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Didactics of health in physical education – a review of literature

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ABSTRACT

Background: In recent years there has been an increasing amount of research focusing on health in physical education (PE). Much of this research includes discussions on different approaches to health and these have different understandings on how health should be valued in PE. There is less research focusing on how to teach health, but there are reasons to believe that different approaches of health will produce different approaches to teaching.

Purpose and research design: The aim of this paper is to review the literature in order to investigate how health is taught in PE. The literature search was based on three different databases, SportDiscuss, ERIC and ISI Web of Science. We found 1903 articles, but after the exclusion process we ended up with 30. The didactic triangle (Gundem 2011) is used as a theoretical framework in order to analyze the literature.

Findings: The analyses show that in the biomedical and alternative perspectives on health there are clear differences between how health is presented to students, what students learn, and differences between teacher and students' roles in practice. The study finds that different perspectives on health emphasize different ways of teaching health in PE.

Conclusion: In this review we have investigated the didactical implications of different approach to health in PE. By employing a didactical approach, we have been able to discern certain differences in how the biomedical and alternative approaches see the content of health in PE, as well as the roles of the teacher and the students respectively.

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Physical education; teaching; health; pedagogy

Introduction

In recent years an increasing amount of research focusing on different aspects of health in physical education (PE) has been published (e.g. Cale and Harris 2013; Cale, Harris, and Chen 2014; Fitzpatrick and Burrows 2017; Kilgour et al. 2015; Svendsen 2014). Indeed, health promotion and prevention of disease and ill-health have been enduring arguments for legitimizing PE as a school subject. Even though physical activity is one of the characteristics of PE (Penney and Chandler 2000), one line of research (Fardy, Azzollini, and Herman 2004; Sallis and McKenzie 1991; Trost 2004) considers PE as a subject that does not utilize its potential to provide students with the opportunity to be physically active during the school day. These researchers argue that PE should focus more on the health benefits of physical activity. For instance, growing concern about childhood obesity and sedentary behavior in the population has been advanced as an argument for why health merits more attention in the subject (McKenzie et al. 2000; Sallis and McKenzie 1991; Trost 2004).

Increased levels and intensity of physical activity are then seen as a way to develop good health and to prevent lifestyle diseases in PE (McKenzie, Sallis, and Rosengard 2009; McKenzie et al. 2016).

Another line of research criticize the very idea of an obesity crisis (Evans 2003; Gard and Wright 2001; Kirk 2006) and questions whether PE as a school subject can deliver the promises of improved health to children and young people. These researchers warn against the so-called healthism ideology. Robert Crawford (1980) described healthism as a moral and individualistic ideology where 'health can be achieved unproblematically through individual effort and discipline, directed mainly at regulating the size and shape of the body' (Kirk and Colquhoun 1989, 419). The triplex exercise = fitness = health is another relevant aspect in this ideology (Kirk and Colquhoun 1989). This triplex reveals a strong relationship between these components and presents an implicit belief that exercise through fitness leads to health, that exercise is essential to health, and that being fit and having a slender body is proof of health (Kirk and Colquhoun 1989, 426). According to critical PE scholars, this line of reasoning reproduces a narrow understanding of health and ignores how politics, education, environment and different social contexts impact people's health.

As an alternative to the 'healthism' of the public health agenda, some researchers present a view where health in PE is given more of an educational focus (Dowling 2010; Evans, Rich, and Davies 2004; Kirk 2006, 2010; Quennerstedt 2008). That is, health should be considered a knowledge object in PE, something the students should know something *about*. Some countries have changed the name of the subject from Physical Education to Physical Education and Health (Sweden) or Health and Physical Education (Australia). This change of name makes the point that the subject is more than sports, and that health is emphasized more in the curriculum than previously. However, there is dearth of literature examining the pedagogical and didactical implications of different approach to health in PE. We think there are reasons to believe that different understandings of health will affect the understandings of what health is and, consequently, will result in different pedagogical implications for what is being taught (Armour and Harris 2013; Quennerstedt 2008). Therefore, this paper is based on a literature review that investigates how health is thought to be taught in PE and asks if different understandings of health have any impact on how health is taught.

Theoretical framework

In order to facilitate the analysis of the literature, we draw on the didactical tradition. A broad definition of didactics is 'Didactics = the theory and practice of teaching and learning' (Gundem 2000, 236). In English-speaking countries, the word 'didactic' often has a negative connotation (Gundem 2000). The didactical research tradition in Scandinavian countries, however, is in line with the didactical tradition in France where the word didactics is viewed more positively (Amade-Escot 2006; Gundem 2000, 2011; Quennerstedt and Larsson 2015).

Amade-Escot (2006) describe didactics as the study of the content and its function in the teaching and learning process with a specific focus on the interactive teaching–learning process between student and teacher. Didactics thus concerns the practice of teaching and its methods in general and/or related to a specific subject matter. While Gundem (2011) names this relationship *the didactic triangle*, Amade-Escot (2006) uses the term *didactic system*. We understand these two concepts as similar and have decided to use *didactic triangle* as the analytical lens in this article. The didactic triangle is a model for the arrangement and explanation of the general elements of teaching – teacher, content and student (Gundem 2000). The didactic triangle incorporates the irreducible three-way relationship linking teacher, student(s) and a knowledge object or subject (Amade-Escot 2006). This means that any study of one part of the didactic triangle cannot have any meaning without considering the other two. All three components must be included when investigating teaching. The focus will then be on the dynamics and the evolution of didactical interactions between students and teacher in relation to the content knowledge in the learning environment (Amade-Escot 2006). Didactical analysis often includes questions such as:

- What is learnt?
- How it is taught?
- Why is it taught?
- By whom is it taught?

(Amade-Escot 2006; Caldeborg, Maivorsdotter, and Öhman 2017; Quennerstedt and Larsson 2015). These questions are relevant when investigating different educational practices (Quennerstedt and Larsson 2015), such as our concern with the inter-related dependencies between teacher and students when the subject matter is health in PE.

Method

In order to identify studies on teaching of health in PE, a scoping review was undertaken. A scoping review addresses broader topics and include broader study designs than a systematic review (Arksey and O'Malley 2005). The databases SportDiscuss, ERIC and ISI Web of Science were searched employing the key words '*physical education*' in combination with *health*, *teaching* and *education*. To limit the initial search and focus on quality, the review excluded non – English literature. The literature included is peer-reviewed literature published in academic journals from the last 15

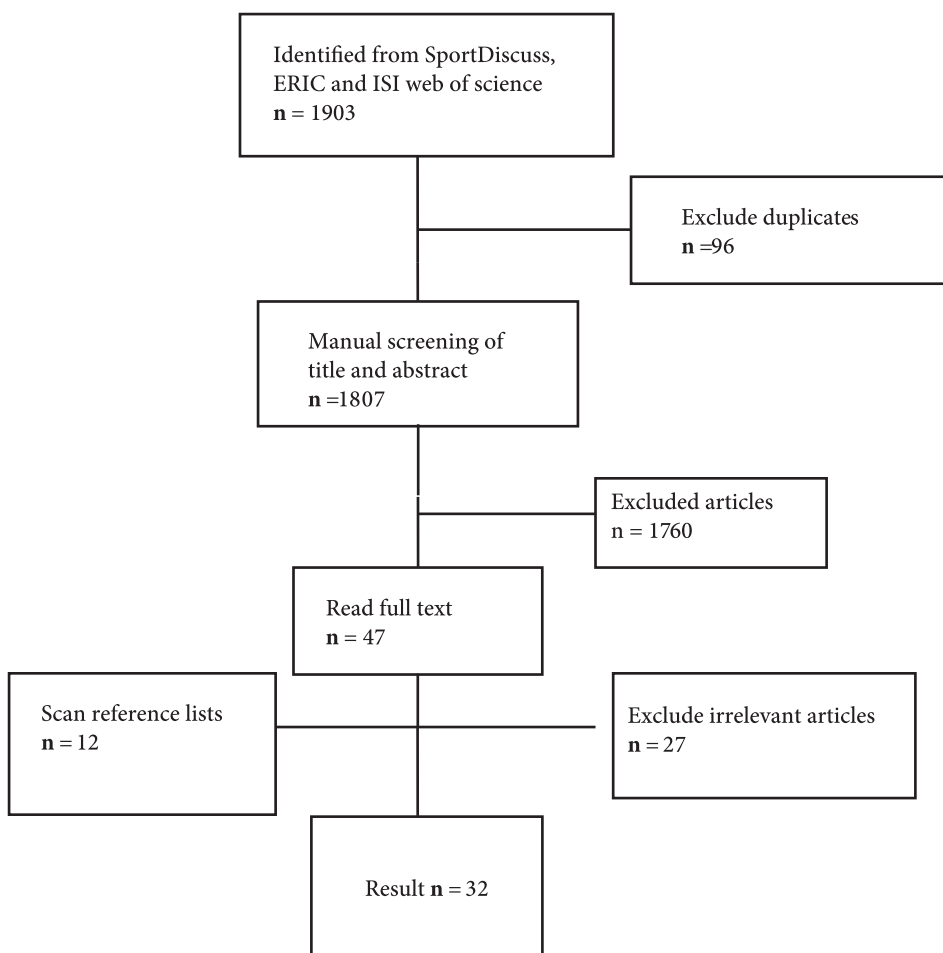


Figure 1. Overview over the research process.

years, 2002–2017 (see [Figure 1](#)). A subsequent search for the early months of 2018 was performed. In addition, a manual search of the last five volumes of the major PE journals (i.e. *Sport, Education and Society*, *Physical Education and Sport Pedagogy*, *Asia-Pacific Journal of Health, Sport and Physical Education*, *Journal of Teaching in Physical Education*) was performed.

As seen in [Figure 1](#), in the initial search 1903 references were identified and imported into EndNote for further scanning. In the next step, EndNote identified 96 references as duplicates. Thus, 1807 references were subjected to a manual screening of title and abstract. In this screening, 1760 references were excluded. The title and abstract of the imported references were scanned and included based on the following inclusion criteria:

- The context is elementary/secondary school/high school.
- Teaching health in PE as the topic.

Exclusions were based on the following criteria:

- Research concerned health education or whole school programs.
- Research aiming to increase physical activity more in general, but not specifically related to PE.
- Teaching of health in PE at university level (e.g. PE teacher education).

After the screening and exclusion process, 47 papers were read full text. In this part of the process the reference list in the included articles were scanned, and 12 papers included in this process. After reading these 59 papers (47 + 12) full text, 29 papers were excluded, based on the inclusion/exclusion criteria. The result of this process was 30 papers which are included in this study.

Analysis

When reading and analysing the articles we used the didactical triangle as our analytical tool. We focused on the different elements of the didactical triangle – content, teacher and student. Therefore, the most interesting parts were how the papers, explicitly or implicitly, addressed the different elements in the triangle and the relationships between them. During this work we found some similarities and differences between the papers with regard to how they conceived the teaching of health in PE. Earlier research ([Armour and Harris 2013](#); [Quennerstedt 2008](#)) also found that how people understand health could impact how they thought of teaching health in PE. Therefore, one of the first things we did was to separate the papers in groups, based on which approach to health they could be related to. We divided the papers in two groups – the *biomedical* and *alternative* perspectives. In PE, the biomedical perspective emphasizes the importance of nutrition and moderate to vigorous physical activity (MVPA) in order to develop good health ([Sallis et al. 2012](#)). Researchers and teachers who advance this perspective often see PE as the right place to learn about physical activity and health ([Sallis and McKenzie 1991](#); [Sallis et al. 2012](#)). For the other group, we decided to use the term ‘alternative perspective’ and include both critical and salutogenic perspectives in this term. This decision was made because there are certain fundamental assumptions related to the conceptualization of health in these two approaches. In addition, both perspectives are advanced as a critique of the dominant biomedical perspective. The critical perspective argues against the healthism ideology and especially the moral requirements public health place on the individual learner. The salutogenic perspective focuses on each individual developing their own health, and therefore sees health as a continuum of health ease / disease ([Antonovsky 1979, 1996](#)). This perspective is concerned with understanding the factors involved in remaining at a given point or moving up along the continuum wherever one is located at a given time ([Antonovsky 1996, 2012](#)).

After separating the papers into these groups, we started to analyze the papers more in detail using the didactical questions (what, how, why and by whom).

Results

In the following section, a review of the content of the papers is given commencing with some descriptive information concerning the literature. The didactical analysis is presented separately for the biomedical perspective (Table 1) and the alternative perspective (Table 2).

Didactical analysis of the biomedical perspective

The articles in the biomedical group present either research on health-related fitness or health-related exercise in PE (Castelli and Williams 2007; Fardy, Azzollini, and Herman 2004; Hastie, Chen, and Guarino 2017; Hodges, Hodges Kulinna, and Lee 2014; Hodges et al. 2016; Kloeppel and Kulinna 2012; McKenzie and Lounsbery 2013; Stewart and Mitchell 2003), or a curriculum model related to teaching and learning of health in PE, e.g. Sports, Play and Active Recreation for Kids (SPARK) or Health Optimizing Physical Education (HOPE) (Cardon et al. 2009; McKenzie, Sallis, and Rosengard 2009; McKenzie et al. 2016; Metzler et al. 2013). In a curriculum model, the content is based on the models feature (Jewett, Bain, and Ennis 1995; Metzler 2011). The salient feature of the SPARK model, for instance, is that the curricula delivered are directed toward public health objectives focusing on developing lifelong physical activity (McKenzie et al. 2016).

Despite the differences between papers, the main objective is to develop lifelong physical activity among students while at the same time increasing the activity levels during class. In the articles we

Table 1. The biomedical group.

Authors	Country	Journal	Purpose
Hodges, Hodges Kulinna, and Lee (2014)	USA	Human Kinetics	To determine the effectiveness of a series of fitness segments that can be used to provide healthy behavior knowledge (HBK).
Cardon et al. (2009)	Belgium	Journal of Teaching in Physical Education	To investigate how classroom-based self-management lessons to promote physical activity were perceived by students, teachers and parents.
Stewart and Mitchell (2003)	USA	Journal of Teaching in Physical Education	To examine high school students' knowledge and conceptions of health-related fitness.
Hodges et al. (2016)	USA	Journal of Teaching in Physical Education	To determine students' health-related fitness knowledge (HRFK) and physical activity levels after the implementation of a series of fitness lessons referred to as Knowledge in Action.
Hastie, Chen, and Guarino (2017)	USA	Journal of Teaching in Physical Education	To examine the process and outcome of an intervention using the project-based learning model to increase students health-related fitness (HRF) knowledge.
McKenzie et al. (2016)	USA	Journal of Teaching in Physical Education	To review background information and studies from the initial grants and the dissemination phases of SPARK, identifies program evolution, and describes dissemination efforts and outcomes.
McKenzie, Sallis, and Rosengard (2009)	USA	Quest	To present background information and review the complete research on the SPARK program and describe the ensuing efforts to disseminate those programs nationally.
Kloeppel and Kulinna (2012)	USA	Strategies	To provide teachers with six different ways for teaching and holding students accountable for HRF knowledge in K-12 physical educational programs.
McKenzie and Lounsbery (2013)	USA	Research Quarterly for Exercise and Sport	To summarize the teachers' effectiveness research in a public health context and offer visions for the future.
Metzler et al. (2013)	USA	Journal of Physical Education, Recreation and Dance	To describe the program HOPE (Health-Optimizing Physical Education).
Fardy, Azzollini, and Herman (2004)	USA	Journal of Teaching in Physical Education	To present a unique physical education program developed to address health problems in teenagers, and to increase emphasis on health-based physical education in teacher preparation programs.
Castelli and Williams (2007)	USA	Journal of Teaching in Physical Education	To examine what teachers know about health-related fitness (HRF) and how confident they are in their knowledge.

Table 2. The alternative group.

Author	Country	Journal	Purpose
Belmont (2014)	USA	Journal of Physical Education, Recreation and Dance	The purpose of this article is to describe the content and provide evidence of how an integrated high-school health, physical education, and wellness program can be implemented.
Svendsen (2014)	Denmark	Sport, Education and Society	To provide a tool for critical reflection that brings greater depth and richness to perceptions of health in PE.
Quennerstedt (2008)	Sweden	Sport, Education and Society	To present different perspectives of how to understand health in PE.
Quennerstedt, Burrows, and Maivorsdotter (2010)	Sweden and Australia	Utbildning och Demokrati	To problematize an individualistic approach to health education and argue for an approach that instead focuses on learning that occurs in the individual.
Armour and Harris (2013)	England	Quest	To stimulate discussion on the potential of working across traditional discipline boundaries to develop new, complex PE-for-health pedagogies.
Thorburn, Jess, and Atencio (2011)	Scotland	Physical Education and Sport Pedagogy	To discuss the curriculum and how to translate this into professional learning and practice.
Azzarito, Simon, and Marttinen (2016)	USA	Journal of Teaching in Physical Education	To explore the extent to which the creation and implementations of a 'Body Curriculum' enhanced students critical embodied learning.
Gray, MacIsaac, and Jess (2015)	Scotland	Retos	To present and argue for a more holistic approach to describing health, and how this broader form of PE can be delivered.
Cale, Harris, and Chen (2014)	England	Sport, Education and Society	To investigate the purpose and prevalence of monitoring health, activity and fitness in PE and establish PE teachers views on this monitoring.
Cale and Harris (2009)	England	Physical Education and Sport Pedagogy	To explore the key issues, concerns and debates regarding fitness testing.
Alfrey, Cale, and Webb (2012)	Australia and UK	Physical Education and Sport Pedagogy	To present and discuss findings from a project which explored PE teachers' experiences, views and understandings of HRE.
Harris and Leggett (2015a)	England and Wales	Sport, Education and Society	To explore and discuss the expression of health within PE curricula in secondary schools in England and Wales.
Harris and Leggett (2015b)	England and Wales	Sport, Education and Society	To explain the mismatch between health-related policy and practice.
O'Brien, Martin Ginis, and Kirk (2008)	Canada, Ireland and UK	Journal of Teaching in Physical Education	To examine the effect of an 8-week body-focused physical and health education module on self-objectification and social physique anxiety.
Haerens et al. (2011)	Belgium and UK	Quest	To make a case for the development of a pedagogical model for health-based physical education.
Alfrey and Gard (2014)	Australia	Asia-Pacific Journal of Health, Sport and PE	To explore the perspectives of teachers on the contested practice of fitness testing.
Webb, Quennerstedt, and Öhman (2008)	Sweden and Australia	Sport, Education and Society	To analyze the discourses of health and embodiment prevalent in PE in Sweden and Australia.
Dudley, Goodyear, and Baxter (2016)	Australia and England	Journal of Teaching in Physical Education	To present a conceptual assessment framework for QPE and HOPE.

have reviewed, there is a common understanding that the appropriate way to teach health-related PE is through a large amount of MVPA (McKenzie et al. 2016). Another aspect of teaching in this group focuses on information about health-related knowledge in order to influence students' health behavior. For example, Hodges, Hodges Kulinna, and Lee (2014; 2016) have developed different fitness segments that include both MVPA and facts about health in order to create better health-related knowledge in students. Notably, also this type of knowledge is taught through activity-based teaching.

The content (i.e. *what* is taught) part of the didactic triangle can be described as being highly structured and pre-determined by the programs. The content is related to the pathogenic view on health and the understanding of increased physical activity equals better health. The idea of health being an individual responsibility is also an important element in the content being taught. The focus

on MVPA during class time has didactical consequences for the content. For instance, it is advocated that games that normally require lower intensity levels should be modified to make them more vigorous (McKenzie, Sallis, and Rosengard 2009, 2016; Metzler et al. 2013).

A pedagogical model is one way to lead and structure the teaching (Casey 2017). This will then influence both the content and the role of the teacher and the student. For example, the curriculum model SPARK comes with professional development for teachers included in this program (McKenzie, Sallis, and Rosengard 2009). A goal for the SPARK professional development is to deliver a standardized implementation package for teachers and schools. This package requires uniformity regarding the curriculum, teacher training and educational materials (McKenzie, Sallis, and Rosengard 2009). This type of professional development makes the teacher a mediator for the content in the SPARK program. The SPARK program comes as a standardized package, where teachers are not supposed to individualize the materials, but the program does provide some opportunity for local school variations. In general, however, the articles in the biomedical group see the teacher as an instructor who delivers a program. What the students are supposed to do is planned in advance and the teacher has to 'deliver' this to the students. The teacher gives direct instructions about each task: the students then have to perform the task.

Metzler (2011) argued that the focus in the teaching should not be on *what* students do, but *how* they do it. In the biomedical articles, content should be 'delivered' in a way that provides little room for student participation in the co-creation of the curricula. The student are expected to participate in MVPA in the lessons, but are thought to have a marginal influence on the curriculum. In this sense, the students can be seen as receivers of information during class. In addition to an activity component, most of the programs also include some form of cognitive part where students learn facts about physical activity and health, as well as self-management strategies. The behavioral component included in the SPARK model, for example, provide the students with facts and information on different aspects of health so that they will, of their own volition, change their behavior to become more physically active (Cardon et al. 2009).

The article *Health-related fitness knowledge development through project-based learning* by Hastie, Chen, and Guarino (2017) is a notable exception in the biomedical group. The aim of their program is that students develop their own health-related fitness knowledge through problem-based learning (PBL). PBL intends to make the students more involved in the didactical process, and the teacher takes a different role. Through the PBL method, the teachers' role was to guide and help the students in their work and learning. Hastie, Chen, and Guarino (2017) thus present teaching of health with a biomedical focus which is different from the other articles in this group in terms of the didactical approach in the sense that they manage to include the students as co-creators of their own knowledge.

Summarizing the didactical analysis of this perspective, it is clear that the main objective (i.e. *what* is taught) is for students to be more physically active, both during class time and during life time. This is supposed to be achieved through increased amounts of MVPA combined with cognitive and behavioral self-management strategies and information about the relationship between physical activity and health. This is taught (i.e. *how* is it taught) through a traditional command style of teaching in which teachers 'follow the script' of the standardized package and learners are receivers of information. It is done so in order to (*why* is it taught) to give the students an opportunity to develop healthier behavior, but also to lower the risk of obesity and other sedentary illnesses. Our analysis suggests that the three components – content, teacher, and students – miss the irreducible *dynamic* link between them (Amade-Escot 2006). With the exception of Hastie, Chen, and Guarino (2017), all of these articles are based on a predominantly though implicitly behavioristic view of learning where the conditions in the teaching are instrumental. This also seems to be the case for the cognitive content of the teaching packages. Being physically active during class will make you healthier (MacDonald 2004). At the same time, the teachers role (*By whom* is it taught) are often strictly planned and therefore there is little room for teachers' and students' to co-create a curriculum that is suited specifically to their local needs and interests.

Didactical analysis of the alternative perspective

Several of the articles in this group are mainly theoretical (Armour and Harris 2013; Belmont 2014; Dudley, Goodyear, and Baxter 2016; Gray, MacIsaac, and Jess 2015; Haerens et al. 2011; McCuaig and Quennerstedt 2018; McCuaig, Quennerstedt, and MacDonald 2012; Quennerstedt 2008; Quennerstedt, Burrows, and Maivorsdotter 2010; Svendsen 2014). Despite this, they make statements and suggestions on how the teaching could be organized and delivered. These statements are based on analysing text-books (Svendsen 2014), existing curricula (Harris and Leggett 2015a, 2015b; Quennerstedt, Burrows, and Maivorsdotter 2010; Thorburn, Jess, and Atencio 2011) and different theoretical perspectives on health (Quennerstedt 2008; Quennerstedt, Burrows, and Maivorsdotter 2010). The articles in this group problematize the individualistic, biomedical perspective on health, and present alternatives for teaching health in PE. Therefore, the analysis of this group is based on the teaching being presented and theoretical arguments advocating a change in order to give students an alternative approach to teaching of health in PE. In the alternative group, there is a broader variation concerning how to think of health than in the biomedical perspective. However, a common feature is a critical view of the biomedical understanding of health as ‘increased physical activity = better health’ (Alfrey, Cale, and Webb 2012; Alfrey and Gard 2014; Armour and Harris 2013; Azzarito, Simon, and Marttinen 2016; Cale and Harris 2009; Gray, MacIsaac, and Jess 2015; Harris and Leggett 2015a, 2015b; O’Brien, Martin Ginis, and Kirk 2008; Quennerstedt 2008; Quennerstedt, Burrows, and Maivorsdotter 2010; Svendsen 2014; Webb, Quennerstedt, and Öhman 2008). As a consequence of their critique of the biomedical perspective, there is a broad understanding that PE teachers must incorporate other understandings of health than the biomedical approach. Quennerstedt and colleagues (e.g. McCuaig and Quennerstedt 2018; McCuaig, Quennerstedt, and MacDonald 2012; Quennerstedt 2008; Quennerstedt, Burrows, and Maivorsdotter 2010) argue that a salutogenic understanding of health can be more prominent in PE. When presenting this approach to health, the content emphasizes the idea that health can be constituted in different ways, not just as an absence of disease (Quennerstedt 2008).

In this group there is also a stronger focus on how to *learn* about health, not just to *introduce* the student to health information (Gray, MacIsaac, and Jess 2015; Quennerstedt, Burrows, and Maivorsdotter 2010). Armour and Harris (2013) present arguments for making a change in how health is presented and taught in PE. They argue that even though health has been expressed differently over time, there is little evidence that the pedagogies have changed. Thus, they argue for the development of a new ‘PE-for-health’, where the teaching must start with the young learner. This shift includes that teachers’ focus must be on how the individual child can learn most effectively and that the content of learning must go beyond teaching sports or fitness. They also suggest that teachers’ professional learning should give more attention to how children/youth learn health rather than just to learn new knowledge about health.

Another issue discussed in the papers is that teaching must provide students with the knowledge and skills to learn to be critical of and reflective about the health information they consume (Azzarito, Simon, and Marttinen 2016; Gray, MacIsaac, and Jess 2015; Harris and Leggett 2015a). Azzarito, Simon, and Marttinen (2016) explored a curriculum model called ‘Body curriculum’ that encourage students to critically explore their embodied identities and express their sense of self in physical culture. The Body curriculum intends to give a holistic understanding of health and tries to encourage students to be critical of the normative and individualistic way of understanding health. At the same time, it also seeks to ‘assist them in becoming active and critical learners in reading, representing and evaluating the cultural misrepresentations of the bodies they mediate, embody and perform in their daily lives’ (Azzarito, Simon, and Marttinen 2016, 56).

When teaching and content focus more on holistic and critical health with extra focus on other domains than the physical, this inevitably influences the role of the teacher. Our analysis suggest that this group of papers emphasizes a different teacher role, where the teacher has to take a step back from the main focus on physical activity, and becomes more of a facilitator of learning. The teacher’s

role is to plan and implement teaching which provides students with opportunities to learn different aspects of health. Students are active participants in the sense that teaching has to challenge them physically, cognitively and emotionally. For instance, Haerens et al. (2011) outline a prototype pedagogical model focusing on health-based PE. The central theme for the model is: 'Pupils valuing a physically active life, so they can learn to value and practice appropriate physical activities that enhance health and well-being for the rest of their lives' (Haerens et al. 2011, 321). While emphasizing appropriate physical activities, the words *valuing* and *learn to value* places the didactical approach in this model in the affective domain. Thus, the students' participation in shaping the content is an important aspect in order to reach the aim of the teaching.

The teaching approaches which present the students with a more critical understanding of health also emphasize their participation in the teaching and learning process. In the teaching approach developed and presented by Azzarito, Simon, and Marttinen (2016), it is clear that the students engage in critical inquiry of health. This makes student participation an important element in this approach. They are not just recipients of information; they contribute to the teaching-learning process, and are more included and participate in discussions.

Summarizing the didactical analyses of this perspective, it is clear that this perspective has a different view of the teaching of health than the biomedical perspective. The main content (i.e. *what* is taught) is a conception of health that is broader than merely an individual responsibility for the physical body. Learning about health also includes critical thinking about health information. This includes a shift from teaching health as a physiological and cognitive domain to also teach health as an affective knowledge object. The content and this way to understand health gives some didactical consequences for how health is being taught. Instead of an overwhelmingly focus on MVPA during class, the focus includes affective learning as well. The reason for teaching health like this (i.e. *why* is it taught) is so students learn to become critical thinkers and come to value a physically active life. The school has to engage students in thinking critically of a more traditional view of health often expressed through media. In this type of teaching the teachers (*By whom*) involve the students in the co-construction of their own learning. Our analysis finds a dynamic and flexible alignment between the different elements in the didactical triangle of content, teacher and student.

Discussion

The starting point for this review was that different understandings of health would give different didactical considerations. The results in this review show that there are clear differences between how the biomedical and alternative perspectives conceptualize health and thus how the content, teaching processes and learning outcomes are aligned. The different didactical considerations are related to differences in how health is presented, what students learn, and differences between teacher and student's role.

The biomedical perspective focuses on teaching health through increasing the level of physical activity in PE. The prime focus on activities is not unfamiliar in PE. Penney and Chandler (2000) claim that this is one of enduring the characteristics of PE. As Kirk (2010) points out, emphasizing activities is not a problem in itself. Rather it is *how* these activities are practiced that constitutes a challenge for the subject. In the biomedical group, the amount and intensity of physical activity are important. The activities, then, have an instrumental purpose, where they are used as a vehicle to develop student's biological health. This could be described as 'learning through movement' (Arnold 1988). A question to ask is what the students actually learn about health from this focus on physical activity? At the same time, we also find research in the biomedical group which combines the activities with learning in the cognitive domain, for example, through self-management strategies (Cardon et al. 2009), where the aim is that teachers, students and their parents will become more physically active. The intention of such self-management components is that children in the future can take more responsibility of their own health. This can be related to the moral aspect in healthism where the individual is responsible for managing risks to one's own health (Kirk and Colquhoun 1989).

From a didactical perspective, one interesting finding from our review is that in the biomedical perspective, activities which normally would have lower levels of physical activity intensity should be modified so that they become moderate to high intensity. The modification of activities is related to research findings where activities at moderate to high intensity levels have more ‘health benefits’ than at lower intensity levels. From a pedagogical perspective, one might question what implications these modifications have on the relevance of the activities in as life-long pursuits or what implications it has for transfer of learning from the school to adulthood?

One difference between the two perspectives is related to content and more specifically the question about what students should learn about health in PE? The alternative perspective has a clear focus on health as a knowledge object, something students should learn about and learn to think critically about. In the biomedical group, the knowledge can be characterized as developing healthy behavior. From this perspective, health is a consequence of physical activity. When this group of articles is concerned with learning, it is for the most part that students should learn strategies or life skills that in turn leads to better health (e.g. self-management strategies).

The didactical triangle (Amade-Escot 2006) has been used as a framework in this review. The three elements in the didactical triangle (content, teacher and students) are recognizable in all health-focused PE programs. However, in the biomedical perspective the content is arguably overly prescriptive and pre-planned, something that may not account sufficiently for the reality of how teachers and students work together in specific locations that will be different from each other. This reduces the important link between content, teacher and student. This said, Hastie, Chen, and Guarino (2017) present a study within the biomedical perspective, which has a closer link between content, teacher and student. As such this is a good example of how the biomedical perspective can be presented in PE programs.

In the alternative perspective, the connection between the components is more dynamic. Several articles in the alternative group are theoretical and discuss the PE curriculum or different theoretical perspectives on teaching of health in PE. This is a weakness with the alternative perspective. Proponents of the biomedical perspective would argue that the alternative perspective is lacking in evidence-based alternatives: little is done to test empirically how the alternative perspective would work in real teaching situations. However, McCuaig, Quennerstedt, and MacDonald (2012) have tested a new salutogenically oriented health literacy unit in a real school setting, Azzarito, Simon, and Marttinen (2016) have developed and implemented the ‘Body curriculum’ and O’Brien, Martin Ginis, and Kirk (2008) have tested the effect of an 8-week body-focused physical and health education module on self-objectification and social physique anxiety. This research are examples of studies in the alternative perspective where they have tested it out in real teaching situations. Nevertheless, more work is needed in PE on teaching and learning about health from other perspective than the biomedical.

In this review we have used the term biomedical and alternative understandings of health and categorized the relevant articles into these two groups. However, it is debatable whether the distinction we have chosen is entirely precise. The alternative perspective is made up mainly of research that consists of a salutogenic and a more critical approach to health. Although these two perspectives have a common starting point in a critique of the biomedical perspective on health, it is questionable whether the two approach have a similar approach to health. There are differences in how health is conceptualized. For instance, the salutogenic approach shares some commonalities with the biomedical approach (e.g. both perspectives work for a development of people’s individual health. However, how they think about this development and their starting point are different).

Conclusion

In this review we have investigated the didactical implications of different approaches to health in PE. By employing a didactical perspective, we have been able to discern certain differences in how the biomedical and alternative approaches see the content of health in PE, as well as the roles of

the teacher and the students respectively. Although the biomedical perspective can be criticized for representing a reductive approach to health, where the intensity levels of the activities appear to be more important than health as a knowledge object, this perspective is also strong in the sense that it has implemented and tested many concrete programs and models. The alternative approach to health in PE has – at least theoretically – been more concerned with health as a knowledge object as well as concerned with the didactical consequences of this approach to health. In a recent article, Quennerstedt (2019) emphasizes the importance of retaining both the Physical and the Educative parts in PE. Our review has highlighted the importance of straddling this divide when it comes to health: if health in PE is considered merely as an outcome of physical activity, it reduces the educative potential of PE. Similarly, if health becomes a merely theoretical object for critical thinking, it reduces the potential of PE to promote a critical understanding of health as an embodied experience.

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