

## Health-related professional competence of physical education teachers: narrative review and heuristic model

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*Physical education (PE) is one setting in which pupils may acquire knowledge and skills to lead physically active lives. PE teachers play a key role in fostering respective health-related competences in pupils. For this, they themselves need appropriate professional competences. The purpose of this article is to highlight research trends on, and to propose a heuristic model for PE teachers' health-related professional competence. Research trends and gaps are identified by a narrative literature review. The heuristic model describes several knowledge domains, beliefs, motivational orientations, and self-regulation as subdimensions of health-related professional competence. It is intended to provide an overview of important competence aspects and to serve as an orientation for further work.*

### 1. Introduction

Physical education (PE) is one setting in which pupils may acquire knowledge and skills to lead physically active lives. PE teachers play a key role in fostering pupils' health-related competences. It is assumed that PE teachers who have specific health-related professional competences are better able to promote such competences in pupils (Brandl-Bredenbeck & Sygusch, 2017).

The scientific discussion on the construct of health-related professional competence of PE teachers is difficult to oversee, because it follows different theoretical lines and has been empirically investigated in heterogeneous ways. Additionally, each country also sets its own normative priorities regarding (health-related) PE that PE teachers should follow. As a result, there is no comprehensive understanding of what specific aspects of professional competence PE teachers should acquire to promote health-related competences in pupils, and how these aspects might be empirically assessed.

The purpose of this research is to give an overview of the current trends in research regarding health-related professional competence of PE teachers, to identify gaps in the research, and to propose a theory-based heuristic model based on the generic model of professional competence (Baumert & Kunter, 2013; Baumgartner, 2022). This heuristic model can both guide future empirical studies, and be used as a basis for curriculum development in PE teacher education (PETE). Thus, our aim is to provide a common framework as a basis for conducting future scientific and curricular discussions on the concept of PE teachers' health-related professional competence.

### 2. The cascade model of competence as a theoretical framework

This article is theoretically based on the cascade model of competence (Krauss et al., 2020). This model can serve as a systematization basis for researching teachers' professional competence. It suggests a "sequential causal chain" (Krauss et al., 2020, p. 1), linking teacher dispositions and pupils' learning gains. Regarding our focus on the topic of health, we assume that what pupils gain in health-related competences is dependent on a specific health-related professional competence in PE teachers (Hapke et al., 2021).

#### 2.1 Pupils' health-related competences as an objective of physical education

The health-related competences of pupils are an important predictor of a physically active lifestyle and are thus an important variable for public health. However, current research shows a variety of approaches to teaching health in PE (Harris & Leggett, 2015b; Palmer & Behrens, 2017; Ptack & Tittlbach, 2018). Mong and Standal (2019) described two didactic approaches to health-related PE, distinguishing between 'biomedical' and 'alternative'. The main objective of the *biomedical perspective* is to develop lifelong physical activity (PA) among pupils by

increasing the activity levels in PE classes. Thus, an appropriate way to teach health-related PE would be to include a large amount of moderate to vigorous physical activity (MVPA) (McKenzie & Lounsbury, 2013). This approach also covers knowledge about associations among PA and health, as well as self-management strategies (Hodges et al., 2014), such as those described in psychological theories about health behavior change (Pfeffer, 2010). In contrast to this approach, the *alternative perspective* focusses on pupils learning to be critical of and reflect on the health information they consume. Concepts following this perspective go beyond fitness training and amount of movement time, as for example the socially critical approach to health education (Wright et al., 2018).

From a German perspective, didactical concepts and curricula mainly focus on the alternative approach<sup>1</sup>. PE teachers should thus foster pupils' abilities to create and reflect on a physically active lifestyle. This includes engaging in PA and sports in a healthy way, assessing the health effects of their own sports activities, making healthy choices, and modifying their activities to lead healthier lives (Cale & Harris, 2018; Ptack & Tittlbach, 2018). Thus, the acquisition of health-related knowledge is one specific element of health-related competence, and an essential prerequisite for performing a variety of physical activities and maintaining a healthy lifestyle. It is perceived as a central learning goal of PE comprising not only the principles of movement and performance, but also the requirements, antecedents, and values of following a physically active lifestyle (Cale & Harris, 2018; Keating et al., 2009). Overall, this approach is strongly related to the concept of physical literacy, as it comprises a holistic understanding including motivation and confidence, knowledge and understanding, as well as physical competence (Whitehead, 2010). Furthermore, it is also aligned with general health-related competencies that follow the concept of health literacy (Kickbusch et al., 2013) or life skills (World Health Organization [WHO], 2003). Health-promoting schools can build an ideal environment to foster such general health-related goals (WHO, 2021). PE teachers can play a particularly important role in developing pupils' competences in the field of PA and sports.

## 2.2 PE teachers' health-related professional competence

The acquisition of competences in pupils is dependent on the professional competence of their teachers (Krauss et al., 2020). Professional competence can be seen as a continuum between dispositions such as cognition or affect-motivation, and teacher performance in class as an observable behavior (Baumgartner, 2022; Blömeke et al., 2015). According to the generic model of professional competence (Baumert & Kunter, 2013), we concentrate in this article on dispositions. This means that professional practice is interpreted as the result of an interplay of teachers' professional *knowledge, beliefs, motivational orientations, and self-regulation*.

At the core is professional *knowledge* as the cognitive basis and reflective lens for teaching in class. This profession-specific knowledge goes beyond everyday knowledge and can be acquired in PETE (Kunter et al., 2013). Professional knowledge can be divided into different domains (Baumert & Kunter, 2013; Shulman, 1987): content knowledge (CK), pedagogical content knowledge (PCK), pedagogical/psychological knowledge (PPK) and organizational knowledge (OK). CK and PCK are considered particularly important for high-quality teaching in the respective school subjects, and are thus subject-specific. CK is the knowledge of subject matter and is defined as a deep understanding of the content to be taught. PCK is the knowledge necessary to make the content accessible and comprehensible to pupils; PCK thus represents specific knowledge related to teaching and pupils. PPK and OK are subject-unspecific knowledge domains, but they are nevertheless important for professional practice beyond teaching in the respective subject. PPK comprises generic knowledge of education, teaching, and learning. OK includes knowledge of the systemic, structural, and institutional framework conditions of the education system and one's school, as well as management and governance (Baumert & Kunter, 2013; Kunter et al., 2013).

*Beliefs* are conceptualized as a set of interrelated cognitive perceptions about the nature of something or how it works. In contrast to knowledge, beliefs include individual emotional judgements of the truth or falsity of these propositions and do not have to satisfy the criterion of consistency (Fives & Buehl, 2012). As mostly unquestioned personal truths, beliefs provide structure, support and orientation to professional actions and thinking (Skott, 2015). Various types of beliefs can be distinguished: e.g., epistemic beliefs about the topic, which include individual ideas about the nature and genesis of discipline-specific knowledge; or instructional beliefs, which include subjective theories about teaching and learning in a school subject (Tsangaridou, 2009).

<sup>1</sup> It is important to mention that this article is written from a German perspective. In Germany, PE is a compulsory subject in all school levels and comprises between one and three 45-minute units per week. Health is an important aspect of PE in the 16 curricula of the federal states. The curricula are linked to a didactic approach, known in Germany as "erziehender Sportunterricht" (Balz & Neumann, 2005).

*Motivational orientations* are seen as “vital for teachers to succeed in their profession in the long term” (Kunter et al., 2013, p. 807). They comprise self-related cognitions such as self-efficacy beliefs, intrinsic motivation, or enthusiasm, i.e., the extent to which teachers find their work enjoyable and meaningful. Motivational orientations are associated with “more effective and innovative teaching behaviors”, and the pupils’ learning motivation (Baumert & Kunter, 2013; Kunter et al., 2013).

*Self-regulation* describes the ways teachers cope with occupational demands, crucial for long-term well-being and professional performance. It comprises the ability to engage oneself while simultaneously managing one’s personal resources responsibly (Baumert & Kunter, 2013; Kunter et al., 2013).

Professional competence is specific to the topic and situation (Baumert & Kunter, 2013) and must therefore be conceptualized specifically for the context of PE and the health topic. Several specifications have been made for PE-specific professional competence in general (e.g., Baumgartner, 2022) and even more specific with a focus on CK (Heemsoth, 2016; Ward, 2011) and PCK (Vogler et al., 2017; Ward et al., 2020). To date, there has been less research on health as a topic in the PE curriculum with the professional competence model as a theoretical lens. Where this has been examined, it is usually done in isolated segments, i.e., focusing on CK or beliefs (e.g., Santiago & Morrow, 2021). However, a comprehensive model of health-related professional competence is still lacking.

### 3. Purpose and methodological approach

To provide a framework for future discussion, the purpose of this article is to: (1) highlight international research trends regarding the health-related professional competence of PE teachers, and (2) propose a heuristic model that provides a structured overview of relevant aspects of the health-related professional competence of PE teachers. In this article, we want to answer the following research questions:

- (1) What research trends and gaps can be identified regarding PE teachers’ health-related professional competence in terms of knowledge, beliefs, motivational orientations and self-regulation?
- (2) Which aspects of PE teachers’ health-related competence can be derived from the research trends against the background of an ‘alternative’ pedagogical approach to health-related PE?

Therefore, we first outline the field of research based on a narrative review. We summarize topics and concepts that are currently being researched, and normative and theoretical discourses that are being conducted, and identify largely unnoticed aspects or research gaps, respectively (Chapter 4). In the second step (Chapter 5), we propose a heuristic model of PE teachers’ health-related professional competence based on the theoretical framework of Baumert and Kunter (2013) and based on a normative understanding that favors ‘alternative’ approaches to health-related PE (Mong & Standal, 2019). Our research questions address a field that is conceptually diffuse and empirically explored through very different paths. Researchers use different terms and concepts to describe and investigate the construct or parts of the construct that we call ‘professional competence’. In view of the research deficit regarding conceptual clarity and overview, our contribution aims to take a first step towards systematizing the current state of research, identifying points of reference and similarities, and differentiating relevant aspects. Even though strictly systematic procedures such as a systematic review could produce more representative results, they have the disadvantage of assuming uniform terms and constructs (Zawacki-Richter et al., 2020), which are not given in the present case. The methodological approach in this study is therefore based on a narrative review (Ferrari, 2015), which allows exemplary insights into relevant research trends and findings based on empirical studies, and heuristic articles on the health-related professional competence of PE teachers since the year 2000.

For the literature review, an electronic database search strategy was employed using several education, sports, PE and social science databases. The three key concepts ‘professional competence’, ‘PE teacher’ and ‘health’ were included in the search and combined with the Boolean operator ‘AND’ (Kugley et al., 2017). For each key concept, synonyms and related terms were specified and combined with ‘OR’.

Papers from 2001 onwards were included in the review, the majority published between 2010 and 2022. Most papers were published from research teams in North America and Europe, followed by Australia. We evaluated mainly empirical articles with qualitative, quantitative and mixed methods approaches, and heuristic papers and opinion pieces published in peer reviewed journals. The competence aspects of the Baumert and Kunter (2013) model served as a structuring basis for the identification of key topics and lines of discussion, which are summarized in the following chapter.

#### 4. PE teachers' health-related professional competence – research trends

Overall, it is striking that many researchers emphasize the importance of PE teachers' ability to teach health-related PE to prepare pupils for healthy lifestyles and lifelong PA (Corbin, 2004; McKenzie & Lounsbury, 2013; Palmer & Behrens, 2017). Some researchers also address the need for PE teachers to be prepared for this task during PETE (Blankenship & Ayers, 2010; Corbin & McKenzie, 2008; Wright et al., 2018). Often, however, the explanations remain superficial when it comes to what specific competences PE teachers need or should acquire during PETE to be able to design high-quality health-related PE. Few researchers refer to the theoretical framework of professional competence as outlined in the introduction (Choden & Sherab, 2020; Hapke et al., 2021; Santiago & Morrow, 2021).

##### 4.1 Content knowledge as a key to teaching health-related PE

In many articles, particularly from the USA, PE teachers' professional knowledge is considered an important prerequisite of teachers' competence and pupils' learning outcomes, and is thus presented as key to teaching quality (e.g., Kern et al., 2020; Santiago & Morrow, 2021). Based on normative-theoretical arguments, suggestions are made regarding what PE teachers should know about teaching PA and fitness (Corbin, 2004) and how PETE should be designed to impart appropriate knowledge (Corbin & McKenzie, 2008; Hodges et al., 2017). Referring to Shulman (1987), it is suggested that PE teachers need both health-related content knowledge (CK) and health-related pedagogical content knowledge (PCK) to foster health-related learning in PE (Hapke et al., 2021). Health-related CK can be seen as the “profound and interdisciplinary academic knowledge on the topics of health, PA, exercise and sports” (Hapke et al., 2021, p. ii28). It includes in-depth knowledge of biomedical and socio-ecological models of health and illness, or of endurance training and its effects on the cardiovascular system (Brandl-Bredenbeck & Sygusch, 2017; Hapke et al., 2021).

In line with modern concepts of health, some articles call for a broad understanding of health that includes objective physical aspects (e.g., exercise physiology; fitness program planning) as well as subjective psychosocial aspects (e.g., psychosocial well-being; stress management), and additional aspects such as hygiene or nutrition (Brandl-Bredenbeck & Sygusch, 2017; Choden & Sherab, 2020; Wilkinson et al., 2018; Wright et al., 2018). Teachers should for example “understand the psychological and social concepts related to valuing and practicing an active life” (Haerens et al., 2011, p. 331). However, most authors refer mainly to the objective physical perspective (Corbin, 2004; Hunuk et al., 2012; Kern et al., 2020; Santiago et al., 2016).

Qualitative studies from Australia and UK show that pre-service (Fane et al., 2019) and in-service (Harris & Leggett, 2015a) PE teachers' knowledge of health issues in the context of PE is limited and the concepts are unclear (e.g., the differences between ‘health’, ‘fitness’ and ‘well-being’). However, the findings of a Turkish mixed-methods intervention study indicate that it is possible to influence PE teachers' health-related fitness CK, and consequently their teaching styles and pupils' knowledge acquisition, when teachers participated in a Community of Practice (Hunuk et al., 2012).

Quantitative studies mainly from the USA use health-related fitness knowledge tests, comprising knowledge of fitness components (e.g., muscular strength), test items (e.g., push-ups), fitness zones of ‘Fitnessgram’, and designing fitness programs (Castelli & Williams, 2007). Furthermore, broader topics like associations between fitness, PA and health are considered (Santiago & Morrow, 2021). The studies suggest that pre-service (Harris, 2014; Santiago et al., 2016; Santiago & Morrow, 2021) and in-service (Castelli & Williams, 2007; Santiago et al., 2012) PE teachers in the USA lack CK in health-related fitness.

##### 4.2 Variety of pedagogical-didactical approaches in health-related PE as a core element of pedagogical content knowledge

The above-mentioned studies mainly deal either with unspecified knowledge or with CK. It is emphasized that PE teachers need to be able to use CK for planning, implementing and evaluating appropriate PE lessons (Brandl-Bredenbeck & Sygusch, 2017; Wilkinson et al., 2018). The term PCK, on the other hand, is hardly ever explicitly mentioned. According to Hapke et al. (2021, p. ii29) knowledge “about health-related goals (e.g., pupils' health-related knowledge), content (e.g., objective or subjective) and adequate teaching didactics (e.g., higher-order thinking)” can be seen as health-related PCK. Based on this definition, various pedagogical-didactical approaches can be identified that are assumed to be suitable for providing health-related PE. In all these papers, there seems to be a consensus that PE teachers should aim to educate and guide pupils towards a lifelong and self-determined physically active lifestyle (Bulger et al., 2001), as suggested in ‘fitness for life’

pedagogies (Harris & Leggett, 2015a). However, there are different didactical approaches to achieving this overarching learning goal.

On the one hand, some researchers particularly from USA follow a 'biomedical' approach (Mong & Standal, 2019). According to this approach, PE teachers must first be able to maximize pupils' moderate to vigorous physical activity (MVPA) in class by choosing appropriate activities and effective classroom management (e.g., McKenzie & Lounsbury, 2013). Second, PE teachers should give facts about PA and health, as well as self-management strategies to influence pupils' health behaviour (e.g., Wilkinson et al., 2018). Third, they must be effective in developing and improving pupils' motor skills as a prerequisite for lifelong participation in PA, exercise and sports (e.g., Choden & Sherab, 2020). Teachers therefore must know an appropriate standardized PE curriculum (e.g., SPARK, conceptual PE) and be able to implement these programs as 'instructors' (Corbin & McKenzie, 2008). On the other hand, some researchers especially from Europe and Australia follow a more 'alternative' approach (Mong & Standal, 2019). The main task of PE teachers here is to help pupils become increasingly independent in terms of being active in a healthy way, both at school and beyond in a wide range of physical activities (Harris & Leggett, 2015a). Based on a more holistic view of health with particular focus on aspects beyond the physical, pupils should learn to be critical of and reflect on the health information they consume, and to value and practice appropriate physical activities that enhance health and well-being throughout their lives (Haerens et al., 2011). PE teachers thus must mainly be learning companions and providers of learning opportunities during pupils' critical inquiry of health-related situations and tasks in PE, which can be supported by approaches such as joy-oriented PE (Blankenship & Ayers, 2010) or pupil-centered PE (Haerens et al., 2011; Wright et al., 2018).

Most of these didactic approaches have been suggested in heuristic and opinion papers. Empirical evidence was only provided for the positive effect of PE teachers' use of a transformational teaching style, including a task-oriented learning climate, in which pupils could learn about their PA behavior in leisure time in a self-directed way, in a study from Spain (Castillo et al., 2020). Other qualitative studies investigated appropriate didactical approaches from the perspective of pre-service (Fane et al., 2019; Wright et al., 2018) and in-service (Harris & Leggett, 2015a) PE teachers, and PE teacher educators (Hapke et al., 2021). The results of these studies are summarized below (cf. section 4.4).

#### 4.3 Whole-school approaches to health education and the role of PE teachers' organizational knowledge

In line with the public health agenda, health is not only central to PE but is also an objective of whole-school approaches – such as health-promoting schools (WHO, 2021) – in which PE teachers play an important role (McKenzie & Lounsbury, 2013; Zhang et al. 2018). McKenzie and Lounsbury (2013) emphasize that “effective teachers should be expected to promote physical activity engagement outside of class time” (p. 425). Thus, PE teachers' effectiveness within the public health context “should be judged primarily by student outcomes related to health” (p. 421), e.g., their PA engagement or physical fitness.

Regarding whole-school approaches, one of the most cited frameworks is the Comprehensive School Physical Activity Program (CSPAP) (Castelli et al., 2014; Zhang et al., 2018). This framework comprises several elements such as PE, but also PA during the school day, including before and after school. Zhang et al. (2018) suggest three different facets of competence PE teachers should acquire in this regard: *Concept changing* requires that PE teachers “understand CSPAP concepts, explore strategies for implementing a CSPAP, and attend related professional development” (p. 13). *Leadership and coordinator* skills refer to the ability to design appropriate school-based PA opportunities beyond PE (i.e., active recess, classroom PA breaks) and to “build a supportive environment for CSPAP” (p. 15), including administrators, classroom teachers, parents, and communities. *Technological application* refers to the use of “social media technologies as resources for PA promotion” (p. 15).

Regarding public health requirements, PE teachers are challenged not only in terms of designing high-quality health-related PE lessons, but also as health experts at the school level. This requires a profound knowledge of CSPAP beyond CK and PCK. Although not explicitly named as such in the articles, this kind of knowledge that PE teachers need “to take a leadership role in the school health movement” (Kelder et al., 2014, p. 440) can be seen as a part of OK. Chong et al. (2018) support this assumption empirically, identifying several kinds of health work that Australian PE teachers must do, for example curriculum-related or policy work. Fane et al. (2019) argue that not only should PE teachers provide health education, they are the ones who are best trained for the task.

#### 4.4 Inventory of beliefs, attitudes, and philosophies of PE teachers

Beliefs about health education in PE are mostly investigated inductively using qualitative research methods. Few researchers assess the health-related beliefs of PE teachers quantitatively (e.g., Alfrey et al., 2019). The studies reviewed refer to health-related *epistemic beliefs* and *instructional beliefs*.

Regarding *epistemic beliefs about the health concept*, some studies report a somewhat biomedical perspective on health of PE teachers, as reflected in the ‘healthism’ ideology (Alfrey et al., 2019; Wright et al., 2018). (Pre-service) PE teachers in these studies have a “medico-scientific view of health imbued with individualised, risk discourses” (Wright et al., 2018, p. 117) and focus on PA and nutrition behavior as important aspects of individual health (Kayhan & Üstün, 2019; Wilkinson et al., 2014). Others show that pre-service (Welch & Wright, 2011) and in-service (Harris & Leggett, 2015a) PE teachers are also critical of the healthism concept. One Norwegian study investigated how beliefs about health and the body may be shaped by social media and found that in the eyes of preservice PE teachers, social media mainly reveals ‘body pressure’ stories, but there are also stories of ‘body positivity’, showing that the dominant appearance ideals are sometimes challenged (Langnes & Walseth, 2021).

Research on the *instructional beliefs* refers to health-related goals, contents, and teaching didactics. PE teachers in Brazil (Nasario et al., 2020), Taiwan (Lai et al., 2018), and China (Jin, 2013) are basically positive towards health education in PE, and positive attitudes have facilitated the health education teaching intentions. However, teachers seemed to have only loose definitions on how to provide health-related learning opportunities in PE (Nasario et al., 2020). Additionally, personal, systematic, and structural, and cultural barriers may prevent the implementation of health-related goals in PE (Hodges et al., 2017; Jin, 2013).

Health-related *goals* are thought to be highly relevant in PE across the world (e.g., Adamakis & Zounhia, 2015; Wilkinson et al., 2014). PE teacher educators and (prospective) PE teachers mostly propose ‘fitness for life’ goals for PE, e.g., fostering physical literacy and lifelong physically active lifestyles, and some ‘fitness for performance’ goals (Chroinin & Coulter, 2012; Hapke et al., 2021; Harris & Leggett, 2015a; Hodges et al., 2017; Jin, 2013). Longitudinal studies demonstrate that beliefs about PE goals might be challenged through specific interventions (Hapke et al., 2021), initial PETE (Adamakis & Dania, 2020) or ongoing professional development (Hodges et al., 2017). Several studies have found discrepancies between beliefs and performance, often providing evidence that PE teachers argue with a ‘fitness for life’ perspective while their teaching practice reflects a ‘fitness for performance’ approach, emphasizing sports performance, competitive games or fitness-related testing and training as learning goals and content of PE (Harris & Leggett, 2015a; Wright et al., 2018). Additionally, health-related fitness knowledge is mostly seen as a critical *content* area for PE (Hodges et al., 2017).

Regarding *teaching didactics*, several papers have investigated beliefs about fitness testing which may be seen as a biomedical approach and a manifestation of the ‘fitness for performance’ paradigm (Alfrey & Gard, 2014). Many PE teachers generally have positive attitudes towards fitness testing, as they consider it a suitable way of monitoring and improving pupils’ fitness and motivating them to become more active (Harris & Leggett, 2015a). Indeed, Fredrick and Silverman (2020) showed that PE teachers’ attitude towards fitness testing may have a positive effect on pupils’ performance on fitness tests. However, PE teachers are also critical of fitness testing within the PE curriculum and have questioned its educational value (Alfrey & Gard, 2014; Cale et al., 2014).

Another line of research regarding instructional beliefs has been found regarding the role of social media in health-related PE teaching. Prospective PE teachers in Norway have emphasized the relevance of working with social media and the “importance of developing [pupils’] awareness of social media’s power ... and [their] capacities for critical reflection” (Langnes & Walseth, 2021, p. 13). In consequence, some researchers provide implications for PETE to facilitate a broader, more socially critical and educative approach (e.g., Wright et al., 2018).

#### 4.5 PE teachers' motivation towards role-modelling health and fitness

Several studies, mainly from the USA, emphasize the important influence of PE teachers on the physical PA of their pupils, as they are role models for a healthy lifestyle, especially regarding diet and PA (Baghurst & Bryant, 2012; Cardinal & Cardinal, 2003; Wilkinson et al., 2014). This argumentation goes back to the social learning theory of Bandura (1977), which proposes that most behavior is learned from observing, and earlier empirical findings suggesting that pupils’ motivation for exercising was higher when being taught by PE teachers who were not overweight (e.g., Melville, 1999). Additionally, more recently, Kern et al. (2020) for example found that PE teachers’ PA level (weekly MVPA) was the strongest predictor of pupils’ health-related fitness knowledge, instead of teachers’ CK (cf. section 4.1).

The aspect of role-modelling cannot be clearly located in the generic model of professional competence (Baumert & Kunter, 2013) for several reasons. First, this model does not include aspects of teachers’ lifestyle or

physical skills. Second, the studies mentioned above are vague and inconsistent in their theoretical assumptions regarding role-modelling. Kern et al. (2020), for example, suggest that PE teachers' active lifestyles go along with stronger beliefs regarding the relevance of health topics as content in PE. In contrast, Liu et al. (2020) interpreted role-modelling health and fitness as a self-regulatory skill in the sense of health literacy.

In this regard, several researchers advocate for PE teachers being able to show an appropriate fitness level (Baghurst & Bryant, 2012); however, findings from fitness assessments indicate that PETE-students at one North American University lacked the ability to demonstrate competence in all components of a health-related fitness test (Coleman et al. 2013).

#### 4.6 Summary and largely overlooked aspects

The narrative review shows lively research activity on the aspects of PE teachers' competence in relation to health issues in PE and in schools. It has been demonstrated that professional knowledge (especially CK, PCK, and OK), epistemic and instructional beliefs about the health topic in PE, and motivational orientations are considered important. The reviewed research usually refers to individual competence aspects without using more comprehensive models that include several aspects of professional competence. Additionally, self-regulation (Baumert & Kunter, 2013) is largely overlooked in the identified literature. Regarding motivational orientations, we found more studies dealing with motivation towards leading and role-modelling healthy lifestyles, and less evidence regarding teaching-related motivation or self-efficacy, with a few exceptions (Castelli & Williams, 2007). The research tended to show an inventory of teachers' knowledge and beliefs, or normative suggestions about what teachers should know and be able to do. Regarding CK and PCK, researchers to date have focused on knowledge about health in general and in the context of PA and PE, without explicitly referring to psychological models of behavior change (Pfeffer, 2010). Appropriate knowledge about the intention-behavior gap in PA could help PE teachers empower students to overcoming the gap in a more targeted way. Empirical studies on the effects of specific health-related dispositions of PE teachers and pupil-level outcomes are largely lacking. The few empirical studies paint a rather diffuse picture, as they shed light on very different aspects and do not consistently confirm theoretical assumptions (e.g., Castillo et al., 2020; Chen et al., 2017; Fredrick & Silverman, 2020; Hunuk et al., 2012).

### 5. A heuristic model of health-related professional competence

In this chapter, we suggest a heuristic model of health-related professional competence that may serve as a basis for further studies and normative work. This model is to be understood as a summary of the narrative review presented in Chapter 4, viewed through a specific lens: Following the overarching intention of 'fitness for life' pedagogies (cf. 4.2, 4.4), we are pursuing more of an 'alternative' approach to health-related PE, which is in line with the 'erziehender Sportunterricht' concept and German PE curricula (Balz & Neumann, 2005; Ptack & Tittlbach, 2018) (cf. 2.1). The aspects of professional competence listed in the table should thus contribute to PE teachers' ability to design health-related PE, ensuring it is oriented towards pupils' competence development, is based on a holistic and socio-ecologically embedded understanding of health, and is taught in a pupil-centered manner. It is important to say that not all the articles included in the narrative review above support this normative understanding of PE. For the proposed heuristic, we draw on those sources that support the 'alternative' notion. Additionally, we completed some aspects if the review did not reveal respective findings in line with our normative understanding (e.g., in-depth knowledge of global aspects of health including associations among different aspects of health, inclusive PE). The suggested model focuses on the health-specific aspects of professional competence. Furthermore, we assume that common standards of quality PE (e.g., inclusive education) are applied in principle (UNESCO, 2015).

The heuristic model presented in Table 1 is fundamentally based on the generic model of professional competence (Baumert & Kunter, 2013) and organized according to the essential competence aspects, professional knowledge (CK, PCK, OK), beliefs, motivational orientations, and self-regulation. The table provides an overview of important competence aspects, domains, and facets (Baumert & Kunter, 2013) and could serve as a guide in further theoretical and empirical work. It does not claim to be a sufficiently differentiated theoretical model including operationalization of specific variables. Rather it is intended to be a framework that provides references to further literature, following an 'alternative' approach to health-related PE.

Table 1

*Heuristic model of PE teachers' health-related professional competence*

Competence aspects	Further reading
<b>Health-related content knowledge (CK)</b>	
In-depth knowledge of global aspects of health <ul style="list-style-type: none"> <li>- academic concepts of health, fitness and well-being</li> <li>- biomedical and socio-ecological models of relationships between health and PA (e.g., PA recommendations)</li> <li>- concepts and theories of motivation, self-management and behavior change</li> <li>- associations among objective and subjective, or psychosocial and physical aspects of health</li> </ul>	Corbin, 2004; Brandl-Bredenbeck & Sygusch, 2017; Hapke et al., 2021; Wilkinson et al., 2018
In-depth knowledge of objective aspects of health <ul style="list-style-type: none"> <li>- physical fitness concepts</li> <li>- fitness components (e.g., muscular strength),</li> <li>- fitness test items (e.g., push-ups)</li> <li>- (healthy) fitness zones of 'Fitnessgram'</li> <li>- designing fitness programs</li> <li>- difference between health-related physical fitness and skill-related fitness</li> </ul>	Castelli & Williams, 2007; Corbin, 2004; Hunuk et al.; 2012; Kern et al., 2020; Santiago et al., 2016; Santiago & Morrow, 2021
In-depth knowledge of subjective aspects of health <ul style="list-style-type: none"> <li>- mental and social well-being concepts</li> <li>- subjective awareness of physical well-being</li> <li>- psychological and social concepts related to valuing and practicing an active life</li> </ul>	Corbin & McKenzie, 2008; Haerens et al., 2011; Santiago & Morrow, 2021; Wright et al., 2018
In-depth knowledge of complementary aspects of health <ul style="list-style-type: none"> <li>- hygiene concepts</li> <li>- nutrition concepts</li> <li>- safety concepts</li> <li>- concepts of risk behavior</li> <li>- concepts of fitness and wellness consumerism</li> </ul>	Brandl-Bredenbeck & Sygusch, 2017; Choden & Sherab, 2020; Santiago & Morrow, 2021
<b>Health-related pedagogical content knowledge (PCK)</b>	
Knowledge of health-related learning goals in 'fitness for life' pedagogies <ul style="list-style-type: none"> <li>- knowledge and understanding of health and its relationships with PA</li> <li>- self-management strategies to regulate one's own health behavior in a self-determined way</li> <li>- basic exemplary motor skills as a prerequisite for lifelong participation in PA, exercise, and sports</li> <li>- practical experiences in MVPA</li> <li>- ability to value and practice appropriate physical activities that enhance health and well-being</li> <li>- ability to be critical of and reflect on health information consumed (e.g., via social media)</li> </ul>	Alfrey & Gard, 2014; Choden & Sherab, 2020; Haerens et al., 2011; Hapke et al., 2021; Harris & Leggett, 2015a; Langnes & Walseth, 2021; McKenzie & Lounsbury, 2013; Wilkinson et al., 2018
Knowledge of health-related learning content <ul style="list-style-type: none"> <li>- global, objective, subjective and complementary aspects regarding health and its relationships with PA (cf. health-related CK)</li> <li>- health and fitness as a subject in social media</li> </ul>	Brandl-Bredenbeck & Sygusch, 2017; Haerens et al., 2011; Langnes & Walseth, 2021
Knowledge of (alternative) health-related teaching didactics <ul style="list-style-type: none"> <li>- general teaching quality: classroom management; motivational, caring climate</li> <li>- transformational and task-oriented: stimulating reflection and critical inquiry of health and health behavior</li> <li>- pupil-centered, joy-oriented, inclusive</li> <li>- learning with and about health-related social (and other digital) media</li> </ul>	Blankenship & Ayers, 2010; Castillo et al., 2020; Haerens et al., 2011; Wilkinson et al., 2018; Wright et al., 2018
Knowledge of pupils' health-related competence <ul style="list-style-type: none"> <li>- knowledge of the relevance of health-related PA in pupils' everyday life (e.g., fitness-related social media activities)</li> <li>- knowledge of pupils' health-related knowledge and beliefs</li> </ul>	Baumert & Kunter, 2013



<b>Health-related organizational knowledge (OK)</b>	
<p>Knowledge of CSPAP</p> <ul style="list-style-type: none"> <li>- five integral components to foster PA: (a) PE, (b) PA during school, (c) PA before/after school, (d) staff involvement and (e) family/community engagement</li> <li>- plan, advocate and promote PA programs for school staff, parents and community members</li> <li>- concept-changing through CSPAP (curriculum modifications, e.g., set goals, add public-health contents)</li> <li>- leadership and coordinator skills (e.g., serve as a mediator to connect and cooperate with different resources)</li> <li>- apply new technologies (e.g., social media)</li> </ul>	Castelli et al., 2014; Jin, 2013; Hodges et al., 2017; Zhang et al., 2018
<b>Health-related beliefs</b>	
<p>Epistemic beliefs about health</p> <ul style="list-style-type: none"> <li>- holistic understanding of health, including physical, psychological, social and environmental aspects</li> <li>- adopting an alternative, socially critical or 'fitness for life' perspective on health</li> <li>- critical appraisal of biomedical, healthism and 'fitness for performance' discourses</li> <li>- valuing the health-promoting role of PA</li> </ul>	Alfrey et al., 2019; Alfrey & Gard, 2014; Hapke et al., 2021; Haerens et al., 2011; Harris & Leggett, 2015a; Kayhan & Üstün, 2019; Welch & Wright, 2011; Wright et al., 2018
<p>Instructional beliefs</p> <ul style="list-style-type: none"> <li>- valuing the health-promoting role of PE</li> <li>- advocating 'fitness for life' goals and content in PE</li> <li>- valuing pupil-centered teaching didactics and 'fitness for life' pedagogies</li> <li>- critically appraising pros and cons regarding fitness testing to foster lifetime PA</li> <li>- critically reflecting on social media's power on pupils' understanding of health and body, acknowledging the relevance of working with social media in health-related PE</li> </ul>	Alfrey and Gard, 2014; Alfrey et al., 2019; Cale et al., 2014; Langnes & Walseth, 2021
<b>Health-related motivational orientations</b>	
<p>Motivation towards health education in PE</p> <ul style="list-style-type: none"> <li>- positive attitude regarding health education in PE</li> <li>- motivation to implement health education in PE despite implementation barriers</li> </ul>	Jin, 2013; Hodges et al., 2017; Lai et al., 2018; Alfrey et al., 2012
<p>Self-efficacy</p> <ul style="list-style-type: none"> <li>- confidence in one's health-related professional knowledge</li> <li>- confidence in one's ability to teach health-related PE</li> </ul>	Castelli & Williams, 2007
<p>Motivation for leading and role-modelling a healthy lifestyle</p> <ul style="list-style-type: none"> <li>- motivation for exercising and healthy diet</li> <li>- role-modelling health and fitness</li> <li>- embodiment of health-related beliefs</li> </ul>	Baghurst & Bryant, 2012; Kern et al., 2020; Wilkinson et al., 2014
<b>Health-related self-regulation</b>	
<ul style="list-style-type: none"> <li>- ability to maintain a healthy lifestyle to constructively cope with the challenges of everyday teaching and challenges</li> <li>- acknowledging the important role of professional development for the quality of health-related PE and one's own well-being</li> </ul>	Castelli & Williams, 2007; Haerens et al., 2011; Hodges et al., 2017; Hunuk et al., 2012; Santiago et al., 2012

## 6. Outlook

Health is an important topic in PE curricula worldwide and is thus a field of action for PE teachers in PE classes and in everyday school life. The narrative review conducted in this research presents vivid research regarding professional knowledge, including CK, PCK, and OK, health-related beliefs, and the importance of PE teachers' personal motivation for a healthy lifestyle. Less is known about their self-efficacy or motivational orientations towards health-related PE, and self-regulation. The associations between PE teachers' health-related professional competence and pupil-level outcomes are theoretically formulated but rarely empirically investigated. Furthermore, it remains unclear how the individual subdomains of the elaborated heuristic model relate to each other. This would require clarification of terminology, more systematic literature analyses, and theory-based empirical studies. We hope that the proposed heuristic model of PE teachers' health-related professional compe-

tence, which is based on the normative notion of an 'alternative' health-related PE, provides a useful overview and guide for further studies in this field. It can also be used to critically examine existing PETE programs and develop health-related professional development programs as these are key to high-quality 'alternative' health-related PE (Alfrey et al., 2012; Castelli & Williams, 2007; Haerens et al., 2011; Santiago & Morrow, 2021; Santiago et al., 2012; Wright et al., 2018).

In terms of future research, we see the following desiderata: Clear theoretical references and a common terminology would help to classify existing research. Ideally, terms should be used that are familiar in professional research on (PE) teachers, such as CK, PCK, beliefs, motivation, or self-regulation (Baumert & Kunter, 2013; Shulman, 1987; Blömeke et al., 2015). The effects of PE teachers' health-related professional competence should not only be postulated theoretically, but also investigated empirically. This might help to prove the content of the proposed heuristic model and to adapt the model if necessary. In doing so, individual competence facets should be targeted at the teacher and pupil level.

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**Keywords:** Physical education; health; professional knowledge; teacher competence; conceptual framework

## **Gesundheitsbezogene professionelle Handlungskompetenz von Sportlehrkräften: Literaturüberblick und heuristisches Modell**

### **Zusammenfassung**

Im Sportunterricht können Schüler\*innen gesundheitsbezogene Kompetenzen für die Gestaltung eines bewegungsaktiven Lebensstils erwerben. Sportlehrkräfte spielen eine wichtige Rolle in der Förderung entsprechender Kompetenzen bei Schüler\*innen und benötigen dafür selbst spezifische professionelle Kompetenzen. In diesem Artikel werden in einem narrativen Literaturreview Forschungstrends aufgezeigt. Darauf basierend wird ein heuristisches Modell für gesundheitsbezogene professionelle Handlungskompetenz von Sportlehrkräften entworfen, das verschiedene Wissensbereiche, Überzeugungen, motivationale Orientierungen und Selbstregulation als relevante Subdimensionen beinhaltet. Es soll als Überblick und Orientierung für zukünftige Arbeiten dienen.

**Schlagworte:** Sportunterricht; Gesundheit; professionelles Wissen; Lehrer\*innenkompetenz; Rahmenkonzept

## **Compétences professionnelles liées à la santé des enseignant·e·s d'éducation physique : revue de la littérature et modèle heuristique**

### **Résumé**

L'éducation physique permet aux élèves d'acquérir des compétences en matière de santé afin d'adopter un mode de vie actif. Les enseignant·e·s d'éducation physique jouent un rôle important dans la promotion de ces compétences chez les élèves et ont besoin pour cela de compétences professionnelles spécifiques. Cet article présente les tendances de la recherche dans le cadre d'une revue narrative de la littérature. Sur cette base, un modèle heuristique de compétences professionnelles liées à la santé des enseignant·e·s d'éducation physique est élaboré, qui comprend différents domaines de connaissances, de croyances, d'orientations motivationnelles et d'autorégulation comme sous-dimensions pertinentes. Il doit servir d'aperçu et d'orientation pour les travaux futurs.

**Mots-clés :** Éducation physique ; santé ; connaissances professionnelles ; compétences des enseignant·e·s ; cadre conceptuel

## Competenze professionali legate alla salute degli insegnanti di educazione fisica: revisione della letteratura e modello euristico

### Riassunto

L'educazione fisica (EF) è uno dei contesti in cui gli studenti possono acquisire competenze legate alla salute per condurre una vita fisicamente attiva. Gli insegnanti di EF svolgono un ruolo fondamentale nel promuovere nei loro studenti tali competenze. Per rivestire appieno questo ruolo, essi stessi necessitano di competenze professionali specifiche. Questo articolo presenta le tendenze della ricerca sulla base di una revisione della letteratura. Su questa base, è stato sviluppato un modello euristico di competenze professionali legate alla salute per gli insegnanti di EF che include diversi ambiti di conoscenze, credenze, orientamenti motivazionali e autoregolazione come sottodimensioni rilevanti. Il modello intende fornire una panoramica degli aspetti chiave delle competenze menzionate e servire per orientare successivi lavori.

**Parole chiave:** educazione fisica; salute; conoscenze professionali; competenze dell'insegnante; quadro concettuale

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