activity intervention was to learn a new throwing athletic skill. This was chosen as within the 3 months prior to the start of the physical activity intervention, Jonny had shown resistance in his willingness to participate in activities that focused on running or breathing heavily. He had shown an interest though to throwing activities and this was chosen by the class teacher as the focus of the invention

Timings of the physical activity interventions and data collection

In order to ensure Jonny had the best chance of improving both his athletic technique and his self-esteem, as well as acknowledging relevance and importance (Hayes, 2003) to the physical activity intervention, the timing of the intervention was scheduled to take place every Friday afternoon for thirty minutes, over 20 weeks, during 5 months (not including school holidays), totalling 600 minutes. Wilson and Kendall-Seatter (2010) highlighted the need to carefully co-ordinate any intervention activities, in order to ensure that a child does not become more isolated from their peers nor miss other equally important learning opportunities. The timing coincided with the weekly assembly, which also meant that all the other children, Jonny's peers were in the school hall, and were not able to watch his physical activity intervention, so this immediately put Jonny at ease, as he felt he wasn't being watched. Bailey and MacFadyen (2000) explained the importance of ensuring an individual's needs are met during Physical Education lessons, in the same way they are catered for within the classroom. Adopting this approach during intervention sessions would ensure this additional physical activity was relevant, engaging and fulfilling (Hayes, 2008; Kyriacou, 1997). Therefore, planning for each of the sessions and incorporating a mixture of teaching styles, should allow for enriching intervention sessions (Mawer, 1995).

Pica (2010) highlights well researched and detailed plans can enhance physical activity sessions, however, also explains that plans should be used flexibly, to extend activities and enhance children's desire to develop their skills. Therefore, feedback from and discussions with Jonny was vital to ensure that he felt included within the planning, this also allowed for him to express what he was enjoying and continued to boost his self-esteem. The assessment used with Jonny, was assessing and analysing the throwing skills performed. Howells (2015) identified the importance of having assessment that was measurable, such as describing movements that occurred or more objective measurements such as: distance; time and weight as key ways to effectively assess performance. For Jonny the ways in which different body parts were used to move, to support and extend the throw was analysed in a biomechanical way to help him understand the importance of each body part. This was supported through the use of video and photography to support discussion between the class teacher and Jonny. The phrases he used to describe his performance were recorded. The distance of his throws were also measured throughout to show his improvements. His academic performance was also compared before and after the physical activity interventions.

As part of the physical activity intervention, time was spent researching each of the throwing disciplines (shot and hammer) in the ICT suite, to help inform and inspire the child, with access to 'how to guides' and videos of top athletes completing each throw. This researching was used as a tool to hook (Hayes, 2003) Jonny into accessing and being excited about participating in new physical activity that he was not familiar with, and to prevent him from being nervous. Also Jonny enjoyed ICT lessons, so this initial visual learning, as Wyse and Dawson (2010) explain, can give children a feeling of safety. The joint researching by Jonny and the teacher, also gave the teacher a reference point to be able to examine to ensure that a clear and correct demonstration was provided to Jonny, the importance of which was highlighted by Armour (2011). This approach of research using technology was student centred and interactive enquiry based (Cotton and Winter, 2010) and allowed for cohesion between learning about the throwing techniques and then performing techniques, which Stuerzenhofecker et al. (2010) proposed is central to sustainability. Thomas and Stratton (2006) suggested that the use of technology can have a significant impact on motivation and ultimately on enjoyment. It was important to ensure that Jonny continued to be motivated during the physical activity interventions.

The class teacher used the ICT suite, alongside photography and video analysis to keep Jonny motivated, as she was worried that as he progressed that he would plateau and may become demotivated. She had prepared for this occurrence and for the moments when he may struggle to throw and feel like he was failing or falling behind. Pennyworth (2005) questioned why we fall? He suggested that this was so we can learn to pick ourselves up and to carry on. These 'down' moments were observed as quite turning points for Jonny. To start with he would get frustrated and not be able to express his disappointment other than in noises, but as the time progressed he was able to question what happened there, and to eventually being able to tell the class teacher what and why the throw went wrong. The class teacher also drew on the expertise of a Physical Education expert to support and discuss Jonny's progress.

Results

Item \ Timeline	At start	After 1 month	After 2 months	After 3 months	After 4 months	After 5 months
Shot	"The shot is really heavy,	"I have to push the	"I need to extend my	"I need to bend at my	"If I use my legs I can throw the	"I need to transfer weight

	I don't know how to throw this"	shot past my nose, but most of the time I just hit my nose!"	arm once I have pushed past my nose" "I am hitting my nose much less"	waist and use my waist, but that is so hard"	shot so much further. I must remember my legs"	from back foot. To transfer weight I need to lift back foot off the ground, this propels the shot putt forwards"
Hammer	"The hammer likes to get caught up round me! I can't do this."	"I have to remember to release the hammer, how does anyone do this?"	"Did you see that one fly?" "I released it in the right place" "I don't know where the right place is yet, but that one flew"	"Tree, I've got to look for the tree." "Turn, turn, turn, look for tree and release"	"Hula hoop, hula hoop. I feel silly thinking about hula hooping, but it makes the turning easier"	"If I imagine I am hula-hooping, when I turn the hammer over my head, this will cause momentum and help propel the hammer in the right direction"

Table 1 shows the words that Jonny used to describe his performance in shot and hammer within the 5 months of physical activity interventions.

Item \ Timeline	At start	After 1 month	After 2 months	After 3 months	After 4 months	After 5 months
Shot	5m	7m	9m	10m	11m	13m
Hammer	18m	23m (but not straight, diagonal)	22m	28m	31m	35m

Table 2 shows the improvements in distance that Jonny was able to make within the 5 months of physical activity interventions.

Subject	Level at start of physical activity intervention period	Level after 5 months of physical activity interventions	Difference between the levels
Reading	3b	4b	3 sublevels
Mathematics	3a	4a	3 sublevels

Table 3 show the improvements in his academic performance from the start of the physical activity intervention to the end of the physical activity intervention period



Figure 1 – Jonny throwing the shot put, and learning about transferring his weight from his back foot coming off the ground to help him propel the shot put.



Figure 2 – Jonny learning as he called it ‘hula hooping’ with the Hammer, his way of understanding how to move his hips to help with the momentum.

Discussion and analysis

Previous research into physical activity interventions and self-esteem found limited results and that the physical activity interventions were ineffective on the small number of participants included within the research sample (Roberts and Treasure, 2012). However, Laker (2000) advised that the interventions should be undertaken over a long period of time for an impact to be seen. Within this case study research it was found over the 5 month period, that improvements could be identified in Jonny’s self-esteem and also within his academic performance. The results suggested that unlike Roberts’ and Treasure’s research (2012) that the physical activity interventions within this case study were effective for Jonny.

Jonny's self-esteem improvements shown in Physical Education lessons and break times

Jonny became an expert at throwing in particular the Hammer and Shot Put (see figure 1 and 2). He was able to learn how to throw these two athletic throws in particular. He was able to respond to continuously increasingly difficult challenges such as expectations to increase distance and accuracy of his throws. Howells (2015) previously had identified the importance of having objective measurements such as describing movements and distances of throws. These assessment methods were both used within this case study (see Table 1 and 2) and acted as a guide of achievements and for target setting for the class teacher to use with Jonny. This increase in distance and accuracy in throws achieved led to Jonny's self-esteem increasing dramatically, to the extent that he was willing to participate in Physical Education lessons without needing constant encouragement. He was able to describe his own movements with links to his achievements and the parts of the body he was using (see table 1). It could be suggested this change in behaviour was brought about by the individual feedback and encouragement Jonny had received and that this experience had a positive impact on his wider education, as proposed may happen previously by Kyriacou (1997).

Jonny also experience greater social interactions than at the start of the physical activity intervention period and has been able to develop more relationships with his peers. He was invited by his peers to be on their teams for all throwing and catching related activities, he was first to be chosen or requested to be on teams for cricket, rounders, and even rugby, although Jonny still struggled a little with cardiovascular fitness. His peers wanted him on their teams as he had developed his throwing so much he could throw accurately and at a distance with ease. He was often asked to play games at lunchtimes, rather than previously being left out, prior to the interventions. He also did not try to avoid going outside due to an increase in his popularity with his peers. The other children were able to identify his specific talent and regularly celebrate. This positive focus of his peers and the increase in the number of times his talent was celebrated led to a positive focus, which Harris and Penney (2000) highlighted as a way to improve self-esteem.

Jonny was observed discussing his progress with other children within the class and making reference to his meetings and letters from the Physical Education expert and how impressed they were with his talent and progress. The class teacher reported that he had increased his participation rates and now always has his Physical Education kit in class, whereby before he would often leave his kit at home or

claim that he was not feeling well enough to participate. These observations link to the Mental Health Foundation (2013) proposals that participation in physical activity can increase self-esteem levels.

Impact of the physical activity interventions and Jonny's academic performance

Trudeau and Shephard (2008) proposed a positive association between physical activity and academic improvements in performance. Over the period of 5 months of the physical activity interventions, Jonny also improved his academic performance and increased his reading by 3 sublevels and numeracy by 3 sublevels, (see table 3) which was reported by the class teacher as a 'fantastic achievement'. At the end of the intervention time Jonny was able to complete SATs questions within numeracy and thrived on the challenge. He even requested extra questions to practice and complete, handing in homework independently, when at the start he lacked enthusiasm and was reluctant to participate within lessons. In reading he went from needing frequent reassurance of words to being able to use high level vocabulary and refer to text accurately with awareness of audience when writing. Trost (2007) proposed that these increases in academic performance are due to learning how to concentration and focus more within the physical activity sessions. Therefore through learning distance and accuracy and concentrating on how his body moves may have also allowed Jonny to concentrate more within his academic studies. The improvements in Jonny's reading and numeracy scores, may have been due to improvements in his balance, as he learnt how to transfer his weight within throwing the hammer and shot putt. This idea of improved balance (alongside improved self-esteem) is proposed and supported by Knight and Rizzuto (1993) previously discovered that literacy and numeracy scores were directly correlated to the children's ability to balance.

By the end of the physical activity intervention period, Jonny also successfully spoke in assembly, an activity that he would never have agreed to prior to the intervention. He used to shy away from attention and focus from his peers, but his new positive attitude to physical activity resulted in him putting himself forwards for the role of House Captain and undertaking drama activities, which he would have previously refused to participate in. This increase in self-esteem may have been due his positive experiences that he had within the physical activity intervention sessions, as Wilson and Kendall-Seatter (2010) and previously by Laker (2000) who both highlighted the importance of positive experiences in sport and how this could improve self-esteem. The class teacher also reported the importance of recognising and developing talents that each and every child has (Harris and Penney,

2000) and that without this physical activity intervention time, in their opinion, Jonny would not have developed in the ways that he had been able to.

Wider impact of the physical activity interventions

The class teacher shared what she regarded as the most proud moment, from the results and the impact of the physical activity interventions and the improvements in Jonny's self-esteem, came when Jonny was put forward by the head teacher and then subsequently successful at the local athletics events. This success enabled Jonny to then be invited by the local athletics club to join the club. Jonny (has since the completion of the data collection) has progressed to secondary and in year 7 was placed into the gifted and talented group for throwing within Physical Education lessons. The class teacher reported that they did not feel this would ever have happened had Jonny not been able to have the opportunity to participate in the physical activity interventions. Robinson (2010) suggested that by increasing self-esteem may help build resilience, by the fact that Jonny has continued with his athletics within a new school highlights that the physical activity interventions within this case study, may also have helped build his overall resilience.

Limitations of the Case Study

Despite the apparent limitations as outlined by Roberts and Treasure (2012) of using a small focused case study, it was clear that the focus child Jonny had undergone significant changes both with regard to self-esteem and academic achievement. Also social changes which have impacted on his self-esteem, in that he is now recognised by his peers as being popular and his efforts celebrated, which is then reflected in his overall increased positive self-esteem. Laker (2000) previously explained positive experiences of sport goes some way to improve individual's self-esteem; making a positive link to physical activity and therefore increasing the likelihood that young people will continue to lead an active and healthy lifestyle. Laker (2000) continued and aired caution with the emphasis on competitive performance as this can limit the positive impact of physical activity interventions within Physical Education lessons on children's self-esteem. This is particularly important to consider with the inclusion of competition within the new primary National curriculum (DfE, 2013). It is recommended for class teachers to be cautious with the use of competition and to consider self and

individual targets that are set against time, distance or weight targets that seem achievable for the specific children.

Recommendations

Robinson (2010) explains that one of the roles of education is to prepare children for uncertain futures, building resilience in order to fulfil their potential. Therefore, it is important for primary class teachers to consider the whole child and to build a clear understanding of individual needs (Jacques and Hyland, 2004). Tailored physical activity interventions, as seen for Jonny, could allow children to recognise their strengths, to boost confidence and self-esteem (Alexander et al. 2008). It is therefore recommended that primary schools use physical activity interventions especially for those children who are found to have low levels of self-esteem on school well-being measurements, but there would also be the potential for physical activity interventions to help support all children.

Collingwood et al. (2000) proposed physical activity can raise self-esteem, and following on from the positive results from this case study, the school has decided to continue with physical activity interventions, using a whole school approach to “promote a greater involvement in physical activity” (Rees et al. 2001, p.6). These interventions will be particularly for children who are identified as having low self-esteem, especially to help support academic performance as well as a way of raising self-esteem. The school felt that there is such a high demand on academic skills within the National Curriculum (DfE, 2013), specifically numeracy and literacy, self-esteem, confidence and positivity can sometimes become neglected (Robinson, 2010). In order for children to develop a positive outlook and to be resilient it is recommended (Watkins et al. 2007; Hughes, 2008) for such opportunities of physical activity interventions to be used, to help support children to become independent thinkers and motivated learners (Bandura, 1994).

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