

revealing pupils to have predominantly corporeal notions of health, narrow view of what it means to be 'healthy' (focused on diet and exercise as key moderators of health), and a tendency to describe health in negative terms, explicating *what not to do* to be 'healthy', rather than *what to do* (*ibid*). In summarising the body of research in this area, Harris et al. (2018) concluded that pupils have reductive, limited and limiting conceptions of health.

As research around pupils' knowledge and understandings has advanced, increased attention has been paid to how pupils come to learn about the concepts of health, fitness and physical activity and the sources of information they draw upon. On this, and in accordance with the point made earlier, Burrows and Wright (2010) suggest that pupils' knowledge and understandings of health, fitness and physical activity are reflections of the narrow and somewhat limited teaching taking place within schools, influenced by wider societal messages around public health, which in turn are often influenced by healthist discourses. Meanwhile, Harris et al. (2018) and Hooper, Harris and Cale (2017a, 2017b) note how pupils receive health-related information from a range of sources and report difficulty in making sense of this, particularly where it is contrasting or conflicting. Evidently, this highlights the need to consider approaches to the delivery of health which might better facilitate health-related learning within PE in the broadest sense.

Health approaches and pedagogies in physical education

As already alluded to, if health policy and curricular expectations are to be effectively realised in PE, then health needs to be afforded adequate status and prominence and its content, organisation and delivery need to be appropriate, sufficiently broad and explicit. With regard to delivery, there are some general principles which should be applied (Cale and Harris, 2018). First, PE is, by definition, concerned with the physical and as such health knowledge and skills should be developed within and through the physical, and via active participation in a range of activities. Evidence suggests, however, that this is not always the case, with classroom-based delivery of health and health-related concepts and information often reported (Cale, 2017; Cale and Harris, 2006). This is despite it being found to be relatively ineffective (Cale and Harris, 2006) and limited by its sedentary and didactic nature, thereby reducing the potential both for active time and for learning about health via a combination of understanding, experiencing, decision making and evaluating (Cale, 2017; Cale and Harris, 2013). Rather, learning about health through active participation is in keeping with the physical context of the subject, is associated with physical activity for health recommendations and public health messages, and helps to contribute to young people's overall physical activity levels (Harris, 2000; Harris and Cale, 2018).

Other principles which are fundamental to health in PE, and arguably to high-quality teaching in general, are the inclusion and empowerment of all

pupils, and their subsequent and gradual shift from dependence on the teacher to independence (Cale and Harris, 2018). As noted earlier, providing positive, relevant and meaningful physical activity experiences is key to facilitating and achieving active lifestyles amongst young people. This also needs to involve recognition of the diverse physical activity needs of young people and planning appropriately to meet them. Indeed, three core elements have been identified as important to the empowerment of young people with respect to healthy, active lifestyles, namely: appropriate content, appropriate context and effective pedagogy (Elbourn and James, 2013). Appropriate content is safe, progressive, relevant, well informed, inclusive and fun, whilst appropriate context relates to the range of activities through which healthy, active lifestyles can be promoted, for instance, via a variety of games, dance, gymnastics and exercise activities. Effective health pedagogy meanwhile is characterised by being 'personalised, enabling and collaborative' plus pedagogy which 'facilitates informed decision making' and 'uses active learning strategies' (Elbourn and James, 2013, p. 2).

A range of approaches can be used to incorporate health within the curriculum which equally have been the subject of much debate and critique over the years (Cale and Harris, 2005, 2009, 2013; Murdoch and Whitehead, 2010). For example, health can be permeated through core PE activities such as athletics, dance, games, gymnastics, outdoor education and swimming, or taught in discrete, separate health-related units of work. The strengths of the permeated approach are that health knowledge, understanding and skills can be seen as integral to all PE experiences, with young people learning that all physical activities can contribute towards health, thus endorsing the close relationship between health issues and participation (Harris, 2000; Murdoch and Whitehead, 2010). However, a major limitation of the approach is that it can be rather 'ad hoc', 'piecemeal' and 'hit and miss' (Harris, 2000, p. 168) and may result in health-related learning becoming 'lost' or marginalised and taking second place to other learning such as skill development or tactical understanding (Cale and Harris 2005; Harris and Cale, 2018). Furthermore, much liaison activity is required to ensure consistent delivery and messages and the approach may deny pupils the opportunity to engage in a variety of popular health-promoting lifetime activities (Fox and Harris, 2003). The discrete approach avoids these issues, but a drawback in teaching health in isolation is that it may not be seen to relate closely to other learning and elements of PE and other curriculum subjects (Harris and Cale, 2018; Murdoch and Whitehead, 2010). On balance, a combined approach is advocated in that it builds on the strengths of each, helps to reinforce and ensure the consistency and coherence of learning, and provides a realistic opportunity to more adequately address the required knowledge base (Cale and Harris, 2009). It is suggested this approach also places value on the area and allows links to be made to other PE and physical activity experiences and health behaviours as well as subjects such as personal, social and health education (PSHE), science and food technology (Harris and Cale, 2018). Cale and Harris (2013) contest though that more important than the particular approach adopted is the effectiveness of its delivery.

Yet, with regard to the above, it has been argued that teachers lack appropriate pedagogies for effectively delivering the area (Armour and Harris, 2013). Despite interest in health-focused curriculum activities and interventions, Armour and Harris (2013) claim less attention has been afforded to the development of pedagogies to be used in the health dimension of PE (or PE-for-health pedagogies) and which might enable the profession to make a more robust contribution to policy and practice in the area. Indeed, knowledge about effective PE-for-health pedagogies or models has been identified as a significant gap in the field, with calls having been made for alternative methods, strategies or models to teach health-related knowledge (Armour and Harris, 2013; Haerens et al., 2011; Hastie, Chen and Guarino, 2017; Hodges et al., 2016). Armour and Harris (2013) furthermore argue that the traditional approach to the area has been for the curriculum, programmes and activities to drive the educational process but contend that effective PE-for-health pedagogies should place the pedagogical encounter and the needs of the learners at the core. To this end, there have been some recent and encouraging pedagogical developments in this area within and beyond the UK, a few examples of which are now outlined.

Specific approaches and models

The Health-Based Physical Education (HBPE) Model has as its central theme ‘pupils valuing a physically active life, so that they learn to value and practice appropriate physical activities that enhance health and well-being for the rest of their lives’ (Haerens et al., 2011, p. 321). The model draws on self-determination theory, the social ecological model and theories of behaviour change and identifies four goals for HBPE including the characteristics of habitual, motivated, informed and critical ‘movers’. The affective domain is prominent in planning for learning, emphasising the importance of valuing a physically active life as a sustainable long-term process, knowledge as a significant component, and focusing beyond the individual to the wider community. In this respect, and whilst intended to be used flexibly to inform learning outcomes and the delivery of health knowledge and content, the model proposes that:

- Pupils’ psychological needs for autonomy, competence and relatedness should be prioritised;
- Teachers promote physical activity within and beyond lessons, maximising lesson opportunities and interacting with parents and community bodies;
- Lessons include physical activity learning opportunities, such as current guidelines, age-related statistics, local opportunities and safe/effective practice;
- Pupils understand physical activity barriers, potential strategies to overcome these and become movement activists for their peers/family (Bowler et al., 2012).

Since 2011, this model has undergone a comprehensive process of development with teachers, teacher educators and pupils resulting in some positive outcomes for those involved (Bowler et al., 2012, 2015).

A second pedagogical approach to promoting knowledge and understanding of health, the Promoting Active Lifestyle (PAL) Principles (Harris and Cale, 2018; Harris, Cale and Hooper, 2017), emanated from a small-scale action research study. The aim was to develop and trial a principle-based approach to promoting active lifestyles which could inform policies, delivery and resources suitable for use by teachers and schools. Informed by the literature and underpinned by social cognitive theory and the social ecological model, experienced and trainee teachers were involved in developing, trialling, evaluating and agreeing a number of whole-school and PE-specific PAL principles, some of which explicitly focus on the development of knowledge and understanding in this area. Key considerations in the design and implementation of the Principles were ensuring their flexibility, simplicity, accessibility and sustainability. Thus, there are no rigid rules and no prescriptive or structured programme for teachers to follow in incorporating them and minimal training and limited resources are needed to do so. The findings from the study were encouraging revealing changes in teachers' pedagogies, increased activity levels and positive responses from pupils (Cale, Harris and Hooper, 2017; Harris, Cale and Hooper, 2017).

Examples of whole-school PAL Principles which require and involve the development of appropriate knowledge and understanding are: including the physical activity for health guidelines for children in the teaching of PSHE as well as in PE; discussing the promotion of active lifestyles, including promoting the 'one hour a day' physical activity guideline with all staff, governors, pupils and parents/carers; promoting active travel to school (cycling, walking, scooting) and ensuring the safe storage of cycles/scooters; and developing good community links (e.g. with feeder/partner schools, local sports clubs) to increase the quality and quantity of physical activity opportunities available to pupils (Harris et al., 2016, p. 52).

Likewise, relevant examples of PE PAL Principles include: teaching pupils about the broad range of physical, psychological and social benefits of a healthy, active lifestyle; including assessment of learning and pupil progress in active ways (e.g. show me...; demonstrate...; shadow...); routinely informing pupils where they can be active within three to five miles of the school; and teaching pupils how active they should be, involving them in monitoring their own activity levels so they are aware of how active they are, and informing them of ways to increase their activity levels (Harris et al., 2016, p. 52).

The Project-Based Learning (PBL) Model (Hastie, Chen and Guarino, 2017) represents another approach to teaching health-related knowledge. Hastie and colleagues (2017) implemented the model during an 18-lesson unit. The 'project' required students to plan a series of exercise stations and create three fitness trails (aerobic, muscular strength/endurance and core strength and flexibility) with the teacher providing in-class fitness education and facilitating the design of

the trails. Seven essential elements of meaningful projects identified by Larmer and Mergendoller (2010, cited in Hastie, Chen and Guarino (2017)) were adhered to, these being: a need to know, a driving question, student voice and choice, twenty-first century skills, inquiry and innovation, feedback and revision, and a publicly presented project. The unit was found to be effective in enhancing students' fitness knowledge and PBL was therefore advocated as an alternative approach to teaching meaningful fitness education, particularly for primary school children (Hastie, Chen and Guarino, 2017).

Each of the above approaches is innovative and different in its own right and studies on each have, to date, resulted in positive outcomes for teachers and pupils. This is promising and illustrates the potential of such approaches and pedagogies to impact on young people's health knowledge and physical activity behaviours. Teachers should therefore be encouraged to experiment with similar as well as further pedagogical approaches in order to enhance their delivery of health and ultimately effectiveness in promoting healthy, active lifestyles.

Finally, and mindful of the pace of technological advances in contemporary society, it would be remiss not to consider the influence of technology in the development of health knowledge and pedagogies. In recent years, there has been a rapid growth in both the availability and application of digital technologies within PE (Casey, Goodyear and Armour, 2017) and, increasingly, these digital technologies are being used for the purposes of health-related teaching and learning within the subject (Gard, 2014). Examples include exergames (Francombe-Webb, 2016; Ohman et al., 2014), apps and wearables (Goodyear, Kerner and Quennerstedt 2017; Rich and Miah, 2017). The integration of these technologies is typically justified by the potential they are assumed to have to promote health, with studies suggesting that they can increase physical activity levels, enhance perceptions of body image and improve dietary behaviours (Dennison et al., 2013; Dute, Bemelmans and Breda, 2016).

However, despite the potential benefits digital technologies may offer in this regard, concerns have been expressed over the potentially negative impact they might have on teaching practice, pupil learning and pupil well-being. Indeed, preliminary findings from the PAL project suggest that whilst PE teachers are interested in the use of technology to enhance both the emphasis on and interest in health-related knowledge and behaviour amongst their pupils, they are equally mindful that technology can be limiting and can reduce physical activity levels. This represents somewhat of a dilemma. Currently for many of these teachers their search for pedagogically appropriate technology to enhance teaching and learning is also proving time-consuming and frustrating.

A particular concern with such technologies is their tendency to 'quantify' health-related learning, for example, by measuring and ranking pupils in terms of physical activity levels. As Goodyear, Kerner and Quennerstedt (2017, p. 2) note, this could lead to health-related learning 'becoming a practice of being told, adopting and repeating easily described behaviours', such as exercising for 60 minutes per day at moderate to vigorous intensity. This is problematic