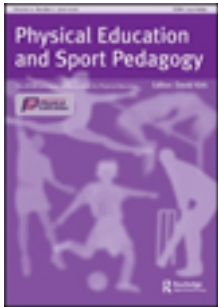


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Physical education teacher education students' knowledge, perceptions and experiences of promoting healthy, active lifestyles in secondary schools

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Background: Physical education teacher education (PETE) offers a context for students to learn about the promotion of active lifestyles in secondary schools through their interactions and experiences during the teacher education process. However, previous studies have found low levels of health-related fitness knowledge amongst PETE students, which is a concern given that there are high expectations of physical education (PE) to promote healthy, active lifestyles. In addition, international literature reveals a number of problematic issues associated with health-related teaching, learning and professional development in PE. Exploration of health-related experiences within the PETE process and consideration of the extent to which they address these previously identified issues were considered worthy of study because of PETE's potential to influence the health-related teaching of the students, and to ultimately impact the health-related knowledge and behaviour of the pupils they go on to teach.

Purpose: To explore PETE students' health-related physical education (HRPE) knowledge, perceptions and experiences during a PETE programme.

Participants and setting: Purposive selection of PE students on a one-year post-graduate secondary PETE programme at one University in England, working in partnership with up to 60 schools.

Research design: Case study.

Data collection: A qualitative approach founded on the interpretive paradigm was used, utilising a questionnaire completed by 124 PETE students.

Data analysis: Responses to the open-ended questions were analysed by means of the generation of themes using constructivist grounded theory methods.

Findings: At the outset of their programme, PETE students' knowledge of how active children should be was limited and confused. Their initial perceptions of the learning associated with promoting healthy, active lifestyles in PE were at variance with what they experienced in schools during their training. These experiences were diverse, the most common structure being discrete units of study with no health-related learning evident within the rest of the PE programme. The focus of the HRPE learning was predominantly physiological with minimal attention to physical activity recommendations or monitoring. Most students experienced school-based HRPE programmes, which they considered not particularly effective in promoting healthy, active lifestyles amongst young people.

Conclusion: It would seem that PETE is not adequately preparing future PE teachers to promote healthy, active lifestyles and is not addressing previously identified issues in health-related teaching and learning. Changes clearly need to be made to the health-related interactions and experiences within PETE and within any PE, and sports science degree programmes preceding or associated with PETE. PE is unlikely to

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effectively promote healthy, active lifestyles without the health-related aspect of PETE being radically changed, especially and crucially the school-based provision. This requires professionals working together to draw upon and utilise up-to-date health knowledge, as well as the best available guidance on how to ensure that teachers are able to use such information.

Keywords: physical education; teacher education; physical activity; secondary schools; health promotion

Introduction

This paper reports on a study of physical education teacher education (PETE) students' knowledge at the outset of their one-year post-graduate PETE programme about how active young people should be, and their perceptions of the learning associated with promoting healthy, active lifestyles in physical education (PE) and in secondary schools generally. It also reports on PETE students' experiences of school-based health-related physical education (HRPE) programmes and their views on the effectiveness of these programmes in promoting healthy, active lifestyles amongst young people. This information was obtained to inform the development of the university-based health-related exercise (HRE) course within the PETE programme, a key aim of which was to develop a critically reflective approach to the promotion of healthy, active lifestyles in schools. This approach encouraged PETE students to ask questions, weigh up information, establish assumptions and make reasonable judgements (Ryall 2010) about health-related knowledge and its implications for the promotion of active lifestyles.

Previous studies have found worryingly low levels of health-related fitness (HRF) knowledge amongst PETE students (Petersen, Byrne, and Criz 2003; Losch and Strand 2004), which Keating et al. (2009) consider, warrants more attention, due to its possible negative impact on pupils' health-related learning and behaviour. Awareness of PETE students' health-related knowledge and perceptions at the outset of a PETE programme, and their experiences during the programme is considered important in the area of HRPE, as there are high expectations of PE to promote healthy, active lifestyles (United States Department of Health and Human Services 2000; Qualifications and Curriculum Authority 2007).

Despite high expectations, however, international literature reveals a number of problematic issues associated with health-related teaching, learning and professional development in PE. Examples of these issues include:

- Many young people are uninspired by school PE (Lake 2001; Smith and Parr 2007; Trout and Graber 2009) and are confused about health, fitness and activity messages (Harris 1993, 1994; Placek et al. 2001; Stewart and Mitchell 2003; Kulinna 2004; Office for Standards in Education (Ofsted) 2004, 2005; Keating et al. 2009).
- The expression of health in PE is neither universally accepted nor well understood (Harris 1995, 1997), and there is a mismatch between many PE teachers' 'fitness for health' philosophy and their 'fitness for performance' delivery of HRPE (Harris 1995, 1997; Green and Thurston 2002; Leggett 2008; Ward, Cale, and Webb 2008).
- Many PE teachers are in need of professional development in HRPE (Miller and Housner 1998; Cale 2000; Cardon and De Bourdeauhuij 2002; Castelli and Williams 2007), but tend to be overconfident in their knowledge of and ability to teach HRPE (Miller and Housner 1998; Castelli and Williams 2007), and consequently there is limited engagement of PE teachers with HRPE professional development (Armour and Harris 2008; Ward, Cale, and Webb 2008).

This paper aims to provide an insight into PETE students' HRPE knowledge, perceptions and experiences and considers the extent to which this addresses known issues associated with HRPE teaching, learning and professional development. The study adopted a social constructivist perspective which acknowledges the uniqueness and complexity of the learning process, and focuses on how individuals construct and develop knowledge out of their interactions and experiences (Crotty 1998). Within this perspective, PETE offers a context for students to learn about the promotion of active lifestyles in secondary schools through their interactions and experiences during the teacher education process. This study explored the extent to which this process addresses previously identified issues in health-related teaching, learning and professional development. This is considered important, because of the potential for these interactions and experiences to influence the health-related teaching of the PETE students, and to ultimately impact on the health-related knowledge and behaviour of the pupils they go on to teach. Prior to describing the methodology for this study, a summary of the literature associated with the above issues is presented.

Literature review

Young people's views of school physical education and conceptions about health, fitness and activity

Studies on secondary school pupils' views of school PE have revealed some dissatisfaction with the subject (Lake 2001; Smith and Parr 2007; Trout and Graber 2009). For example, Lake (2001) revealed that some pupils disliked PE, because of feelings of incompetence and frustration experienced through sport and competition, and Smith and Parr (2007) found that young people complained about the repetitive nature of skill-based lessons, and that there was a mismatch between PE and current/future leisure activities. Trout and Graber (2009, 285) focused on the PE experiences of overweight adolescents and found these to be mostly negative, with many of them describing their desire to become 'invisible' in PE lessons to avoid being seen by their peers as 'slow', 'weak' or 'unskilled'. All of these studies point towards a need to challenge the privilege afforded to particular modes of participation in school PE and to recognise, and value alternative activities and meanings in order to embrace the needs of more, and ideally, all young people.

Furthermore, young people have been shown to have incomplete and often inaccurate conceptions about health and fitness (Harris 1993, 1994; Placek et al. 2001; Stewart and Mitchell 2003; Kulinna 2004; Ofsted 2004, 2005; Keating et al. 2009). Examples of common misconceptions include: fitness is about looking good and being thin or skinny; a particular exercise can reduce fat in a specific area; sweating will burn off fat; jogging improves strength; exercise involves hard work and being worn out; and there is no gain without pain. Keating et al.'s (2009) review of research on student HRF knowledge revealed the same erroneous fitness conceptions over a 20-year period and concluded that there is a persistent deficiency in fitness education. In England, the PE profession has in the past been criticised by government inspectorate for paying insufficient attention to health and fitness (Ofsted 2004), which is considered to have contributed to weaknesses in many pupils' knowledge and understanding of this area (Ofsted 2005). Ofsted (2009) later acknowledged improvements in PE but recommended the incorporation of more non-traditional activities to motivate hard-to-reach young people, and stated that school PE had yet to have sufficient impact on tackling childhood obesity.

Expression of health in physical education

Harris (1995, 1997) revealed that health promotion as a key goal of PE is neither universally accepted nor well understood and, consequently, HRE means different things to different people. Indeed, studies over time on HRPE teaching and learning in the UK suggest that there continues to be a mismatch between teachers' philosophies and their practices (Harris 1995, 1997; Leggett 2008; Ward, Cale, and Webb 2008) and Green and Thurston (2002) consider that the ideology of sport penetrates deeply into the core assumptions of both PE teachers and government in relation to the promotion of health through PE. For example, Leggett's (2008) study of HRE policy and practice in secondary schools in England and Wales revealed that many PE teachers articulated a 'fitness for life' philosophy, but their delivery of HRE was usually expressed in terms of a 'fitness for performance' discourse, dominated by testing and training. Changing this practice was considered to be complex and challenging due to the ways in which official discourse becomes interpreted and recontextualised within the pedagogical field (Leggett 2008). Concerns about the expression of health within PE were also reported by Ward, Cale, and Webb (2008) who revealed that most PE teachers claimed to value health-related learning, yet some had no written scheme of work outlining the nature and progression of this learning, and most relied on contexts associated with sport and fitness (as opposed to more health and activity-oriented approaches) to deliver it. All of this would suggest that PE teachers' health-related subject knowledge and the application of this in their teaching, may be somewhat limited and in need of development.

Physical education teachers' engagement with professional development in health-related physical education

Indeed, there is evidence that the health-related knowledge base of many PE teachers is inadequate and that they are in need of continuing professional development (CPD) in this area (Miller and Housner 1998; Cale 2000; Cardon and De Bourdeauhuij 2002; Castelli and Williams 2007). This was clearly demonstrated in a study involving teachers taking a cognitive HRF test (designed for students) and a self-efficacy questionnaire in which the vast majority of the teachers thought that they would pass the test, yet only just over a third did so (Castelli and Williams 2007). The researchers were particularly concerned that the deficiencies in HRF knowledge amongst PE teachers substantiated the findings of a study nine years earlier, which revealed the HRF content knowledge of PETE students and experienced PE teachers to be inadequate for effective teaching of HRPE (Miller and Housner 1998). Possible explanations proposed were insufficient and/or ineffective health-related PETE and professional development programmes.

However, despite an identified need for PE teachers to engage in health-related CPD, a national survey in England reported that, for half of secondary school PE teachers, HRE had not been formally addressed within their initial training and over two-thirds had not participated in any HRE-CPD in the previous three years (Ward, Cale, and Webb 2008). This limited engagement with health-related CPD, along with the continued privileging of sport and fitness-related contexts was considered to contribute to less than effective delivery of HRPE (Ward, Cale, and Webb 2008). Furthermore, a national CPD programme in England (Department for Education and Skills (DfES) and Department for Culture, Media and Sport (DCMS) 2003) revealed that the take up of the programme by secondary teachers was disappointingly low overall and 'health-related modules' were not selected by most teachers, who instead targeted modules associated with specific activity areas (e.g. gymnastics and games) (Armour and Harris 2008). This suggests that PE teachers tend

to not recognise their needs in relation to health-related learning – it seems they believe they already know enough about this area and consequently choose not to prioritise it over other aspects of their work. This leads one to wonder where and how PE teachers are to acquire the professional subject knowledge they need, to enable them to teach HRPE effectively.

In summary, the delivery of HRPE in schools is problematic, contributing to some young people being less enthused about being active than they could be, and somewhat confused about health, fitness and activity information. To add to this, most PE teachers tend not to recognise their own or their pupils' needs in this area and consequently do not engage in HRPE-CPD. This suggests that PE is unlikely to promote healthy, active lifestyles effectively unless there are planned interventions in PETE and HRPE-CPD. This study will provide an insight into PETE students' knowledge, perceptions and experiences associated with the promotion of healthy, active lifestyles in secondary schools and will consider the extent to which this addresses the issues identified in this section.

Method

Context

The setting for the study was a one-year full-time post-graduate secondary PETE programme at a university in the Midlands in England, which works in partnership with up to 60 secondary schools. The programme has been consistently judged by government inspectors to be of 'outstanding' quality (Ofsted 2006, 2008, 2011). At the time of data collection, the PETE programme included a HRE component comprising 12 h of lectures which were predominantly practically oriented; half the course (in the form of 3×2 h lectures) was delivered in the first month of the PETE programme (October) and the other half (3×2 h lectures) during the middle of the programme (February). The one-year PETE programme included two teaching practices in different secondary schools, each lasting 11 weeks, one from November to January, and the other from March to May. During these teaching practices, PETE students taught a 60% timetable and were supported by a designated subject mentor and an university tutor.

Participants

All students on the PETE programme during 2006–2007 and 2007–2008 participated in the study, a total of 124 individuals. The 2006–2007 cohort comprises 66 students, 36 females and 28 males (two did not state their gender); of this cohort, 61 were under 25 years of age and 2 were over 25 years (two did not state their age category). The 2007–2008 cohort comprises 58 students, 26 females and 32 males; of this cohort, 52 were under 25 years of age and 5 were over 25 years (1 did not state his/her age category). These data were obtained to help detect any obvious associations between the findings and the different cohorts or the age and gender of the PETE students.

Instrumentation

A questionnaire was designed to explore PETE students': knowledge of how active young people should be; perceptions of the learning associated with promoting healthy, active lifestyles in PE and in schools generally; school-based HRPE experiences; and their views on the effectiveness of this in promoting healthy, active lifestyles amongst young people. The choice of questions was influenced by a desire to establish PETE students' knowledge about well-established activity recommendations (Biddle, Sallis, and Cavill 1998), which

arguably are fundamental to the promotion of active lifestyles, and could reasonably be expected to be included in school curricula and/or university degree courses associated with or leading on to PETE programmes. In addition, there was an interest in exploring what PETE students thought schools and PE, in particular, could do to help promote active lifestyles amongst young people. This permitted a comparison with what they actually experienced in PE during their teaching practices in the schools. The data were obtained to aid the development of the HRE course within the PETE programme.

The questionnaire included demographic data relating to gender and age (under or over 25 years). The first section of the questionnaire comprised the following three questions:

- How active should children and young people be?
- What can pupils learn in PE to help promote healthy, active lifestyles?
- In addition to the learning in PE, what else can schools do to promote healthy, active lifestyles?

The second section of the questionnaire required the PETE students to respond to the following statements in relation to the PE curriculum at a secondary school in which they had just spent 11 weeks teaching practice:

- Briefly describe the approach to, content and delivery, of the ‘health and fitness’ aspect of the PE curriculum.
- Please comment on your view of the effectiveness of the above in terms of promoting healthy, active lifestyles.

The first part of the questionnaire was completed by 66 PETE students from the 2006–2007 cohort and 58 from the 2007–2008 cohort, and the second part by 60 and 55 students from the 2006–2007 and 2007–2008 cohorts, respectively.

Data collection

In the second week of the university-based PETE programme, the PETE students completed the first section of the questionnaire at the start of their first HRE lecture, prior to any input from the lecturer. The second section of the questionnaire was completed at the beginning of a HRE lecture delivered half-way through the PETE programme, immediately following completion of an 11-week teaching practice. It was explained to the PETE students that the questionnaire contributed to a research project, the findings of which would be used to develop the HRE component of the PETE programme. They were informed that they could choose to exclude their data from the research project, at any time during the PETE programme, and that this would in no way affect their performance on the programme. All of the PETE students volunteered to take part in the study and none requested for their data to be excluded. The questionnaires were anonymous and the research design and protocol followed the university’s ethical guidelines.

Data analysis

Responses to the open-ended questions were analysed by means of the generation of themes using constructivist grounded theory methods (Charmaz 2000). The first stage of the analysis involved highlighting keywords and phrases within the responses, the second stage involved coding and grouping these into related issues, and the third stage was the

Table 1. Samples of each stage of the data analysis process.

Question: How active should children and young people be?	
Stage of data analysis process	Examples
(1) Keywords and phrases	<ul style="list-style-type: none"> • '3 × 30 min exercise periods'; 'as active as possible'; 'a few times a week but only at a moderate intensity'; '60 min of vigorous exercise'; 'some sort of physical activity every day' • 'Should try to include some type of strength building activities'; 'twice a week strength'; 'twice a week, they should engage in activities that promote bone health, strength and flexibility' but overall few explicit references to strength/flexibility • '30 min, five times a week'; '2 h per week in school and 2–3 h outside school'; '2 h school PE plus 3 × 30 min per week'; '2 h exercise a week'
(2) Issues arising from coding and grouping of keywords and phrases	<ul style="list-style-type: none"> • Inaccuracy of most responses • Incomplete responses • Confusion with other recommendations
(3) Emerging themes identified from issues	<ul style="list-style-type: none"> • Lack of knowledge of physical activity recommendation for young people • Limited attention to physical activity to develop strength and flexibility • Degree of confusion with physical activity recommendation for adults and with government target

identification of emerging categories and themes (Ritchie and Lewis 2003) to assist the evolution and development of theory (Charmaz 2000). Samples of each stage of the data analysis process are presented in Table 1.

Constant comparison of new and emerging data was used to explore how the data added to or changed the patterns of existing information. The worthiness of the data was established by cross-checking themes and categories emerging from the data and through the use of peer debriefing to assist with evaluating the quality of the assertions made by the researcher (Patton 2002).

Results

The data are reported in terms of PETE students': knowledge of how active young people should be; perceptions of the learning associated with promoting healthy, active lifestyles in PE and in schools generally; school-based HRPE experiences; and views on the effectiveness of these in promoting healthy, active lifestyles amongst young people.

Physical education teacher education students' knowledge of how active young people should be

None of the PETE students in either the 2006–2007 or 2007–2007 cohort accurately recorded the physical activity recommendation for young people in England (Biddle, Sallis, and Cavill 1998), and only a minority (approximately a sixth) gave partially correct responses. The responses revealed some confusion with other physical activity recommendations and targets; for example, over a third of the PETE students considered that children should be active for 30 min, 5 days a week which is similar to the physical activity

recommendation for adults in England (Health Education Authority 1994), and between a quarter and a third of the students referred to children being active for 2 h a week, which is similar to a government target in England of a minimum of 2 h each week of high quality PE and school sport within and beyond the curriculum (DfES and DCMS 2003). A significant minority (15–20%) gave imprecise responses, such as: ‘some sort of physical activity every day’, ‘as active as possible’ and ‘very active . . . but not too active’. The responses also revealed limited attention to physical activity to develop strength and flexibility with less than 10% of the PETE students making explicit references to this.

Three main themes emerged about PETE students’ knowledge of how active young people should be, these being:

- (1) Lack of knowledge of the precise physical activity recommendation for children and young people in England.
- (2) Limited attention to physical activity to develop strength and flexibility.
- (3) A degree of confusion with the physical activity recommendation for adults and with a government target in England of a minimum of 2 h of physical activity per week in school, within and beyond the curriculum.

Physical education teacher education students’ perceptions of the learning associated with promoting healthy, active lifestyles in physical education and in schools generally

The vast majority (over two-thirds) of the PETE students considered that the ‘benefits of activity and the consequences of inactivity/sedentary living’ should be taught in PE to help promote healthy, active lifestyles, and approximately half thought that ‘diet/nutrition/healthy eating’ should also be included. A significant proportion of the students (a quarter to a third) stated that ‘a focus on active living/healthy lifestyles’, ‘experience of a variety of physical activities’ and ‘enjoyment/fun of the physical activities’ should be features of school PE to help promote active lifestyles. Approximately one-fifth of the students made reference to the ‘development of physical competence/skills’ to help promote active lifestyles, whilst a minority (a sixth or less) mentioned ‘exercising safely’ and ‘physical activity recommendations’. There were no references to ‘fitness education’ or ‘fitness testing’ in PE to help promote active lifestyles. The three main themes in terms of PETE students’ perceptions of the possible learning associated with promoting healthy, active lifestyles in PE were:

- (1) The prominence of the benefits of physical activity to health (especially ‘physical health’) and diet/nutrition/healthy eating.
- (2) Lifestyle-oriented approaches emphasising enjoyment and fun through a variety of activities.
- (3) Limited attention to physical activity recommendations and no mention of fitness/fitness testing.

The vast majority (over two-thirds) of the PETE students considered that schools could promote healthy, active lifestyles by ‘providing healthy food and educating about healthy eating’ and ‘offering a range of extra-curricular physical activities’. Approximately a quarter of the students thought that schools should encourage active transport between home and school, and a quarter to a sixth of them emphasised the importance of ‘educating about healthy lifestyles through healthy/active weeks/events/talks’ and ‘developing links with sports clubs’. Approximately one-fifth of the students made reference to the

‘development of physical competence/skills’ and ‘the inclusion of some physical activity in non-PE lessons’, and a minority (a sixth or less) mentioned ‘providing drinking water’, ‘being healthy role models’ and ‘liaising with parents’ in terms of schools’ promotion of active lifestyles. Three main findings emerged in terms of what PETE students consider that schools can do to promote healthy, active lifestyles, these being:

- (1) An emphasis on healthy food/eating.
- (2) Offering a range of extra-curricular physical activities, encouraging active transportation to and from school, and developing/encouraging links with sports clubs.
- (3) Educating about healthy lifestyles.

Physical education teacher education students’ school-based health-related physical education experiences

The vast majority (over two-thirds) of the PETE students experienced HRPE in schools in the form of discrete units of study with no obvious health-related learning within other areas of the PE programme. A quarter of the students experienced the delivery of health-related learning through a combination of discrete units of study and via other areas of the PE programme, and a small minority (<10%) experienced health-related learning delivered solely through the usual PE programme. A few students experienced no explicit health-related learning in PE, and some described approaches in which HRPE was taught through subjects, such as ‘citizenship’ or ‘health’. Two main themes emerged in terms of PETE students’ school-based HRPE experiences, these being:

- (1) The most common experience was of discrete units of study with no health-related learning evident within the rest of the PE programme.
- (2) The approaches to HRPE were diverse and varied, ranging from highly structured units of study to none at all.

The most frequently cited activities and topics within the school-based HRPE experienced by the PETE students were: ‘fitness/fitness testing’ (vast majority – over two-thirds), ‘circuits’ (majority – 60–65%), ‘aerobics’ and the ‘benefits of exercise’ (a third), ‘heart rate’ (a seventh to a fifth), ‘principles of training’ and ‘warming up and/or cooling down’ (a minority – 10%), ‘personal exercise programmes’, ‘breathing rate’, ‘cardiovascular fitness’ and ‘rowing’ (a small minority – <10%). The content was delivered through thematic units of study (with titles such as ‘Fitness’, ‘Heart Health’ and ‘Fitness for Life’) or through fitness-related activities (such as circuits and aerobics). In some schools, these were delivered in specific facilities (e.g. a fitness suite or multi-gym) and/or with specific equipment (e.g. rowing machines).

Only a few students referred to ‘food’/‘energy balance’ and ‘monitoring physical activity levels’ being included in the content and none of the students referred to physical activity recommendations. A small minority of students (<10%) stated that the content and depth of knowledge varied, depending on the teacher delivering it. Three students from each cohort commented upon gender-differentiated HRPE, with one stating: ‘The boys’ focus was extremely fitness-based and taught aggressively. Girls mainly focused upon engaging in physical activity such as aerobics’ and another stating: ‘Boys’ groups focus on circuit training/bleep test/abdominal test. Girls’ groups focus on aerobics, circuits and interval training’.

Three main themes emerged in terms of the content of the PETE students' school-based HRPE experiences, these being:

- (1) The focus was predominantly physiological and was delivered through thematic units of study and/or fitness-related activities, some utilising specific facilities/equipment.
- (2) There was minimal attention to food/eating/energy balance, monitoring physical activity levels, or physical activity recommendations.
- (3) Some gender differences were evident in the HRPE content/delivery.

Physical education teacher education students' views on the effectiveness of the school-based health-related physical education in promoting healthy, active lifestyles amongst young people

Approximately a third of the PETE students experienced what they described as 'effective' school-based HRE programmes (e.g. 'Most pupils enjoyed the activities and learnt a great deal regarding the short-term effects of exercise and the health benefits'), close on a third experienced programmes considered to be 'ineffective' (e.g. 'The approach seemed somewhat unclear and seemed to be an ad hoc addition to the timetable'), and a fifth to a quarter described programmes with a mixture of positive and negative features (e.g. 'Effective through circuit-training but not very effective through other activities, I feel it would be better to have separate HRE modules').

A range of reasons were given for the school-based HRPE being considered effective, including: the explicit focus on health/fitness; the emphasis on healthy, active lifestyles; the focus on 'variety' and 'fun'; pupils liking the activities and discovering new activities; and the content linking well with activities outside of school and relating closely to the pupils' lives. In contrast, school-based HRPE was considered ineffective for the following reasons: it was not seen as important; the health-related content was 'mixed up with and lost' amongst the teaching of skills; nothing was delivered in detail; there was no learning or no progression in the learning; there was no explanation of the health benefits of exercise or information about active lifestyles; and pupils were bored by, or disliked, the content. There was a diverse range of experience from that described as: 'Very effective; very structured; taken seriously; well taught; backed up by the school' to 'very poor; almost non-existent; rubbish; there was no scheme of work so individual teachers decided lesson content which was often low quality and really just entailed anything that filled the lesson'.

Gender-differentiated school-based HRPE was commented upon by a small minority of students, with one stating: 'the effectiveness was rubbish as boys only do circuit-training and multi-gym – girls should do a module too, rather than just "wet weather" circuits' and 'The male side of health and fitness was pretty scarce'. Three main themes emerged in terms of PETE students' views on the effectiveness of the school-based HRE they experienced, these being:

- (1) Approximately a third experienced what they described as 'effective' HRPE and close on a third experienced 'ineffective' HRPE.
- (2) There was a diverse range in the perceived effectiveness of the school-based HRE experienced.
- (3) Gender differences were evident in the school-based HRE delivered in some schools.

The social constructionist approach to the data analysis revealed no obvious associations between the findings and the different cohorts or the age and gender of the PETE students.

Discussion

The PETE students' lack of knowledge of the precise physical activity recommendation for young people is somewhat alarming and adds weight to the findings from previous research that there is inadequate HRF knowledge amongst students at all educational levels (Keating et al. 2009), including PETE students (Petersen, Byrne, and Criz 2003; Losch and Strand 2004). The PETE students' confusion with the physical activity recommendation for adults and the government's physical activity target for schools in England is also a concern as both of the latter fall well short of the daily physical activity recommendation for children and young people. It also points to the potential confusion arising from multiple recommendations from various agencies. It is, therefore, recommended that PE and/or sports science degree programmes preceding or associated with teacher education include a critique of physical activity recommendations for different age groups and settings, and that PETE programmes address the pedagogical implications of these recommendations.

PETE students' views that PE's role in promoting active lifestyles, can be fulfilled through teaching the benefits of exercise via lifestyle-oriented approaches, emphasising enjoyment and fun of a variety of activities is interesting and, arguably, encouraging. What is surprising though is the prominence of 'diet/nutrition/healthy eating' as a topic of learning within PE, as it is clearly at variance with what the PETE students actually experienced in the HRPE curricula of their teaching practice schools. Indeed, it leads one to question whether PE should include this content, or even whether physical educators are best placed to impart this learning? O'Dea (2005) reminds teachers that a key principle is 'to do no harm' and Cale and Harris (2011) recommend that PE teachers carefully consider the judgments and comments they make about food, and that they work collaboratively with other subject staff to ensure that consistent messages are promoted about the contribution of physical activity to healthy weight management.

It is disappointing that few PETE students referred to teaching pupils about physical activity recommendations in PE, especially as these recommendations have been in existence for well over a decade (Biddle, Sallis, and Cavill 1998), and one wonders where else young people would learn this. This finding may be influenced by the PETE students' lack of knowledge of the recommendation and also the competitive performance-oriented nature of PE which has tended to take precedence over the subject's role in promoting lifelong participation in physical activity (Green 2002).

PETE students' views that schools can promote healthy, active lifestyles by ensuring that pupils eat healthy food, learn about healthy living, and have access to a range of physical activity opportunities is in line with recommended whole school approaches to health (Department for Education 2011). The emphasis on healthy eating is probably due to the increased attention to rising obesity levels and warnings of an obesity epidemic and impending global obesity crisis (World Health Organisation 2011), despite concerns expressed by some (Gard and Wright 2005; Evans et al. 2008) that the discourse surrounding obesity and some of the reports, policies and measures being taken to tackle obesity, including in schools, are misleading, misguided and could do more harm than good. The focus on physical activity provision beyond PE is likely associated with the English government's PE and school sport strategy of the time, the purpose of which was to improve

a range of issues associated with attendance, behaviour, attainment, obesity and success in international competition (DfES and DCMS 2003).

The finding that most PETE students' experiences of school-based HRE were of discrete units of study with no health-related learning evident within the rest of the PE programme is somewhat at odds with previous research by Harris (1995, 1997) and Cale (2000), which revealed that a combination of approaches (e.g. focused units of work in PE, integration through activity areas (such as athletics, gymnastics, games), and delivery within other areas of the curriculum) was the most common mode of delivery. The discrepancy in the findings may be that, whilst the teachers in Harris' (1995, 1997) and Cale's (2000) studies reported that health-related learning was planned to be delivered through PE activity areas, this may not have been occurring in practice to the extent that it was planned to, as was found by Curtner-Smith, Kerr, and Clapp (1996). In other words, PE teachers' intentions and actions may not always match up.

Harris' (2000) critique of health-related learning in PE points to the potential for focused/discrete approaches by themselves to result in learning which is disconnected to pupils' experiences in most PE lessons. She does, however, make the point that the critical issue is the effectiveness of the learning rather than the particular approach adopted. However, in this study, close on a third of the PETE students experienced what they described as 'ineffective' HRPE which would suggest that the approaches adopted by many of the teaching practice schools were not necessarily meeting the needs of their pupils.

Whilst it is reassuring that some PETE students experienced highly structured approaches to health-related learning in PE in their teaching practice schools, it is also worrying that some came across what has been described in the literature as 'ad hoc, hit and miss' approaches (Harris 2000), and it begs the question as to whether this is acceptable for schools involved in PETE programmes? Further, given that the majority of the PETE students did not experience 'effective' HRPE, this is clearly not good grounding for their future teaching of HRPE. One would expect that HRPE programmes in schools, especially those involved in PETE programmes, would be described as at least 'effective'. Ineffective programmes are unlikely to address young people's dissatisfaction with PE (Lake 2001; Smith and Parr 2007) or their incomplete and/or inaccurate conceptions about health and fitness (Harris 1993, 1994; Placek et al. 2001; Stewart and Mitchell 2003; Kulinna 2004; Ofsted 2004, 2005; Keating et al. 2009) or impact on childhood obesity (Ofsted 2009).

The HRPE experienced by the PETE students focused on physiological content (e.g. fitness; the physical benefits of exercise; heart rate; principles of training) taught through activity-focused (e.g. circuits and aerobics) or thematic units of study (e.g. 'Fitness', 'Heart Health' and 'Fitness for Life'), which is similar to that found in previous studies (Harris 1997; Cale 2000; Ward, Cale, and Webb 2008). This is somewhat disappointing though given calls for HRPE to embrace the psycho-social effects of exercise and to adopt a behavioural approach (Harris 2000). It is interesting that the PETE students' experiences of HRPE were at odds with their earlier perceptions of the learning that could be taught in PE to promote healthy, active lifestyles. For example, fitness and fitness testing featured heavily in their school-based experiences, but did not feature at all in their notions of activity-promoting learning in PE. It is also noted that physical activity recommendations and monitoring of physical activity levels were rare or even absent from the HRPE experienced. It could be argued that all of this reflects the persistent and continuing dominance of the 'fitness for performance' discourse within HRPE (Harris 1995, 1997; Leggett 2008; Ward, Cale, and Webb 2008). School PE is unlikely to have a significant impact on the physical activity levels of young people unless it explicitly includes education

about physical activity behaviour and monitors this to develop awareness and encourage desirable levels of activity for health.

The evidence of gender-differentiated HRPE in some schools is consistent with the findings of a previous study (Harris and Penney 2000) and warrants further investigation to ensure that boys and girls are not being excluded from key aspects and contexts of health-related learning. The less than effective HRPE witnessed in the schools and the reported degree of variation in PE teachers' health-related knowledge and practice, serves to reinforce the previously identified need for HRE-CPD (Miller and Housner 1998; Cale 2000; Cardon and De Bourdeauhuj 2002; Castelli and Williams 2007), but does not address the issue of PE teachers not recognising these needs. However, calls for PE teachers to have greater accountability for children's activity-related knowledge and behaviour in the school setting (Armour and Harris 2008) may result in teachers being prompted to identify the activity needs of their pupils and to then seek appropriate forms of HRE-CPD to help meet these needs.

A number of limitations of this study are acknowledged, the first being that it was based on one particular PETE provider in England so generalising the findings across other, especially different types of, PETE providers is problematic. Secondly, the information about the school experiences is based solely on data from PETE students and was not validated via other methods, such as analysis of school documentation, interviews with teachers and/or pupils, or observations of HRPE lessons. Thirdly, it is possible that the PETE students mainly reported what they had experienced during their 11-week teaching practice, rather than the full HRPE programme delivered to the pupils throughout the year. Fourthly, PETE students who are only half-way through their programme, may not be best placed to make accurate judgements about the effectiveness of school-based HRPE programmes. Despite these limitations, this study may be considered a useful foundation for further research on the promotion of healthy, active lifestyles in schools.

Conclusions

This paper aimed to provide an insight into students' HRPE knowledge, perceptions and experiences during a one-year post-graduate PETE programme and to consider the extent to which this addresses issues associated with HRPE teaching, learning and professional development. The findings revealed that at the outset of their programme, PETE students' knowledge of how active children should be was limited and confused. In addition, their initial perceptions of the learning associated with promoting healthy, active lifestyles in PE were at variance with what they experienced in schools during their training. These experiences were diverse, the most common structure being discrete units of study with no health-related learning evident within the rest of the PE programme. The focus of the HRPE learning was predominantly physiological with minimal attention to physical activity recommendations or monitoring. Most students experienced school-based HRPE programmes, which they considered not particularly effective in promoting healthy, active lifestyles amongst young people.

In keeping with a social constructivist perspective, in which PETE students construct and develop knowledge about the promotion of active lifestyles in secondary schools during the teacher education process, it is suggested that changes clearly need to be made to the health-related interactions and experiences within PETE and within any PE and sports science degree programmes preceeding or associated with PETE. Currently, it would seem that PETE is not adequately addressing previously identified issues in health-related teaching and learning. It is concluded that PE is unlikely to effectively

promote healthy, active lifestyles without the health-related aspect of PETE being radically changed, especially and crucially the school-based provision. This requires professionals working together to draw upon and utilise up-to-date health knowledge, as well as the best available guidance on how to ensure that teachers are able to use such information (Armour and Harris 2008).

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