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### The meaning of health-related physical activity in prevention and rehabilitation

A review of German speaking publications in 2010 and 2011

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This review comprises German monographs and anthologies as well as articles published in professional journals between the years 2010 and 2011. This article ties in with the reviews on 'Physical Activity, Sport and Health' published in the 'International Journal of Physical Education' between the years 2000 and 2010 (Knoll, 2000, 2002, 2004, 2006, 2008, 2010). The following professional journals were examined systematically: 'Sportwissenschaft', 'Spectrum der Sportwissenschaften', 'Zeitschrift für Sportpsychologie', 'Sport und Gesellschaft', 'Deutsche Zeitschrift für Sportmedizin', 'Bewegungstherapie und Gesundheitssport', 'Sportunterricht', 'Bewegungserziehung', 'Sportpädagogik', 'Motorik', 'Praxis der Psychomotorik' as well as 'Prävention'.

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#### ***1 Introduction: Basics***

Health related physical activity is an inherently variable topic within the field of sports sciences. Throughout the years it has become an established discipline and is discussed from various sport scientific perspectives. This is seen in accordance with developments in the German speaking realm and the increasing number of sport scientific congresses and conventions in this field. In coalition with researchers of various sport scientific disciplines, the Health Committee<sup>1</sup> of the German Union for Sport Sciences (dvs) sets the scientific standards for German speaking sport sciences through annual conventions and represents the continuity as well as the variety in the development of this area of research. Within this review period, two conventions<sup>2</sup> were held: "Quality in physical activity and health" in 2010, where the focus was on topics related to measurement quality and quality assurance in health related physical activity. In 2011, topics related to scientific transferability to health related physical activity were discussed at the convention "Kids in motion – bringing together scientific efforts". This convention was integrated into the field oriented "Kinderturnkongress"<sup>3</sup> at the Karlsruhe Institute of Technology.

At the initiative of the dvs Health Committee, topics pertaining to physical activity were also addressed at the German Union for Sport Sciences' 20<sup>th</sup> Sport Scientific Conference "Creativity – Innovation – Performance. Research moves SPORT moves research" (Hottenrott, Stoll & Wollny, 2011). Furthermore, in a first time cooperation with the task force 'Movement Therapy' (part of the German Society of Rehabilitative Sciences) the dvs Health Committee held a conference on the topic "Sport, movement and chronic illness" as part of the German Sports Medicine Convention 2011. A hot topic in the discussion at this convention was: "Is there enough movement in health care?" In addition to the diverse convention activities, the dvs Health Committee also dedicated efforts into addressing questions concerning the quality of education of sport science students aspiring to work in the health industry: An excellent summary of university programs in Germany for health related physical activity in sports sciences has been available since 2010 ([www.dvs-gesundheit.de/Studiengänge](http://www.dvs-gesundheit.de/Studiengänge)).

<sup>1</sup> See also [www.dvs-gesundheit.de](http://www.dvs-gesundheit.de)

<sup>2</sup> The publications for both of these conferences are expected to be available in 2012.

<sup>3</sup> A conference addressing topics related to physical activity and exercise directed towards children.

Alongside the dvs Health Committee, other sport scientific disciplines within the German Union of Sports Sciences have also discussed topics related to physical activity and health at various conventions in the past two years; for example, the collective symposium for biomechanics, motor learning and exercise physiology in 2010 which focused on health from a movement and performance perspective (Mattes & Wollesen, 2010). Of particular interest are the 2010 published proceedings (Kähler & Schröder, 2011) from the 2008 annual 'Sport Economy' task force convention on the topic "Economical perspectives of sport and health".

In addition, multiple professional conventions have taken place over the past few years which are directed particularly towards teachers (including pre-school), fitness instructors and trainers and aide in the effective transfer of the scientific understanding of physical activity and health into practical situations. Regarding children and youth, conventions were held in Karlsruhe (recently 2011 "Kids in motion – utilizing energy", Baadte et al., 2011) and Osnabrück (recently 2011 "Childhood in motion") which have established a sense of tradition and appeal to practitioners in kindergartens, schools, sports clubs and local communities. Also published within this review period is the documentation of the Osnabrück convention in the year 2008 on topics regarding "Education possibilities through movement – starting in early childhood!" (Hunger & Zimmer, 2010).

Alongside these conventions and anthologies, fundamental scientific articles have also been published within this review period that are particularly relevant to the area of physical activity and health. Based on a commentaried bibliography published in 2010 on physical activity and health (Waffenschmidt, 2010), Waffenschmidt (2011) put forward a bibliometric analysis on "physical activity and health in the conflicting areas of sports sciences, public health and health political requirements". This bibliography considers scientific publications of various authors residing in Germany which address movement related primary prevention and health promotion from the year 2000 to 2007. The bibliometric analysis is founded on the characteristics of productivity, publication style, role players, topics as well as formal aspects (language, impact factor, citation). A central finding of this study is therefore, "that this area is developing, increasing in professionalism and nurtures information exchange with other scientific disciplines. [...] Increasing influence from non-sport scientific role players could be indentified. [...] The study also confirms that the topics addressed by the analyzed publications are for the most part in agreement with the priority areas in health politics" (Waffenschmidt, 2011, p. 3). This bibliometric analysis presents an excellent overview for the thematic spectrum of the publications in the early years of the new century and shows that the meaning of physical activity also plays a role outside of the sports sciences; for example in related fields such as health psychology.

From the area of rehabilitation, the fundamental work by Hölter (2011) on movement therapy for psychological illnesses is noteworthy. In this publication, movement therapy is comprehensively explained as a clinical treatment method for psychological illnesses. Beginning with a representation of historical scientific fundamentals of this form of therapy, the connection between 'body and physical activity' is discussed as well as the theoretical fundamentals. Subsequently 'contours of a clinical movement therapy' are explained including diagnostics, direction of content as well as evaluation and differentiated into various methods according to disorder and age. This publication is not only an important reference for theorists of the sports and health sciences, but is also meaningful for therapists working in clinical institutions.

The anthology by Betz & Hottenrott (2010) was also published within this review period which addresses aspects of health oriented training with children and youth and presents mainly medical, natural science related articles on health, performance and resilience of children and youth.

The publications discussed up to this point concern general topics in the field of physical activity and health. The following will point out articles that focus on diagnostics, parameters and characteristic of health related physical activity (chapter 2). Effects of health (chapter 3) and health oriented physical activity with children and youth (chapter 4) as well as adults and seniors (chapter 5) will also be discussed prior to a short outline on future perspectives of sport scientific research (chapter 6) to close.

## **2 Health related physical activity: Diagnostic, parameters and characteristics**

Within this reporting period, a series of publications appeared that, in addition to thoughts on various characteristics of health related physical activity, also discuss questions regarding diagnostics and determining factors of sportive activity, i.e. influencing factors on an individual as well as collective level.

### *Diagnostic and health related physical activity*

This review period also presents a series of articles concerning questions related to diagnostics. For example, Ziemainz & Peters (2010) present an overview on instruments for measuring the current status of well-being of individuals participating in health related physical activity. In a critical re-

view, five different questionnaires used for this purpose were systematically and comparatively examined according to theoretical basis, structure and quality criteria. Subsequently, recommendations for implementation are given. Trampisch et al. (2011) look at the suitability of using questionnaires for acquiring information regarding everyday physical activity of older adults. Müller, Winter & Rosenbaum (2010) demonstrate which objective (i.e. subjective) style of procedure can be used to measure everyday physical activity in research. This work group also examined the accuracy of movement sensors, an instrument increasingly being implemented in physical activity related studies, when used with children and young adults (Müller et al., 2011). In the area of performance diagnostics for the cardiovascular system, the article by Scheld et al. (2011) on the testing of implementation possibilities of 6-minute walking test for patients with heart problems is noteworthy. Measurement and analysis procedures on variability of heart frequency is discussed in the context of health promotion within the framework of an international symposium in 2010 (Hottenrott, Hoos & Esperer, 2011) as well as in a journal article by Schega et al. (2010). In the area of strength diagnostics, the article by Marschall & Gail (2011) is noteworthy. In this study, a standardized and evaluated test protocol for the consideration of important influencing factors on isometric muscle strength is presented that is suitable for trained recreational athletes. Theisen & Wydra (2011) developed a motor skill test, the GGT-Reha, for testing static and dynamic balance in the area of sports therapy.

#### *Parameters of health related physical activity*

In designing health related physical activity programs, the parameters play a fundamentally important role – i.e. the question, if and under which conditions an individual decides to start taking part in health promoting physical activities. In this regard, the dissertation by Niermann (2011) is worth mentioning which, in three empirical studies, examined questions surrounding how willingness and behavior processes when it comes to physical activity and nutrition can be measured. Niermann (2011) also looked at the relevance of an effective self control for participation in physical activity and how this can be specifically targeted in health promotion. With an intervention study ‘MoVo-Lisa’, Fuchs et al. (2010) show how these subject areas can be implemented in therapeutic practices. ‘MoVo-Lisa’ is a psychological intervention program directed to support “building up and maintaining a physically active lifestyle following a stationary rehabilitation” (Fuchs et al., 2010, p. 270). In this regard, this program is not only directed towards strengthening motivation, but also volition, meaning the program is directed “towards promoting self control, allowing intentions alone to actually lead to behavior change” (Fuchs et al., 2010, p. 270). To test the effectiveness of this treatment, 220 participants at a stationary orthopaedic rehabilitation centre were examined within a quasi-experimental scientific design. In relation to physical activity and health issues one year after cessation of treatment at the clinic, the results of this methodical founded study show convincing evidence that a standardized and comparably affordable program “can contribute to the development of a sustainable physically active lifestyle” (Fuchs et al., 2010, p. 270).

The predominantly studied population groups and the corresponding specifically designed programs, for example a predominant type of illness and the associated symptoms, is supplemented by Sudeck, Lehnert & Conzelmann (2011). In this study, the individual goals and motives were considered as criteria for the program design in order to work against high drop out rates in health related physical activity courses. To differentiate between so-called ‘motive-based types’, 228 participants were examined regarding their physical, health related and psychological characteristics as well as their physical activity behaviors. Based on these results, different ‘motive-based types’ could be identified, who conceptually should take part in specifically designed physical activity programs. Keeping in mind the differentiation of various ‘motive-based types’, Sudeck & Conzelmann (2011) examined in a quasi-experimental study the extent to which a custom physical activity program for each identified type influences the various aspects of state of being in the participants. Despite methodical limitations, the results suggest the relevance in taking the various motives into consideration when systematically designing physical activity programs.

In contrast to the listed articles addressing health behavior change, other articles, such as Rütten & Frahsa (2011) and Rütten, Frahsa & Abu-Omar (2010), focus on adjusting an individual’s social environment in relation to physical activity. Rütten & Frahsa (2011) present thoughts on theoretical conceptualization of social conditions affecting participation in physical activity as a main goal of health related physical activity. In a case study example from the field of intervention (at a ‘women’s only’ swim time at a municipal indoor swimming pool) the factors are “discussed that could make a change of social environment possible, leading to an improvement in physical activity related health promotion” (Rütten & Frahsa, 2011, p. 16) for women in difficult life situations (e.g. for muslim women in Germany). According to the authors, consequences for intervention research arise from this theoretical approach, in particular for future planning of intervention studies which will have little to do with the conventional “orientation on a randomized, controlled experimental de-

sign". Rütten, Frahsa & Abu-Omar (2010) give an overview on political and infrastructural approaches in health promotion directed towards specific population groups and, in view of the status of international research, summarize the "scientific evidence regarding the connection between politics and infrastructure and physical activity" (Rütten, Frahsa & Abu-Omar, 2010, p. 18). The authors formulate the conclusion by outlining the international evidence base: "Whereas the current sport scientific discussion surrounding 'health promotion through physical activity' are primarily directed towards the development of physiological and psychological health resources and the self defined core areas for intervention, 'health related physical activity' and 'movement therapy' are concentrated on behavior changes, the evidence regarding 'social conditions affecting health promotion of physical activity' found in many scientific studies has lead to a new focus in international public health discussions towards the development of political infrastructural parameters for physical activity" (Rütten, Frahsa & Abu-Omar, 2010, p.29). From the authors' point of view, there is a lack of "appropriate conceptualization of physical activity promoting conditions as well as an operationalization of these conditions – not only within empirically based research, but also in a sport related health promotion practice" (Rütten, Frahsa & Abu-Omar, 2010, p.19). On this basis, Rütten, Frahsa & Abu-Omar report on results of an ongoing research project which "attempts to identify criteria of good practice for the development of infrastructures for health promotion in a European context" (Rütten, Frahsa & Abu-Omar, 2010, p.18) and outline guidelines for the implementation of the corresponding measures to be taken.

#### *Characteristics of health related physical activity*

In view of the various types of physical activities, endurance training continues to be the primary method of fitness training in health related and rehabilitative physical activity. The importance of endurance training for physiological and psychological health has been proven (e.g. Knoll, 1997; Knoll, Banzer, Bös, 2006). For this review period, publications by Rösner (2011) and Scharhag et al. (2011) are noteworthy. As in previous review periods, the relevance of strength training has also been addressed in publications of the past two years. In this regard, König et al. (2011) present an overview on the current research on the effects of strength training for individuals with Diabetes mellitus type 2 and the resulting recommendations for physical activity programs. The effects of strength training in relation to back problems were examined by Stephan, Goebel & Schmidtbleicher (2011).

With results on "health promotion in a university setting", Möllenbeck (2011) presents information on the increasing prevalence and effects of physical activity for university students and therefore addresses a population group that has hardly been looked at in the area of health related sport sciences. The cross-sectional survey of more than 4000 students at the University of Göttingen presents an abundance of descriptive data on the health status and physical activity behavior of the students. A scientifically relevant answer to Möllenbeck's (2011, p. 143) main research question, "to what extent does physical activity of students contribute to health promotion and represent a health promoting factor", cannot be derived due to the cross-sectional nature of the study.

In addition, three publications (Mayer, 2010; Mayer & Thiel, 2011; Thiel, Mayer & Digel, 2010) are also noteworthy, which discuss the topics of health and elite sports and how they are connected – an aspect that has hardly been addressed from a health related physical activity perspective.

### **3** *Effects of health related physical activity*

The relevance of physical activity as an influencing factor for health and subjective well-being is the initiating factor of the conceptualization of health related physical activity programs.

Based on the evaluation of existing results from randomized, clinical studies, König (2011) presents the effects of medicinal interventions as compared to physical activity. By exemplifying arteriosclerotic related illnesses, he could show that physical activity can contribute substantially to risk reduction, being comparable to medicinal therapies.

The importance of movement therapy in clinical rehabilitation of children and youth and to what extent expert recommendations are being applied was examined by Ahnert et al. (2011). The authors show that the spectrum of the applied movement therapy for a corresponding illness of children and youth is relatively large and, in order to be in compliance with current therapy guidelines, standards should be improved.

In his review article, "Serious games in prevention and rehabilitation", Wiemeyer (2010) discusses an area that has hardly been examined in health related physical activity research. 'Serious games' are meant to be understood as digital games (computer and video games), which are implemented as 'exergames' or 'games for health' for the purpose of health promotion (Wiemeyer, 2010, p. 252). Wiemeyer recognizes a great preventative potential in such games in which, for example, meaningful increases in energy expenditure or improvements in preception and coordination abilities could be made.

As in the past year, publications that focus on the area of secondary prevention through physical activity focus on cardiovascular related illnesses (among others, Coll Barroso et al., 2011). Noteworthy are the articles from Lakämper (2011) on the EvaPlus-Project for women in cardiovascular rehabilitation (a project that combines health awareness programs with physical and expressive therapies) and the study by Nitsche, Sickert & Schulz (2011) on the structure of health promoting 'heart groups' in the area of Chemnitz/Germany.

Aside from the leading cardiovascular illnesses observed in morbidity statistics, other selected medical conditions and the extent to which they can be influenced by movement and/or sports therapy have been taken into focus, such as overweight and obesity. Huber (2010a) demonstrates in his overview article that lack of physical activity counts as a central factor influencing the development of obesity as well as indicating which epidemiological parameters are relevant. With the support of international research, it can be confirmed that "from the three known significant factors that influence body weight,... it is neither the individual metabolism nor nutrition, rather the consistent decline of physical activity that is responsible for the increasing numbers of overweight and obese people" (Huber, 2010a, p.50). Huber comes to the conclusion that "the role of nutrition in discussions about obesity is strongly overestimated; the role of movement is therefore to the same extent underestimated" (Huber, 2010, p.50). On the methodical, statistical level, Bucksch & Schlicht (2010) address the question if mortality risk for people who are overweight as well as for those in a normal weight range can be reduced through physical activity. The authors come to the following results: "If people who are of a normal weight and those who are overweight follow the established activity recommendations, the risk to die early will sink" (Bucksch & Schlicht, 2010, p.72). Using the example of a twelve month physical activity oriented patient awareness program, M.O.B.I.L.I.S (multi-centre organized physical activity related initiative for lifestyle changes in personal responsibility; running in Germany since 2004) which implements seminars on nutrition and behavior change as well as 40 physical activity units, Berg et al. (2010) and Frey et al. (2010) demonstrate the success that can be experienced in weight reduction in obese adults (see also Baldus, Huber & Lagerstrom, 2010; Huber, 2010b with publications to special intervention programs). The study by Kemmler, Birlauf & von Stengel (2010) examines the influence of electromyostimulation training in participants with metabolic syndrome.

Another focal point for this review period is the physical activity related publications on medical conditions and illnesses involving the spine. In this regard, Schröder & Färber (2010) developed "segmental stabilization training as a building block of an evidence-based movement therapy for back conditions". Kleinert & Raven (2011) show how the locus of control can change for individuals with back pain when involved in sport therapeutic programs. Niesen-Dietrich et al. (2010) examined the effects of comparable strength and endurance training programs on fitness level, overall health and back pain.

Areas that have been less explored in the past were addressed by; for example, Baumann & Bloch (2011), Rösner (2011), Wittmann et al. (2011) on the influence of physical activity and tumor related illness, Wolfsegger et al. (2011) for autoimmune diseases, Bühlmeier & Alt (2010) for Parkinson's disease as well as Deibert et al. (2010) on physical activity and liver diseases.

#### **4 Health related physical activity with children and youth**

In the area of health related physical activity with children and youth, several articles have been published within this review period that address topics such as motor performance ability, sportive activity and health of children and youth.

In an overview article, Krombholz (2011a) outlines the results on health and motor performance ability in children. For this purpose, the author refers to data from a Germany wide child and youth health survey (KiGGS-Study) 2006. Using data from this nation wide survey, i.e. from the so-called 'Motorik-Modul' (MoMo – sub-study of KiGGS), Tittlbach et al. (2010) evaluate the results with the focus on the following question: "Is there a difference in the health of physically inactive children and youth who participate in a high rate of physical education (more than two units a week) and physically inactive children and youth with a low rate of physical education in school (less than and including 2 units a week)?" (Tittlbach et al., 2010, p.121). Based on data from 310 inactive children and youth, the results show "no significant difference between both groups concerning the examined health parameters" (p.123). The health parameters examined included physiological and psychological health resources, physiological and psychological stress symptoms as well as overall health. The authors come to the conclusion that the "potential effects of physical education the health parameters can only be expected when quantitative loading and qualitative program design of the activities is specifically planned – meaning that physical education classes must be planned systematically as a health oriented physical activity program" (p.125). The authors therefore recognize that this is not the primary purpose of physical education in schools.

The question if and in what way motor performance ability has changed across past generations continues to be controversially discussed. Krombholz (2011b) specifically examines the question, if motor performance in boys and girls aged three to seven has decreased between the years 1973 to 2001. For this purpose, he was able to refer to data from three fitness tests from a coordination test (KTK) for children by Kiphard & Schilling (standing long jump; balancing backwards; jumping back and forth). Contrary to popular belief of regressing motor performance ability of future generations, Krombholz could not identify a decline of motor performance ability, also not when comparing each gender. Bös, Krug & Schmidt (2011) chose to implement a retrospective questionnaire, asking adults about their physical activity. In this study, various differences could be identified between elementary school aged children today and past generations (e.g. in acquiring motor competencies).

On multiple topics for health promotion in educational institutions, articles by Engelhardt & Halle (2010) for pre-school as well as Kleiner (2010) and Behrens (2011) for grade school are noteworthy for this review period. With the focus on grade school, Kleiner (2010) addresses the question of what effect does the lesson 'movement and sport' have on health and what sustainability can be attained for extracurricular physical activity behavior, as well as for beyond the school aged years? Behrens (2011) presents thoughts on the importance of physical activity for the health of children and pleads for an expanded understanding of physical activity in a school setting that is not only limited to sport disciplines in physical education, rather increasingly includes new trends in sports.

As mentioned in the previous review, the topic of 'Learning in Motion' is the focus of various sport scientific studies and addresses children and youth in particular. For example, Krüger (2010) presents results of an evaluation for a teaching concept directed towards promoting learning success in the subject of biology through 'Learning in Motion' for junior high and high school students. The results show that students taking part in the 'Learning in Motion' program could demonstrate higher motivation to learn, better concentration and an above average performance in written examinations on course content. A limiting factor to this study, however, is that no control group was taken into consideration. Concerning this area of research, it can be stated that there is an overall inconsistency of results from existing studies. In this regard, a representative study ( $N = 552$  students; 14 classes each for the treatment and control groups; grades 3, 4, 6, 8 and 10) by Fessler, Stibbe and Haberer (2008, cf. also Fessler & Haberer, 2008) on the effects of 'Learning in Motion' on concentration showed no significant results between treatment groups that received more physical activity (in the form of a 'movement break' during lessons) and the control groups without any additional 'movement breaks'. The authors attribute this to inadequate examination methods, stating that "convincing intervention studies supporting the effects of physical activity on willingness to learn, learning ability and performance need to be more demanding than in previous studies, namely as long term, longitudinal studies." In view of the existing scientific results on 'Learning in Motion', the results need to therefore be viewed conservatively, without doubting occasional effects that physical activity can have on learning performance or cognition.

By including physical activities in the everyday at school, questions arise concerning coordinating the school day through planned rotations of classroom lessons and recreation time, of phases of concentration and relaxation - the basis for an overall healthy development of the students. An entire issue of the journal 'Sportunterricht' (the information medium of the German Physical Education Teachers Association) is dedicated to the question: "Relaxation training in schools?" (issue 6/2011, vol. 60). Of particular interest is the article by Fessler (2011), with conceptual reflections and theoretical models outlining relaxation techniques for children and youth and the implementation in the school setting. Schwarz & Budde (2011) bring up health related thoughts on "directing awareness and consciously being relaxed" and Opper & Petermann (2011) introduce possibilities of "relaxation in schools with Qigong". Specific practical tips on yoga are given in this issue by Fessler & Geiser (2011), on massage techniques by Müller & Müllerschön (2011) and on stretching by Haberer (2011).

In addition to the articles presented on primary prevention, there have once again been articles published within this review period which focus on secondary prevention. These publications address various illnesses in children and youth and the influence of physical activity. In regards to overweight and obesity, the physical activity program 'SafariKids on Discovery Tour' by Wagner (2010) is noteworthy. This program is a resource oriented physical activity program for the prevention of overweight children, which was developed for application in sports clubs. This twelve week physical activity program is combined with a nutrition program, consists of a 60 minute unit every week and addresses children between the ages of eight and twelve, also including their parents. Walter et al. (2010) present a pilot study on the effects of "multi-modal outpatient care on lifestyle factor of obese children". The results show that "through a specified, structured and supervised afternoon program, significant improvements in motor performance ability and BMI" (Walter et al., 2010, p. 9) could be reached. The weight reduction, however, was quite low, which the authors attribute to

the short duration of the intervention program. Changes in health related quality of life could not distinctly be proven and are subject to gender specific influences. A further study by Gröne-Bentz (2011) addresses the effects of additional weekly physical activity units for overweight and obese children in remedial physical education on their motor performance ability. It could be demonstrated that the intervention program is more effective when implemented in groups of individuals of equivalent performance level as when the groups are heterogeneous relative to performance level.

Hofmann & Tietjens (2010) address the research status for physical activity with children and youth with types of cancer, a group which has only marginally been considered in research. Based on an evaluation of current research concerning the importance of physical activity for this relatively small population group, the authors present the concept of a 'mobile trainer', a person who would develop sport specific intervention methods and who would also act as an advocate for family, physical education teachers, sports clubs and doctors.

From the many practical tips for designing physical activity programs, is the anthology by Sepp (2011) exemplary, which is presented with the heading "seriously active" as 90 units for physical activity in a group fitness room or swimming pool for children between the ages of eight and twelve who are obese. Secondly, the anthology by the German Youth Gymnastics Association (2010) is also noteworthy, which describes the use of adventure stories for informing children of 'healthy nutrition' during physical activity programs.

### **5 Health related physical activity for adults and seniors**

Physical activity, fitness and health are being increasingly addressed as central elements across an individual's lifespan from a sport scientific point of view (cf. Knoll & Woll, 2008). For this review period, a large portion of the publications take the older adult population into consideration. From a gerontology point of view, Kalinowski, Wulff & Dräger present thoughts on a resource-analysis model for physical activity promotion in care homes for older adults. Publications by Geuter & Holleederer (2011) as well as Späker (2011) address aspects of physical activity across one's lifespan. Whereas, Geuter & Holleederer (2011) draw on literature based research to give a brief overview and recommendations for the type and extent of health promotion for older adults, Späker (2011) presents thoughts on designing movement related health promotion programs for this population. Taube et al. (2010) examined the effects of inline skating on balance ability, an activity hardly researched in the area of physical activity and older adults.

Of particular importance during this review period was the topic of fall prevention on older adults, for which balance capabilities are vital. Considering demographic tendency and the growing group of older adults, this topic has much momentum (cf. Freiberger, 2010). Freiberger & Spies (2010) present the results of a field study on the effectiveness and sustainability of an evaluated fall prevention program in a communal setting. In this study, significant improvement in strength and balance ability could be identified as central factors in decreasing the risk of falling, which also had positive effects one year after treatment. The study by Kemmler et al. (2011) is particularly interesting, which examined the influence of an 18 month training program for various risk factors and illnesses (e.g. cardiovascular risk, fall frequency etc.) of older adults and simultaneously looked at health related costs. While a 'middle to high effectiveness' of the program could be shown for the riskfactors (i.e. illnesses) no significant effects were demonstrated in relation to health costs (Kemmler et al., 2010, p. 267). Among other things, the authors attributed this to the heterogeneous group of participants. In a carefully planned twelve week intervention study, Illig & Pfeffer (2010) examined to what extent a one time weekly health related physical activity program would influence the motor and cognitive regression processes in older adults. Although the treatments clearly lead to improvements in motor abilities, cognitive function ability could not be improved. According to the authors, it is "still unclear which type of physical activity leads to the most meaningful effects" (Illig & Pfeffer, 2010, p. 113).

From a so called 'Motogeragogik'<sup>4</sup> point of view, publications on health oriented approaches to physical activity promotion with older adults are admirable. For example, the article by Eisenburger et al. (2011) on aspects of documentation and quality development in 'Motogeragogik', Drastik-Schäfer (2011) on the implementation of psychomotor content for residents in retirement homes and care homes for older adults as well as by Eisenburger (2011) on psychomotor programs for adults with dementia. Two review articles address the role of physical activity in preventing dementia. Based on the evaluation of international studies, Bostelmann & Eidenschink (2011) consider the preventative effectiveness of physical activity to be proven, while Eichberg (2011) comes to a much

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<sup>4</sup> 'Motogeragogik' (i.e. pedagogics of gerontology in the sports sciences) is a field of study in the German speaking realm directed towards personal development and improvement of quality of life through physical activities for older adults.

more apprehensive appraisal: “to claim that movement and sportive activity would reduce the symptoms of dementia and delay the onset of the disease or even prevent it, would be overexaggerated according to the the current research. A reason for this, is the minimal evidence regarding the influence of physical activity across an individual’s lifespan” (Eichberg, 2011, p. 8).

Practical oriented publications for health related physical activity as an older adult were brought forth by Reuß (2010), who presents a fitness training program for seniors 60+, and the German Gymnastics Association (2010) on fall prevention for older adults. The publication by Jasper & Regelin (2011) is also noteworthy, which focuses on people with dementia.

## **6 Future perspectives**

In summary, it can be stated that, as in the past years, German-speaking sport scientific research in health related physical activity has focused predominantly on the determinants of health related physical activity as well as the development and evaluation of such programs. Prominent, however, is that in comparison to past years, a stronger focus has been placed on physical activity for older adults. In addition, promising topics which received less attention in the past were examined; such as the concept of designing programs according to the ‘motive structure’ of the participants, the importance of physical relaxation for various population groups in various settings or the implementation of new types of media (e.g. the ‘serious games’). Once again, the area of diagnostics for various population groups was a focal point. However, researchers must put even more emphasis on implementing methodical proven test instruments in the evaluation of intervention programs in the future. This also applies for the assurance of quality standards for health related physical activity programs through the appropriate quality management. This should also be more of a priority in future research, so that health promoting physical activity programs can be implemented with more confidence as a vital building block when designing programs and considering measures to be taken towards health promotion and prevention. It becomes clear in this review that not only do the individual health behaviors need to be considered in public health measures, but more attention should be directed towards aspects of the social environment enabling one to take part in health promoting physical activity in Germany.

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