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CONTENT

Abstracts of keynote speakers

Section: Built environment and physical activity for transport: Oral presentations

Section: Built environment and physical activity for transport: Poster presentations

Section: Physical activity preferences and existing physical activity intervention: Oral presentations

Section: Physical activity preferences and existing physical activity intervention: Poster presentations

Section: Strategies, approaches and impacts of physical activity promotion: Oral presentations

Section: Strategies, approaches and impacts of physical activity promotion: Poster presentations

Section: Technology in physical activity and health: Oral presentations

Section: Technology in physical activity and health: Poster presentations

PREFACE

Dear colleagues!

We are honored by your visit to our Faculty of Physical Culture on the occasion of our traditional "Movement and Health" conference. Interestingly, it has only been twenty years since our faculty was established. The answer to the question of whether this time is long or short, is very relative. It depends on the quality of work and the quantity of success achieved. Although the activities of our faculty are aimed in various directions, one idea is common for all – our general orientation on the relationships between a human's movement and his/her health. This orientation is from the beginning of our faculty respected. The conference "Movement and Health" is always aimed at specific problems which are the leading representative of this orientation. We are very satisfied that they evoke the hopeful feedback from the scientific world.

So, this year's conference is the sixth, and it is the contemporary effect of our long term work, to which many colleagues have contributed. At the head of the preparation and on the leadership of the conferences were many colleagues of our faculty.

However, if we are speaking about the success of our conferences, it is also necessary to speak about our guests. The preparation of some event can have potential, but without the quality of its guests, its success is not possible. That is why we can state, with satisfaction, that we have always had the honor to welcome many respected colleagues from around the world. Many of these guests are in collaboration with the significant national as well as international organizations, and this important international cooperation also started due to these conferences.

We are also very glad and honored that in this year we have the opportunity to welcome the important representatives of many institutions and the representatives of respected organizations. We hope that your stay in Olomouc and at our Faculty of Physical Culture will be pleasant and successful.

In conclusion, we would like to express one great ambition – to transfer our scientific knowledge in practical forms and to really contribute to the health of the whole population.

prof. PhDr. Bohuslav Hodaň, CSc.
(First Dean of the Faculty of Physical Culture, 1991–1997)

Abstracts of keynote speakers

BUILT ENVIRONMENTS AND PHYSICAL ACTIVITY: INTERNATIONAL RESULTS

James F. Sallis

San Diego State University, San Diego, USA

Concerns about the health impacts of communities designed to support travel by automobile arose first in the United States and Australia because so many people were exposed to low-walkable environments. Decades of transportation research showed that people walked and biked less for travel when they lived in low-walkable environments. More recent research conducted by teams of health and transportation investigators confirmed that low-walkable environments are linked with less total physical activity, higher rates of overweight/obesity, and other health problems. Automobile-oriented low-walkable development patterns and transportation systems have been spreading throughout Europe, Asia, and South America, though the dominant community design is still walkable. It was unclear whether the health effects of walkability applied to all parts of the world until recently. Studies conducted on virtually every continent now indicate that walkability and its components are related to physical activity. One international study conducted in 11 countries confirms the global relevance of the built environment factors for physical activity. The next step in international built environment research is to identify specific modifiable environmental factors that are related to health outcomes in multiple countries and use the data to inform public policy makers how to design more health-promoting communities. The IPEN study (International Physical Activity and Environment Network) is conducting a coordinated international study of at least 13 countries using both objective and perceived measures of environments and physical activity. In addition to advancing the science we will use the results to advocate for policy changes in national and international agencies.

PHYSICAL ACTIVITY AND PREFERENCES WITHIN THE CZECH POPULATION: EASTERN EUROPEAN SPECIFICITIES

Josef Mitáš

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Central and Eastern European countries belonging to the former "Communist bloc" exhibit specificities (often as anomalies) due to certain unique built and socio-economic environments, which should not be ignored in research and preventive measures on physical activity. To avoid easily predictable negative aspects in the development of the populations' health, it is important to evaluate associations between gender, age, occupational classification, education and lifestyles in different conditions and environments. Simultaneously it is necessary to understand the needs and preferences in physical activity across the population and to maintain specific features of the environment.

In the Czech Republic, socioeconomic levels still do not vary greatly in the general population. In residential areas, there still remain large single land uses, dominated by prefabricated or newly built apartment blocks.

The aim of this lecture is to describe physical activity levels and preferences in residents of the Czech Republic in association with the features of both the socio-economic and a built environment. These analyses and comparisons with more developed countries may provide evidence for decision makers, local authorities and government institutions in the post communist countries to inform national health policies.

Physical activity of the population in all regions of the Czech Republic seems to be balanced. Residents of smaller communities are consistent in having active lifestyles and people are encouraged to maintain a high level of the walkability within their neighborhoods and have reported the highest level of total weekly physical activity.

TOPIC AREA: STRATEGIES AND APPROACHES ON INTERNATIONAL, NATIONAL AND REGIONAL LEVEL

Brian Martin

Institute of Social and Preventive Medicine, University of Zurich, Zurich, Switzerland

The abstract has not been provided by the author.

ARE WE FOCUSING TOO MUCH ON THE "NEW TECHNOLOGY" AS THE SOLUTION TO SURVEILLANCE?

Adrian Bauman

School of Public Health, University of Sydney, Sydney, Australia

Physical activity assessment, especially at the population level, has been an area of resurgent interest. A scientific and biomedical paradigm has infiltrated traditional public health surveillance, and population studies using objective measures of activity are now more often reported, especially in the scientific literature. These include population estimates based on pedometer or accelerometer counts, and provide objective, and usually much lower estimates of "sufficiently physically active for health" than concurrent estimates derived from self reported physical activity. In addition, interest in the application of technology to physical activity assessment has increased, ranging from GIS, GPS and other ecologic level measures, through to innovative methods of individual level assessment. These include new devices attached to individuals, or through ways of contacting and monitoring individuals to assess moment to moment measurement.

Despite the focus on technology and innovation, many of the traditional principles of a surveillance system have been lost. Innovation can create new ways of measuring activity, but historical trend information may then be lost, and policymakers become confused regarding the prevalence, trends and importance of inactivity in their region. Other elements of a comprehensive surveillance system, including monitoring policy and professionals, monitoring schools, worksites, municipalities and other settings are becoming less frequent. Less effort is focused on assessing community wide implementation and reach of evidence based physical activity programs, or these approaches are considered less important. The need to return to, and improve on true physical activity surveillance systems, and adherence to using established measures across serial surveys for many years is an essential part of understanding the patterns of physical activity within and between countries, and over time.

MOVEMENT, CYCLING AND DANISH INSPIRATION

Jaroslav Martínek

Transport Research Centre, Olomouc/Brno, Czech Republic

"Prolong your life – be active!" – it was the topic of this year's European week of mobility (September 16th–22nd 2010). Again we could focus on the blind spot of our civilization – too little of regular movement, which implicates obesity and civilization diseases. People grew lazy, more and more are using their cars, less and less are walking, our lifestyle is sedentary, we are not physically active.

The European mobility week campaign promoted everyday physical activity (walking and cycling as suitable modes of transport). Non motorized movement is easy and everybody can easily integrate it in its daily life, it is almost for free, just a bit of determination and efforts are necessary.

This goes in hand with the efforts of all EU member states which aim at improving mobility, reducing traffic accidents, decreasing congestions and protecting air quality. All these aspects are linked to healthier lifestyle. Support of cycling transport, mainly the daily bicycle, use can considerably help these goals to be met. The Czech Republic endeavors for development of the potential cycling and walking have while inspiring also from the example of Denmark as the leading bicycling country.

PHYSICAL ACTIVITY INTERVENTIONS – EVALUATION, EXAMPLES OF GOOD PRACTICE

Fiona Bull

The University of Western Australia, Australia

The abstract has not been provided by the author.

PHYSICAL ACTIVITY AND ITS ECONOMIC IMPACT ON PUBLIC HEALTH

Michael Pratt

Centers for Disease Control and Prevention, Atlanta, USA

Public health is relying more and more on systematic evidence based approaches to guide policy and practice. Economic analyse are a key part of evidence based public health practice, providing estimates of boht economic burden of deseases and helat behaviors such as physical activity, and providing a basis for comparing and valuing alternace intervention strategies. Economic burden analyses contribute to answering the question “Does it matter?” While cost effectiveness analyse suggest answer to the following questions “What should we do?”, “Does it work?” and “Is it worth it?” Despite the value of economic analyses in guiding public health prevention strategies related to physical activity, there is a relatively small body of scientific literature on the economics of physical activity. In the presentation we will address the role of economic analyses, identify issues related to bringing together disparate fields of economics and public health, review existing drawing especially upon reviews conducted and tools developed in the Americas and Europe, and suggest next steps for public health practice and research.

PLAYING FOR REAL: VIDEO GAMES FOR CHILDREN'S DIET AND PHYSICAL ACTIVITY CHANGE

Tom Baranowski

USDA/ARS Children's Nutrition Research Center, Baylor College of Medicine, Houston, Texas, USA

Most obesity prevention programs have had little or no effect. Physical activity and dietary change programs also have generally had small effects, if any. Innovative procedures are needed to turn this situation around. Video games offer promise of enhancing intervention effects by capturing childrens' attention through immersive stories, offering fun as an incentive to play the games, and exposing them to diverse behavior change procedures inserted into the game experience. This presentation will describe "Escape from Diab" and "Nanoswarm: Invasion from Inner Space", two obesity prevention games, which have been demonstrated to influence dietary intake in a pilot study. A brief overview will also be provided about our several other video game projects. Substantial research is needed to learn how optimally to design video games to minimize health related behavior changes.

Section
Built environment and physical activity for transport

Oral presentations

BUILTE04

ASSESSING THE POTENTIAL FOR INCREASING WALKING TO WORK IN ENGLISH EMPLOYEES: PRELIMINARY ANALYSIS OF THE BASELINE WALKING WORKS EMPLOYEE SURVEY

Emma Adams

School of Sport, Exercise and Health Sciences, Loughborough University, Loughborough, United Kingdom

Background: Walking for the daily commute provides an opportunity to increase physical activity levels, particularly amongst sedentary individuals. Despite this, only 10% of UK adults currently walk to work. "Living streets' walking works" project aims to increase the number of employees who walk for part or all of their daily commute.

Objective: The primary aim is to assess the potential for increasing commuter walking in organisations participating in the "Walking works" project. Employees and their current commuting habits will be characterised and factors that might influence commuter walking will be explored.

Methods: An on-line survey was sent to employees in 4 organisations participating in the "Walking works" project (n = 4,412); 1,110 employees completed the survey (25% response rate). The survey assessed employees' demographics; current commuting behaviour; daily minutes of walking to and from work; overall physical activity levels; barriers to walking to work; perceptions of workplace support for walking; and perceptions of the walking environment around the workplace. Preliminary descriptive analyses were undertaken to characterise respondents and their current travel behaviour, and to assess factors influencing mode of travel to work.

Results: Respondents were female (69.0%), aged 36.7 ±11.0 years and white (91.5%). Most were in good health (85.2%) though over half were overweight or obese (52.9%). One fifth (20.8%) of respondents met current physical activity recommendations and only 16.3% walked for part, or all, of the journey to work on at least 5 days of the week. In contrast, 36% used the car. Of those that did any walking for the daily commute, respondents walked 13.4 ±11.7 minutes per day to work and 13.8 ±12.4 minutes per day from work. The most frequently reported barriers to walking to and from work were living too far away (50.3%), it taking too long (36.8%), not having time (32.0%) and it being more convenient to use a car (31.4%). Over half of respondents disagreed there was convenient public transport for travel to work (54.7%) and only 47.4% agreed the area within 10–15 minutes walk of the workplace was pleasant for walking. Only 4.2% of respondents received regular support from their colleagues to walk to work.

Conclusions: There is potential to increase walking to and from work and thereby increase individual physical activity levels. Individual, social and environmental factors within and outside the workplace may need to be addressed to support walking for the daily commute.

Keywords: Walking, active travel, physical activity, workplace.

ACKNOWLEDGMENT

The evaluation of the "Walking works" project is funded by "Living streets", London, UK.

BUILTE12

NEIGHBORHOOD FACILITIES AND GREEN SPACE ARE RELATED TO WALKING AND CYCLING IN FRENCH ADULTS

Hélène Charreire, Paul Salze, Romain Casey, Emmanuelle Kesse-Guyot, Arnaud Banos, Dominique Badariotti, Christiane Weber, Basile Chaix, Serge Hercberg, Chantal Simon, Jean-Michel Oppert

UREN – Unité de Recherche en Epidémiologie Nutritionnelle, Paris, France

Background: There is a need for studies on the relationship between a built environment and physical activity in different European contexts.

Objective: The aim of this study was to investigate the relationships of walking and cycling behavior with built environment characteristics including access to neighborhood facilities and green space in French adults.

Methods: Subjects were participants in the SU.VI.MAX study (Hercberg, 2004) living around Paris: 603 men (64.9 ±4.7 year), 706 women (62.9 ±5.3 year). Leisure walking and cycling data were collected in 2007 using the Modifiable Activity Questionnaire (mean 2.4 hours/week in men, 2.2 hours/week in women). Using GIS, we assessed home based potential spatial accessibility to facilities in the proximity (destination density), the availability of cycling paths around one's home address and accessibility to green space. Based on these built up environmental variables, cluster analysis was used to identify different types of environment. Associations between environmental clusters and walking and cycling were assessed with multinomial logistic regression.

Results: Walking and cycling (hour/week) were summed up and categorized in three classes – not performed (referent class), below or over the median weekly duration. Seven different built environment clusters were identified. After adjustment for individual (age, gender and educational level) and neighborhood characteristics (median tax income), significant associations were observed between walking and cycling and neighborhood patterns. Compared to a cluster characterized by the absence of a cycling path, low access to green space and low destination density, the likelihood to perform walking and cycling was increased in clusters with a presence of cycling paths, a high accessibility of green space and a high destination density. Comparing these two built environment clusters, with no walking and cycling as reference, the OR (95% CI) to perform walking and cycling but lower than the median duration was 1.53 (0.88–2.66) and the OR to perform walking and cycling over the median duration was 2.55 (1.41–4.64).

Conclusions: These results suggest that combinations of built environment characteristics may facilitate walking and cycling during leisure time in French adults. These data may be useful to inform policy and decision makers about neighborhood characteristics associated with an active lifestyle.

Keywords: Cycling, walking, built environment, cluster analysis, accessibility, adults.

ACKNOWLEDGMENT

This work is part of the ELIANE (environmental links to physical activity, nutrition and health) project supported by the French National Research Agency (Agence Nationale de la Recherche, ANR-07-PNRA-004). Part of the data collection was also funded by Compalimage project (ANR-05-PNRA 010).

BUILTE19

PROMOTING PHYSICAL ACTIVITY THROUGH NEIGHBOURHOOD GREEN SPACE

Christopher Ellis, Naomi Gidlow, Rachel Davey, Tom Cochrane, Graham Smith, Jon Fairburn

Centre for Sport Health and Exercise, Staffordshire University, Staffordshire, United Kingdom

Background: Inconsistent evidence linking physical activity with green space has often focused on access to, rather than use of, green space. In the UK, related research typically involves larger, better equipped parks, yet there may be greater public health potential in promoting smaller neighbourhood parks that are accessible to many communities.

Objective: I. To combine rigorous evaluation with effective community working to promote and measure use of a small neighbourhood park in a deprived urban community (UK). II. To pilot a multi-faceted evaluative approach to measure effectiveness of interventions.

Methods: A four part pre-post evaluation aimed at identifying the effects of an 11 month intervention: I. focus groups with local adults and young people explored perceptions of the green space and identify appropriate interventions; II. a postal survey to all households (n = 1,075) within 300 m of the park (green space use and perceptions, physical activity and health); III. direct observation of green space use with protocols adapted (and piloted) from SOPARC (recording demographic groups, use, estimated activity intensity); IV. green space audit using a tool developed (and piloted) from existing measures. Follow up data collection will be completed in July 2010 and findings presented.

Results: Data from focus groups with adults (n = 35; 48.0 ±15.7 year) and young people (n = 23; 12.7 ±0.8 year), postal surveys (n = 89; 46.2 ±17.6 year) and park observations (3 days) revealed consistent themes at baseline. Overall impressions of the park were poor/very poor in 56% of survey respondents. A lack of activities/facilities for children and young people was perceived by most focus group participants. Many adults reported avoiding the park because of a lack of play facilities for parents/young children or fears of anti-social behaviour by local youth (esp. weekend evenings); this was largely attributed to young people's boredom through the lack of activities. Direct observations showed that few people used the park for active recreation. On week days and weekend days respectively: 74% and 57% of users were simply walking through the park; 12% and 22% were dog walkers; just 3% to 6% visited for play or recreational activities. Accordingly, activity intensity in 86% of users was classified as walking, with less than 5% of users estimated to be in moderate-vigorous intensity activities.

Conclusions: Negative perceptions and poor facilities meant the park did not serve the community as a site for recreational activity. Intervention activities for children/families/youth and site modifications were implemented, informed by baseline data. Findings from follow up data will be reported.

Keywords: Green space, parks, physical activity, environment.

ACKNOWLEDGMENT

The project was funded by Natural England and Marks & Spencer. The authors would also like to acknowledge Groundwork, Stoke-on-Trent City Council (South Western AIT), Clarice Cliff Primary School, Edensor High School, the Community Police Officers, and all participants.

BUILTE23

IS A WALKABLE NEIGHBORHOOD FOR ADULTS AS WALKABLE FOR ADOLESCENTS?

Ilse De Bourdeaudhuij[1], Femke De Meester[1], Delfien Van Dyck[1, 2], Benedicte Deforche[1, 3], Greet Cardon[1]

[1] Department of Movement and Sport Sciences, Ghent University, Ghent, Belgium
[2] Fund for Scientific Research Flanders (FWO), Belgium
[3] Department of Human Biometry & Biomechanics, Vrije Universiteit Brussel, Brussels, Belgium

Background: In adult research, highlywalkable neighborhoods are defined by high street connectivity, residential density and land use mix. A growing body of evidence is documenting the positive relationship between neighborhood walkability and physical activity. However, it is not clear whether these associations also exist in adolescents.

Objective: The main purpose of this study is to investigate whether neighborhood walkability as defined using the adult criteria is to the same extent related to levels of physical activity in the adolescent as well as the adult population.

Methods: Adults and adolescents living in the same neighborhoods were compared. In Ghent (Belgium), 24 neighborhoods were selected based on walkability and SES. The walkability index was determined using objective GIS – based measures and neighborhoods were matched on neighborhood SES (median income).

From those 24 neighborhoods, 478 adolescents (aged 13 to 15) and 1,166 adults (aged 20 to 65) participated in the study. Physical activity levels were assessed using accelerometers (7 days) and self reports. Multivariate regression analyses were conducted using MLwin to analyze the moderating effect of age (adolescent–adult) on the association of neighborhood walkability and SES with physical activity.

Results: The multi-level models revealed that the association of neighborhood walkability with self-reported min./week active transport was moderated by age ($p < 0.001$). Adults living in highwalkable neighborhoods reported 117 min./week ($p < 0.001$) more active transport than adults living in low walkable neighborhoods. In adolescents, the self reported min./week of active transport did not significantly differ according to neighborhood walkability. Age did not moderate the association of neighborhood walkability with accelerometer – based MVPA and self reported min./week sport during leisure time and total PA. Living in highwalkable neighborhoods was associated with more accelerometer – based MVPA ($p < 0.001$) and with more self reported min./week total PA ($p < 0.05$) for adults as well as for adolescents. For the self-reported number of min./week of sport during leisure time, no association was found with neighborhood walkability for the total sample.

Conclusions: A high walkable neighborhood as defined using adult criteria is a trigger for more active transport in adults, but not in adolescents living in the same neighborhoods. These findings indicate that a walkable neighborhood may be based on different characteristics for adults or adolescents.

Keywords: Environment, walkability, active transport, ecological model.

ACKNOWLEDGMENT

This study was supported by a research grant from the Ghent University, and from the Fund for Scientific Research Flanders (FWO), Belgium.

Section
Built environment and physical activity for transport

Poster presentations

BUILTE01

TRAVEL BEHAVIOUR CONCERNING WORK AND STUDYING TRIPS AMONG SLOVENE URBAN RESIDENTS

Janet Klara Djomba, Zlatko Fras, Lijana Zaletel-Kragelj

Faculty of Medicine, University of Ljubljana, Ljubljana, Slovenia

Background: Active transport increases levels of physical activity (PA) and is more likely to be adopted and sustained than exercise programmes. Cycling and walking as means of transport offer significant positive health gains therefore promoting healthy and sustainable transport alternatives can prevent negative effects of transport patterns on human health.

Objective: With the following study we aim to determine workplace and studying related transport behaviour among urban residents with the focus on active transport. The results will be useful as evidence in planning activities for the promotion of active transport.

Methods: The data originate from the national health behaviour database in adults aged 25–74. Data collected in 2008 were used. The sample size was 15,963 the overall response rate was 49% and 7,352 questionnaires were eligible for analysis. Among them there were 1,440 urban residents who were employed or students. The observed behaviour was the use of active transportation (walking, cycling) and the dependence of workplace or study place distance. A chi-square test was used for analysis.

Results: Results show that 58.8% of urban residents travel to their work/study place by motor vehicles, 18.8% is walking, 8.8% is cycling and 11.0% use public transport. The use of active transportation is highly dependent on workplace distance ($p < 0.0005$). For distances up to 0.5 km, 73.1% of the observed is walking, 3.8% is cycling, 1.9% use public transport and 19.9% drive by motor vehicle. For distances from 0.5 up to 2 km, 37.2% of the observed is walking, 16.6% is cycling, 5.1% use public transport and 40.8% drive by motor vehicle. For distances from 2 up to 10 km, 6.4% of the observed is walking, 12.8% is cycling, 15.6% use public transport and 65.3% drive by motor vehicle. For distances from 10 km: 1.4% of the observed use active transportation, 13.6% use public transport and 85% drive a motor vehicle.

Conclusions: The overall results are not surprising, similar results were found outside Slovenia, too. What is alarming is the very high percentage of non-active transportation at short distances, therefore more public health intervention is needed to promote active travelling as a physical activity.

Keywords: Active transport, cycling, walking, physical activity, health promotion, Slovenia.

BUILTE02

TOTAL AND TRANSPORT-RELATED PHYSICAL ACTIVITY AMONG RURAL AND URBAN ADULTS IN GERMANY

Birgit Wallmann, Sybille Schneider, Ingo Froboese

Centre of Health, German Sports University Cologne, Köln, Germany

Background: Concerning physical activity levels in different demographic surroundings, no internationally comparable data exist for Germany. Urban, suburban and rural settings offer different opportunities for subcomponents of physical activity, especially when considering age groups. Understanding the influence of the population figure can be an effective factor for promoting physical activity.

Objective: The objective of this study was to examine the influence of the population size on all subcomponents of physical activity such as transportation or recreational activities in different age groups in Germany.

Methods: Through a representative telephone based survey across Germany, a total of 2,509 inhabitants (1,092 male; 49.0 ±16.7 years; 25.2 ±4.7 kg/m^2) were asked concerning their self reported physical activity and demographic parameters. The sample was subdivided by population figure [< 5,000 (n = 311); 5,000–20,000 (n = 554); 20,000–100,000 (n = 622); 100,000–500,000 (n = 407) and > 500,000 inhabitants (n = 615)] and age [18–29 years (n = 383); 30–45 years (n = 687); 46–65 years (n = 958) and > 65 years (n = 481)]. The Global Physical Activity Questionnaire (GPAQ) was used to ask for moderate and intensive physical activity during work, transport and recreation.

Results: Of the total population, 58.1% achieve the physical activity recommendations (> 600 MET-minutes/week) with a mean of 1,209 ±1,260 MET-minutes/week. In overall physical activity there is no difference between an urban or rural setting. People living in a rural setting have the least transport-related activity compared to people living in cities greater than 100,000 inhabitants ($p < 0.05$), but have higher job related physical activity. For age related subgroups, people in rural areas between 18–29 years of age are more active overall than in towns of between 100.000–500.000 inhabitants ($p < 0.05$). Inhabitants aged 46–65 years have significantly higher transport related activity in cities greater than 500,000 inhabitants than their counterparts in towns smaller than 100,000 inhabitants.

Conclusions: Total physical activity does not differentiate between a rural or an urban setting, although there is a shift of higher work and lower transport related physical activity in rural compared to suburban and urban areas, which will be of future interest.

Keywords: Physical activity, transport, GPAQ, MET minutes, population size.

ACKNOWLEDGMENT

We thank ERGO AG for financing the survey.

BUILTE03

POSSIBILITIES OF THE APPLICATION OF WALKING TO VISUALLY HANDICAPPED PEOPLE

Ladislav Bláha, David Cihlář, Štefan Balkó, Martina Bartůňková, Lucie Kloudová, Ludmila Drahovzalová, Alena Ženíšková

University of J. E. Purkyně, Ústí nad Labem, Czech Republic

Background: Walking helps to ensure interaction with one's surroundings. The problem in the relationship between a visually handicapped person and their surroundings lies in orientation and movement control. The person needs to create an image of space and actions. Confident movement and well controlled walking can mean broadening their images of space.

Objective: The objective of this study was to contribute to the specification of chosen indicators of the applicability of walking to visually handicapped people. At the same time, we wanted to warn of the problems which are related to this locomotion.

Methods: The study is based on research methods used with the ordinary population. We present the data from the observation of the occurrence of ordinary locomotion during a week long application of pedometers Yamax Digi-walker SW-700 in visually handicapped people. Chosen data were acquired via the short and long version of the IPAQ questionnaires. The specifics of each handicap were addressed by standardized questionnaires and interviews. The research took place between 2007 and 2009. With respect to the type of handicap, it was often necessary to choose an individual approach towards the examined people.

Results: We tried to connect the chosen results with the work opportunities of the visually handicapped people in the northern part of Bohemia, and to compare them with the results acquired in the samples of active seniors. It is obvious that visually handicapped men and women rank in the lower bounds of the recommendations for daily volume of steps when compared to the healthy people (Tudor-Locke & Basset, 2004). In average values, men are better than women in their walking activities during their working days (M = 5,627 steps, W = 4,877 steps) and also at the weekends (M = 4,969 steps, W = 3,940 steps) days. At the same time, a positive influence of employment on the volume of walking activities appears (r = 0.4). In taking an average daily number of steps, the active seniors are significantly better than visually handicapped people (M = 10,162, W = 8,491 steps during their working days and M = 9,659, W = 8,015 steps during the weekend days).

Conclusions: Walking is not exercised in a desirable way by visually handicapped people. Walking by handicapped people has its bounds. At the same time, it belongs among the safe activities which should be developed by this part of the population.

Keywords: Visual impairment, walking, IPAQ, pedometer, physical activity.

ACKNOWLEDGMENT

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BUILTE05

PERCEIVED AND OBJECTIVE PROXIMITY OF LOCAL DESTINATIONS AND THE RELATIVE IMPORTANCE FOR WALKING

Christopher Gidlow, Graham Smith, Charlie Foster[1]

Centre for Sport Health and Execise, Staffordshire University, Staffordshire, United Kingdom
[1] Oxford University, Oxford, United Kingdom

Background: Land use diversity, typically measured in terms of the proximity of walking destinations (e.g. shops, services), is widely considered important for walkability. As many measures of walking/physical activity capture usual or recent activity, the relative importance of actual or perceived proximity for walking to these destinations is unclear.

Objective: To explore: I. associations between the objective and perceived proximity of different types of walking destination; II. how perceived and objective proximity relate to whether people do/do not walk to each destination type.

Methods: A representative sample of adults from Stoke on Trent, UK, estimated walking times "to the nearest" of 8 types of destination. Five category responses were dichotomised into perceived proximity for each type of destination as ≤ vs. > 5 minutes and ≤ vs. > 10 minutes. Using Geographical Information Systems (GIS), an equivalent network was used to estimate objective proximity as ≤ vs. > 5 and 10 minute walking distance (based on a 4.5 km/hour average walking speed). Participants identified on maps all destinations that they walked to from home. Annotated maps were scanned into GIS, recalled destinations digitised and network distance from the home was calculated.

Results: Complete data were available for 63 participants (33 men, 30 women aged 43.0 ±11.0 year). When looking at the location of destinations within a 5 or 10 minute walking distance, Kappa statistics showed poor to fair agreement between perceived and objective proximity that reached significance for some destinations within a 5 minute (fast food outlets and bus stops; $\kappa = .18$ and $\kappa = .29$) and 10 minute walking distance (local services, non-fast food eating/drinking, and physical activity facilities; $\kappa = .165$ to $.288$). In relation to whether participants walked to those destinations, the objective (not perceived) proximity within a 5 minute walking distance was associated with walking to local services ($\kappa = .37$) and non fast food eating/drinking establishments ($\kappa = .21$). For a 10 minute walking distance, perceived proximity was significantly associated with walking to local services only ($\kappa = .26$, $p = .017$). Overall, mean network distance to destinations was 24% (±42%) higher in people who did not walk to them (compared with those who did), reaching significance for local services (221 ±126 vs. 432 ±223 m, $p < .001$).

Conclusions: Data from this small sample showed some agreement between the objective and perceived proximity of walking destinations. Objective distance to most destination types was lower in those who walked to them, but associations between proximity and walking to destinations varied.

Keywords: Physical activity, neighbourhood, environment, walking.

ACKNOWLEDGMENT

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BUILTE07

ACTIVE TRANSPORT TO SCHOOL IN CZECH HIGH SCHOOL STUDENTS

František Chmelík, Karel Frömel, Petra Nováková-Lokvencová, Emil Řepka[1]

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic
[1] Faculty of Education, South Bohemian University, České Budějovice, Czech Republic

Background: Active transport is considered to be an important source of moderate physical activity (PA) in youth. Detailed information about the PA related to active transport (AT) and its contribution to total daily PA is lacking. Objective data on transportation PA in Czech youth has not been measured.

Objective: The main aim of the study is to estimate the proportion of PA performed as a part of transport to school to the total daily PA and to assess the importance of AT in relation to PA recommendations.

Methods: Students of 3 high schools (157 females and 63 males; response rate = 67.9%; age = 16.9 ±1.0; BMI = 21.2 ±2.6) wore a pedometer (Yamax Digi-Walker SW700) for 7 consecutive days. They entered information about their number of steps, physical activity, and inactivity into record sheets. The structure of the record sheet enables the analysis of PA in different parts of a day. Mann-Whitney U test was performed to assess statistical significance of the differences in PA.

Results: On an average school day, the students performed 10,975 ±2,601 steps. In the before school period they did on average of 1,752 ±677 steps. AT to school accounts for 16.6% of an average school days' PA. Female students who did more than 1,500 steps on their way to school had significantly higher daily number of steps ($Z = 2.61$, $p = 0.01$, $d = 0.50$) than those who did not reach the 1,500 steps before school. In male students this difference was not significant. AT to school contributes to the amount of total daily PA more in students who do not accumulate 12,000 daily steps.

Conclusions: AT to school is an important source of PA in Czech high school students. Walking to school should be promoted.

Keywords: Physical activity, steps, pedometer, walking to school, before school physical activity.

ACKNOWLEDGMENT

The study has been supported by the research grant from the Ministry of Education, Youth and Sports of the Czech Republic (No. MSM 6198959221) "Physical Activity and Inactivity of the Inhabitants of the Czech Republic in the Context of Behavioral Changes" and by the research grant (FTK_2010_021) "School of healthy and physically active lifestyle of 15–16 years old students".

BUILTE08

WALKING AND REFERRED CORRELATES IN CZECH ADOLESCENT GIRLS

Filip Neuls

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: Walking is a substantial part of daily physical activity. Physical activity level has been frequently reported to be decreased in adolescent girls; hence the importance of walking as one of the most frequent forms of active transport increases in this subpopulation.

Objective: The main objective of this study was to assess walking as a part of daily physical activity in Czech adolescent girls and to analyze possible correlates of walking within this age group, also with respect to selected physical activity recommendations.

Methods: A sample consisted of n = 1,865 15 to 18 year old girls from all main regions of the Czech Republic (quote and randomized sampling). To assess their daily amount of walking, the short self administered version of the International Physical Activity Questionnaire was used. The applied Czech edition is supplemented by demographic and additional questions. Non parametric variables (median, quartile range), Kruskal-Wallis ANOVA, Mann-Whitney U-test (as a post-hoc test) and logistic regression analysis were used for statistical procedures using Statistica 6.0 software.

Results: In accordance with expectations, walking is the most considerable component of physical activity in adolescent girls. Its proportion of total physical activity (including vigorous and moderate physical activity) is approximately 60%. The daily duration of walking is about 60 to 80 minutes. Environmental factors (particularly the type of housing or the number of inhabitants in a location area) and smoking can be considered as possible correlates of walking in Czech adolescent girls, while other evaluated factors like age, BMI, organized physical activity, ownership of a dog or a bicycle do not seem to be associated.

Conclusions: Everyday activities like walking for transport/recreation are essential for the physical activity level in adolescent girls. A high amount of walking activity typical for our home settings is considered as very positive and should be supported by caring for a "walkable environment".

Keywords: Physical activity, active transport, youth, IPAQ.

ACKNOWLEDGMENT

The study has been supported by the research grant from the Ministry of Education, Youth and Sports of the Czech Republic (No. MSM 6198959221) "Physical Activity and Inactivity of the Inhabitants of the Czech Republic in the Context of Behavioral Changes".

BUILTE09

CYCLOTOURISM IN THE CZECH REPUBLIC

Eva Schwartzhoffová

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: The bicycle is a piece of sporting equipment and means of transport, but also a fashion accessory and an integral part of one's lifestyle. This project deals with cyclotourism as a form of transport and travel. Cycling is also a form of tourism, and a favorite pastime for all age groups.

Objective: This work describes the conditions and potentials of cylotourism in individual regions of the Czech Republic, aiming to evaluate the importance of cyclotourism in the field of tourism while presenting a typology of bike routes and providing specific examples.

Methods: In preparing this contribution, the following research methods have been used – analysis, synthesis, comparison, and study of monographs. The results are derived primarily from secondary sources, but primary sources such as current legislation and strategic plans related to cycling in the Czech Republic have also been examined. The work also draws on the authors' theoretical research and the practical experiences of the author.

Results: Cyclotourism, or rather touristic-recreational cycling, is, along with transport and sports cycling, one of the three basic types of bicycle use. Similarly, it is possible to identify several groups of bikers, where – in addition to children, seniors, adults, and sports cyclists – cyclotourists and recreational bikers are another target segment of users. Bike routes are essential to the development of cyclotourism. We distinguish between bike trails, cyclotouristic routes, and bike paths. In addition to these, contemporary cyclotouristic infrastructure includes: single tracks, the Europe wide cycle route network EuroVelo, long distance bike paths with an international character, bike paths in border regions and Greenways trails. Another interesting phenomenon is represented by so-called thematic trails. These include, for example, Moravian wine trails, beer cycling paths, rail trails and educational bike trails. Cyclists would welcome a national certification system for bike paths.

Conclusions: Cyclotourism has great potential for further development and is an option for the sustainable development of the tourism industry. But for this, what is essential is the development of a suitable offering of tourist options catered to cyclotourism.

Keywords: Cycling, cyclotourism, lifestyle, region, tourism.

BUILTE10

BEHAVIOR-SPECIFIC BUILT ENVIRONMENTAL DETERMINANTS OF WALKING AND CYCLING AMONG DUTCH CHILDREN: RESULTS FROM THE SPACE STUDY

Sanne De Vries, Marijke Hopman-Rock, Ingrid Bakker, Remy Hirasing, Willem van Mechelen

TNO Quality of Life, Leiden, the Netherlands

Background: Social-ecological models are increasingly being used to gain an insight into the role of the built environment in walking and cycling. Studies using these models suggest that built environmental correlates of walking and cycling may not only be "country or continent specific", but also "purpose specific".

Objective: This study aimed to identify built environmental correlates of – walking and cycling for transportation, walking and cycling to school, and walking and cycling for recreation among a sample of Dutch children.

Methods: The population involved 448 6 to 11 year old children from ten neighborhoods in six Dutch cities. Walking and cycling were assessed by a 7 day physical activity diary. Built environmental characteristics were collected by neighborhood observation. Multivariate linear regression analyses were conducted to identify environmental correlates of children's walking and cycling behavior and to examine whether there are differences by purpose (transportation and recreation) and commuting mode (walking and cycling). Analyses were adjusted for age, sex, parental education level, and ethnicity. Although the clustering of subjects within neighborhoods was limited, multilevel analyses were also conducted.

Results: On average, the children made 13.3 walking and 6.6 cycling trips per week for transportation; 3.6 walking and 1.5 cycling trips per week to school; and 0.7 walking trips per week for recreation. Although small differences were found between built environmental correlates of walking and those of cycling, both commuting modes were positively associated with the frequency of pedestrian crossings and the frequency of parallel parking spaces in the neighborhood. More differences were found in the correlates of walking and cycling for different purposes. Whereas none of the characteristics under study were significantly associated with walking for recreation, a considerable proportion of the variance in walking and cycling for transportation and walking and cycling to school could be explained by built environmental characteristics. Adjusted multivariate models showed that about 30% of the variance in walking and cycling for transportation could be explained by the number of recreation facilities in the neighborhood and the walking and cycling infrastructure of the neighborhood. Comparable correlates were found for walking and cycling to school.

Conclusions: Built environmental correlates of children's walking and cycling behavior differ by purpose and by commuting mode implying a behavior-specific approach for interventions and for future, preferably prospective, studies.

Keywords: Physical activity, active transport, built environment, children, multilevel analyses.

ACKNOWLEDGMENT

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BUILTE11

PHYSICAL ACTIVITY BEHAVIOR OF URBAN CHILDREN USING GPS AND GIS; RESULTS FROM THE SPACE STUDY

Sanne De Vries, Jamie Graham, Reinier Sterkenburg, Jantine Slinger, Frank Pierik

TNO Quality of Life, Leiden, the Netherlands

Background: The urban built environment influences the physical activity levels of children. Currently, knowledge of which environmental factors affect activity behaviour among children, and how they do so, is not clearly understood. Traditional analysis methods provide only limited insight, since they are unable to accurately determine exactly where children are active.

Objective: The purpose of our study was to gain a better insight into the urban locations where children are physically active by using both Global Positioning System (GPS), ActiGraph accelerometers and Geographic Information Systems (GIS) technologies.

Methods: Approximately 90 school children (aged 7–11 years) from 5 cities in the Netherlands participated in the study for a maximum of 7 days. The locations and intensity of their activities were recorded by GPS and accelerometer, and by a 7 day physical activity diary. A spatial analysis of the children's activities was conducted by use of GPS track data together with geographical information concerning aspects of the physical environment (e.g. land type, land use, buildings, and playgrounds).

Results: Preliminary results indicate that the children spent a mean of 1.8 hours per 24 hour period outdoors, and that 26.7% of this time was spent in areas containing natural vegetation. Despite that the amount of time spent near public playgrounds and the school playground was relatively low (mean 4.6 minutes, range 0–13 minutes per 24 hours), the mean activity levels during these periods were higher than in any of the other investigated areas. Information on activity levels and actual distances walked by children for various purposes (e.g. travelling to school) will be presented.

Conclusions: These findings provide better insight into the question where children spend their time and where they are physically active. Using GPS, in conjunction with GIS, appears to be an insightful and promising addition to this field of research.

Keywords: Physical activity, children, built environment, accelerometer, GPS, GIS.

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BUILTE13

ACCESSIBILITY TO PHYSICAL ACTIVITY PROGRAMMES FOR ELDERLY PEOPLE

Ana Isabel Marques[1], Luísa Soares-Miranda[1], Carla Moreira[1], António Oliveira-Tavares[1], Paula Clara-Santos[1], Susana Vale[1], Rute Santos[1, 2]

[1] Ciafel, Gafanha da Nazaré, Portugal
[2] Ciafel, Ismai, Gafanha da Nazaré, Portugal

Background: There has been a growing concern in designing physical activity (PA) programmes for elderly people, since evidence indicates that such health promotion interventions may reduce the deleterious effects of the ageing process. For older adults, access to local facilities plays a major role for being active.

Objective: The aims of this study were: 1. to examine whether there is a good accessibility to PA programmes for elderly people developed by the Portuguese local public administration; 2. to analyse what kinds of access exist to get to those programmes.

Methods: Data were collected by an on-line questionnaire sent to 26 coordinators of PA programmes. Descriptive statistics were used in order to characterize accessibility.

Results: Good access to facilities was provided in most of the programmes (96.15%). Regarding the type of access to facilities, 69.2% of the programmes had wide sidewalks and 65.4% had a good public transport network. Only 11.5% of the programmes had cycle paths and the same percentage its own transportation resource.

Conclusions: Most programmes had good access to facilities; however, the range of variety in terms of accessibility is limited.

Keywords: Physical activity programmes, older adults, accessibility.

ACKNOWLEDGMENT

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BUILTE14

PHYSICAL ACTIVITY (SPORT) RELATED VALUE ASPIRATIONS OF PEOPLE IN SELECTED REGIONS OF THE CZECH REPUBLIC

Tomáš Dohnal, Vladimír Hobza

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: Physical activities play an irreplaceable role in our human lifestyle. The article talks about physical activities and (sport) related preferences of various population groups in the Czech Republic. The research was carried out in a sample of regions and it aimed to examine the importance of physical activities in peoples' life style generally but also in the life style of a particular respondent. The article also analyses people's attitudes towards economic, political and administrative solutions carried out by municipalities or regional authorities.

Objective: The aim of the article is to analyze the value orientation of people living in five selected regions of the Czech Republic in relation to their life style, physical activity (sport) and, consequently, their requirements (expectations) related to solutions offered in this field by public administration (i.e. communities and regional governments).

Methods: The following methods were used to elaborate this article: analysis, synthesis, comparison. We used data obtained during various research carried out in a sample of regions between 2006 and 2009. To obtain the data, a method of questioning (a public survey technique) was used.

Results: Considering negative tendencies in the development of the Czech populations' health (all age groups are concerned), physical activities are seen as being an important part of our human lifestyle. Our results show a positive attitude which people of all age groups have towards physical activities. We demonstrated also the relationship between the frequency of physical activity done during a specific period of time and the quantity and the quality of the facilities for physical activities. We consider interesting also the fact that a large majority of respondents prefer financial support of a physical activity for the non-registered population.

Conclusions: It is important to analyze the attitudes of all age groups towards physical activities to be able to find consequently a system and a conceptual solution of this question a physical activity is for us an instrument to develop the personality of anyone.

Keywords: Life style, health, physical activity, conditions.

BUILTE15

SCHOOL YARDS, PHYSICAL ACTIVITY AND GENDER RELATIONS

Rosa Diketmueller, Heide Studer

University of Vienna, Vienna, Austria

Background: Health data concerning the fitness status of children in Austria as well as studies on PA levels in schools and during recess have shown, that girls are less active. Not much is known about how school environments, especially outdoor areas and school yards, influence boys' and girls' behavior and PA levels.

Objective: The questions were: how do girls and boys act and behave in schoolyards during recess and how do environmental aspects, equipment and facilities influence their engagement in PA in schoolyards?

Methods: The data was collected through participatory observations and video recordings during 60 recess periods in 20 schools. In addition, interviews with heads of schools, teachers and pupils as well as document analysis of the school regulations (20) were conducted to analyse the utilisation of the school yards.

Results: The data collected by observations and video recordings were condensed and transferred into "maps of utilization" to point out gender issues in usage and PA in schoolyards as well as places and facilities, which boys and girls prefer/ignore. Together with the results of interviews and group discussion, different factors were identified (facilities, equipment, regulations, attitudes, etc), which seemed to inspire girls and boys in different ways to engage in PA during recess. To change the situation and to promote the engagement, esp. of girls and other inactive groups, it seems to be helpful to focus on environmental and spatial aspects as well as on pedagogical and organizational issues.

Conclusions: The integration of the results into teacher education showed that utilization maps and environmental aspects were particularly useful in the process of sensitizing teachers to what was happening in schoolyards and for the planning the design and organization of schoolyards.

Keywords: School environments, gender, PA.

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BUILTE16

(THE TITLE OF THIS ABSTRACT HAS NOT BEEN PROVIDED BY THE AUTHOR)

Stefania Pascut

Municipality of Udine, Udine, Italy

Background: The city of Udine has strongly committed itself to create an age friendly urban environment, by strengthening collaboration between the Urban Planning Department and the Healthy City Project and by re-designing the city to make infrastructure, buildings, roads, green spaces, etc. more accessible.

Objective: The project aims to develop a model of analysis and applicability which could then be repeated in other municipalities.

Methods: Another important planning initiative called "Safety measures in school areas in three municipalities of the region" has been undertaken in the years 2008–2010. Three municipalities were chosen in the region to carry out this project at the local level according to size and past commitment to healthy urban planning and sustainable mobility.

Results: It consisted of a detailed analysis of problems detected in the areas close to schools, such as risk and impediment factors, structural deficiencies, dangerous crossings, the "broken effect" in streets, etc. These problems were analysed from a technical point of view by professional staff and from a social point of view, taking note of peoples' everyday experiences on the road and of the needs perceived by both children going to school and parents or relatives accompanying them (through questionnaires).

Conclusions: Based on this feasibility study, three proposals for interventions and safety measures were chosen and carried out (roads, crossings, cycle tracks, parking places, etc.).

Keywords: Road safety, children, school routes, sustainable mobility, safe environments.

BUILTE17

PROCESS EVALUATION OF "FREE YOUR FEET": A ONE WEEK CAMPAIGN TO PROMOTE WALKING TO SCHOOL IN SECONDARY SCHOOL STUDENTS IN ENGLAND

Emma Adams

School of Sport, Exercise and Health Sciences, Loughborough University, Loughborough, United Kingdom

Background: Only 40% of 11–16 year olds in England walk to school. To date there have been few initiatives promoting walking to school in secondary school students. Living streets' "Free your feet" initiative aims to address this gap by delivering a one week walk to school campaign in secondary schools.

Objective: This evaluation aimed to assess the experiences of schools and School Travel Advisers in delivering the "Free your feet" initiative and to make recommendations for improvements to facilitate delivery and increase participation.

Methods: "Free your feet" was delivered in May 2010. Post only surveys were sent to the main school contact in all participating schools (n = 50) and all School Travel Advisers (STAs) involved in delivering the initiative (n = 28). The survey was available for completion online and as a paper version and asked about school characteristics; perceptions of the walking environment around schools; travel to school policy; roles and responsibilities; recruitment of schools to the initiative; and delivery of the initiative including timing, communication, engagement of schools, teachers, parents and students, perceptions of the resources and activities, challenges, successes and future participation.

Results: The survey was completed by 25 schools and 20 STAs. No specific criteria were used to recruit schools for the initiative. Some participating schools had high levels of students walking to school already (48%) or students lived too far from school to walk (56%). STAs were important in supporting delivery of the initiative at the local level. Respondents had mixed views about the timing of the initiative due to capacity and older students being on study leave during exams. Permission to take part was obtained from Head Teachers, however, engaging other teachers was challenging. Parents were not directly notified about the initiative in some schools (36%); publicity materials were requested to help engage parents and encourage them to support walking to school. The resources were thought to be of good quality, contained relevant content and were easy to use but may need to be tailored for older age groups. Student participation in the initiative varied across schools however, most schools indicated they would participate again.

Conclusions: "Free your feet" is an important initiative for promoting walking to school in secondary schools. Criteria should be developed to recruit suitable schools and changes made to delivery processes to maximise participation and the potential for increasing walking to school.

Keywords: Walk to school, secondary schools, walking campaign, process evaluation.

BUILTE18

ADOLESCENTS' FORMAL PHYSICAL ACTIVITY AND PARENTS' SCHOOLING LEVEL

M. M. Pereira, A. N. Pizarro, Jorge Mota, H. Nogueira, M. P. Santos

CIAFEL, Porto, Portugal

Background: Adolescents' behaviors towards physical activity may determine adulthood Physical Activity Levels (PAL). It is important to identify which variables are more likely to influence adolescents PAL in order to promote healthier adults.

Objective: Our purpose was to see whether Parents' Schooling Level (PSL) was associated with adolescents' engagement in formal physical activity and we also wanted to verify if there was a coherent geographic distribution of both variables.

Methods: A questionnaire was answered by 166 adolescents (age 16.97 ±1.425) of Porto Schools. Data on the parish of residence, PSL, adolescents' habitual Practice of Formal Physical Activity (PFPA) and PAL was then collected. Both PSL and PFPA variables were categorical, so the Spearman correlation was calculated. Using ArcMap 9.3, PSL and PAL, variables means were mapped according to parishes of residence.

Results: PSL and PFPA are positively correlated (rho = 0.198; ń = 0.003). By mapping the PSL and PAL mean values by parishes it is possible to verify that there is the tendency of lower values to overlap. There is a relationship (although is not statistically significant) between social and individual variables and its distribution in the territory.

Conclusions: PSL is an important factor on adolescents' PFPA. More territorial (physical and social) factors should be included in this analysis in order to better understand this distribution trend.

Keywords: Physical activity, health, Geographic information systems.

BUILTE20

DEMOGRAPHIC, PSYCHOLOGICAL, SOCIAL AND ENVIRONMENTAL CORRELATES TO MEETING HEPA-RECOMMENDATION IN GERMAN YOUTH

Jens Bucksch, Darko Jekauc, Daniela Kahlert, Alexander Woll

Faculty of Health Sciences, University of Bielefeld, Bielefeld, Germany

Background: Regular participation in physical activity (PA) depends on different correlates. Social ecological models highlight that PA is influenced by variables of different ecological levels including the individual, the social and the physical environment. However, only a few studies simultaneously have examined intrapersonal, social, and environmental variables.

Objective: The objective of the current study was to investigate demographic, psychological, behavioural, social, and environmental factors associated with meeting Health Enhancing Physical Activity (HEPA) recommendation among German youth.

Methods: A cross-sectional design was used. The 164 boys and girls (50.6% boys, mean age = 12.9) were recruited from one comprehensive school in Konstanz (Germany). Respondents completed a self administered questionnaire assessing correlates, i.e. demographic (type of school, age, gender), psychological (PA enjoyment), behavioural (commuting to school, membership in a sports club), social (support from parents and peers), environment (time spent outdoors, built environment) of PA. PA was assessed by self report for the total sample and for 133 boys and girls by accelerometry. We separately computed a series of logistic regression analyses for self-reported and objectively measured HEPA recommendation, respectively.

Results: Univariate analyses showed that being a boy, more social support from peers and a higher frequency of time spent outdoors were significantly associated with the fulfillment of HEPA recommendation measured by self report. In general, we observed the same association with regard to the HEPA recommendation measured by accelerometry. In detail, the associations were stronger and we also observed that increasing age reduced and higher enjoyment, more social support from parents as well as agreeing that public PA facilities were within the neighborhood increased the odds of fulfilling the HEPA recommendation. In multivariate analyses only the frequency of time spent outdoors showed significant associations with HEPA recommendation. The Odds ratios (95% confidence interval) for self reported PA from the lowest to the highest tertile of the frequency of time spent outdoors were: 1 (referent); 0.9 (0.4–2.2); 3.2 (1.4–7.6). The corresponding Odds Ratios for PA measured by accelerometers were: 1 (referent); 1.2 (0.4–4.4), 3.2 (1.2–8.5).

Conclusions: A socio ecological approach to promote PA might be promising. Time spent outdoors was highlighted as an important environmental correlate in systematic reviews. More research is needed to understand the influences on time spent outdoors as a correlate of PA.

Keywords: Environment, HEPA, recommendation, social ecologic model, youth.

BUILTE21

SAFETY CYCLE TRAINING COURSE IN THE FRAMEWORK OF EUROPEAN PROJECT LIFE CYCLE

Mojca Janežič, Ajda Jelenc, Andrea Backovič Juričan

Institute of Public Health of the Republic of Slovenia, Ljubljana, Slovenia

Background: The National Institute of Public Health of the Republic of Slovenia (Chronic Diseases Prevention Centre CINDI) participates in the EU project "Life cycle". In Slovenia in the framework of the project a "Safety cycle training course" for adult population has been developed.

Objective: The aim of the "Safety cycle training course" is to offer the adult population an opportunity to renew and improve their knowledge related to cycling and thus increase the number of people who are physically active.

Methods: In Slovenia because of the differences in health related behaviour between urban and rural residents two geographically diverse samples have been chosen. Within the "Safety cycle training course" we have developed and implemented two different modules, one for general population and the other for educators. Furthermore in the framework of the module for educators we are also trying to include cycling in the programmes of healthy lifestyle workshops for adults with risk factors for cardiovascular diseases.

Results: We have developed and implemented two different modules – for the general population and for educators. The "Safety cycle training course" consists of the theoretical and practical part. In the theoretical part participants learn about the history of cycling, health aspects of cycling and renew their knowledge of road traffic regulations. In the practical part participants test their cycling skils on the obstacle course and in real traffic.

Conclusions: Our aim is to develop and implement a "Safety cycle training course" dedicated to specific target groups which will be unique in all of Slovenia and accessible to all adults in effect by the projects' end in May 2011.

Keywords: Life cycle, cycling, physical activity.

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BUILTE22

IMPACT OF AGE ON ACTIVE TRANSPORT HABITS IN URBAN RESIDENTS IN SLOVENIA

Janet Klara Djomba, Ajda Jelenc, Zlatko Fras, Lijana Zaletel-Kragelj

Faculty of Medicine, University of Ljubljana, Ljubljana, Slovenia

Background: Active transport e.g. walking or cycling offers an example, how to include physical activity (PA) into physically active lifestyle, especially in urban areas. The number of elderly participants in traffic increases therefore we need to assure that health promotion and transport planning activities are suitable for their special needs.

Objective: With present study, by which we examined whether the active transport habits depend on age, we wanted to contribute to quality health promotion planning for elderly age groups, more precisely promotion of PA as means of transport and transport planning.

Methods: The data originate from the national health behaviour database in adults aged 25–74. Data collected in 2008 were used. The sample size was 15.963, the overall response rate was 49%, and 7,352 questionnaires were eligible for analysis. Among them there were 1,440 urban residents who were employed/students. The observed behaviour was the use of active transportation (walking, cycling) and the dependence of age. Chi-square test was used for analysis.

Results: Our results show, that older age groups more often cycle or walk to work than younger people. Of the residents, 43.5% cycled to work/study place at least one day per week and 19.0% cycled every day, whereas 73.7% residents walked to their work/study place at least one day per week, and 52.7% walked every day. Choice of transport mode related to their work/study place was statistically significantly associated with age in cycling (11.9% respondents aged 25–29 cycled daily; the percentage increased up to 38.5% in those aged 55–59; $p = 0.023$) while in walking it was not (41.7% respondents aged 25–29 walked daily; the percentage increased up to 60.6% in those aged 55–59; $p = 0.075$).

Conclusions: The results could indicate that older adults are more aware of the importance of PA and that they will continue cycling and walking after retirement. Therefore we need to assure an infrastructure, which allows safe walking and cycling for the elderly.

Keywords: Active transport, walking, cycling, physical activity, older adults, Slovenia.

BUILTE24

AN INTEGRATED HEALTH RISK ASSESSMENT OF ACTIVE TRANSPORT: IMPACTS ON HEALTH AND CLIMATE CHANGE

Hana Brůhová-Foltýnová

Kolín Institute of Technology, Czech Republic

Background: Air pollution and physical inactivity belong among the main problems faced by our society. The promotion of cycling and walking could be an effective way to decrease both health and environmental problems. The TAPAS project aims at helping decision makers to design urban policies which promote good health and address climate change through encouraging active transport.

Objective: The aim of the paper is to introduce the reader to the international project "Transportation, Air Pollution, and Physical Activities: an integrated health risk assessment programme of climate change and urban policies (TAPAS)" and to compare characteristics of the case study areas analyzed under the project.

Methods: An integrated health risk assessment will be used in the TAPAS project. First, potential benefits and associated risks of analyzed policies will be identified. Second, a more specific computational model addressing travel behavior and selected health and environmental impacts will be built. Third, a list of transportation policy scenarios will be assessed. Since the project TAPAS is not yet finished, this paper presents a selection of results achieved so-far. In particular, I have studied state of the art main socio-economic and health indicators and effective urban policies to support cycling and walking in six case study areas (Barcelona, Paris, Copenhagen, Basel, Warsaw, and Prague) using urban audit data.

Results: Within six TAPAS case study areas, Prague and Warsaw show a smaller share of cycling, but a higher share of cars on a modal split. These two cities also demonstrate worse indicators of death rates in comparison with other TAPAS cities. On the contrary, the most "cycling oriented cities" in our sample are Copenhagen and Basel. These cities have been actively supporting cycling since the 1970's. No direct relationship between climate and geography indicators and the share of cycling on the modal split was clearly proven. It seems that the main factor of cycling support should be transportation policies. Taking this into account, the importance of a proper choice of policy scenarios under the TAPAS project increases. Our future research should show us the contributions of various policy tools towards the improvement in health and a decrease in greenhouse gasses. However, the implementation of policies supporting active transport must not necessarily bring the highest positives to the cities with the worst indicators (Prague or Warsaw), as could be expected.

Conclusions: No direct relationship between climate and geography and the share of cycling in a modal split was clearly proven. It seems that the main factor of cycling increase should be transportation policies. Therefore, the importance of a proper choice of policy scenarios under the TAPAS project increases.

Keywords: Walking, cycling, air pollution, physical activity.

ACKNOWLEDGMENT

The research was supported by the Coca-Cola Foundation supporting research project "TAPAS – Transportation, Air Pollution and Physical Activities; an integrated health risk assessment programme of climate change and urban policies".

Section
Physical activity preferences and existing physical activity intervention

Oral presentations

PREF05

NATIONAL STUDY OF PHYSICAL ACTIVITY LEVELS IN A SOCIALLY DEPRIVED POPULATION

Ruth F. Hunter, M. A. Tully, P. Donnelly, C. Cleland, M. Donnelly, M. E. Cupples, L. Prior, F. Kee

Centre for Public Health, Queen' s University Belfast, Northern Ireland, United Kingdom

Background: Despite clear evidence showing the benefits of physical activity (PA), only 31% of adults in Europe achieve the recommended guidelines (WHO, 2006). Physical inactivity is a common problem, particularly within socially deprived sectors of the population (NICE, 2006).

Objective: To investigate levels and domains of PA undertaken by those in socio-economically deprived areas in Northern Ireland and subsequently to design and promote community based initiatives which increase PA in such areas by utilising the community "knowledge" of stakeholders.

Methods: Using stratified random sampling, 1,130 interviews (of 4,000) have been completed of individuals aged 16+ living in Northern Ireland for over one year. The survey was conducted face to face using Computer Assisted Personal Interviewing (CAPI) relating to PA, sports participation and other health behaviours. The second phase of the study involved conducting semi-structured interviews with leading community representatives in a socio-economically deprived area in Northern Ireland regarding; (i) the nature and provision of PA initiatives, and (ii) identification and selection of focus group participants from "Physical Activity Need Groups" (PANGs). Interviews were audio recorded, transcribed verbatim and analysed using a thematic framework.

Results: Preliminary results from the survey indicate that 34% of the people in socio-economically deprived areas in Northern Ireland meet the current PA recommendations. The majority of this PA is acquired in the home (37%), with a further 30% at work, 20% at leisure and 13% through active travel. These findings are similar to those reported for the general population. Preliminary analysis of the interviews identified emerging themes relating to the design of successful initiatives. These include the perceived relationship between PA and health, financial and community support, access to facilities, programme content and current service provision. Perceived needs of particular groups for PA promotion related both to their individual health and social needs and the geographical area in which they live. The extent to which groups were perceived as being "hard to reach" influences the provision of services. The full data will be presented.

Conclusions: The survey results suggest that domains of PA may not be related to social deprivation. The implementation of PA in a socio-economically deprived area is a complex issue. Using intervention mapping, results will guide the design of specific PA initiatives.

Keywords: Physical activity, survey, domains of physical activity, socio-economically deprivation, semi-structured interviews, mixed methods.

ACKNOWLEDGMENT

We would like to acknowledge the National Prevention Research Initiative for funding this study.

PREF08

LOCAL NETWORKS FOR ACTIVE LIVING IN HEALTHY COMMUNITIES: A DUTCH-GERMAN CROSS-BORDER APPROACH AND ITS DIFFUSION INTO FOUR OTHER EUROPEAN COUNTRIES

Roland Naul, Caren Behnke, Dorothee Schmelt

Department of Sport Science and Human Movement Studies, University of Essen, Essen, Germany

Background: On the basis of a comprehensive literature review on "Young people's lifestyles and sedentariness" published in 2004 on behalf of the EU Sport unit, a multi sector network strategy at the community level was proposed to counteract the development of overweight and obesity and to promote an active lifestyle for all young people.

Objective: The Dutch-German project "gkgk" implements: active commuting to school, health enhanced PE at school, health and media education, PA between lessons and sports club based PA for selected groups of PE classes needing support for their physical fitness and motor development.

Methods: In total, an amount of 60–90 minutes of daily physical activity is provided. To achieve a more active lifestyle, the promotion of physical activity is supplemented by education and information campaigns about good eating habits and the benefits of physical activities for parents and teachers as well as for local officers.

Results: Local networks which link different settings and stakeholders have been established in all twelve communities of the project. A longitudinal evaluation study started with monitoring the first pupils' cohorts (grade 1–2; 3 communities, 6 schools, n = 259) and questionnaires for parents, children and network – partners in 2009 and 2010. The prevalence of being overweight and obesity in the first cohorts decreased after one year of a comprehensive intervention programs from 18.1% to 14.7% and their performance based on their motor abilities for boys and girls increased significantly in all measured items, except for "sit and reach". The follow up EU project started in 2010 ("Healthy children in sound communities"). Its purpose is to diffuse the strategy of the Dutch-German cross-border project to four other EU countries (CZ, PL, IT, UK) as well as to diffuse it into other provinces/states/cities, outside the cross-border region of the Netherlands and Germany (NL, DE).

Conclusions: Beside the establishment of a local network, gkgk links items of the four intervention programmes, conveys awareness of healthy nutrition and informs parents about their children's BMI status and the results of a physical fitness and motor development test.

Keywords: Health enhanced PE&PA, nutrition education.

ACKNOWLEDGMENT

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PREF15

INTERVENTION EFFECTS OF "3000 STEPS MORE A DAY" IN A COMMUNITY SETTING ON A PERCEIVED NEIGHBOURHOOD ENVIRONMENT

Birgit Wallmann, Petra Nentwich, Björn Grewe, Ingo Froboese

Centre of Health, German Sports University Cologne, Köln, Germany

Background: In recent years numerous studies have investigated the relationship between the level of physical activity and the perceived neighbourhood environment. However there is hardly evidence if the perceived neighbourhood environment or social well being in the community can be improved through physical activity. For communities a possible influence would be of great interest.

Objective: The aim of this study was to investigate the effects of the lifestyle intervention "3000 steps more a day" in a German village on villagers' physical activity level, on their perceived neighbourhood environment as well as on social well being in the community.

Methods: The intervention was implemented as a whole community intervention in a small German village of 1,237 inhabitants in North Rhine-Westphalia, which is based on the individual baseline activity level. To identify the baseline activity level, all participants wore a pedometer (Omron HJ-720-IT-E) with an invisible taped screen for seven days. On the foundation of the individual activity level the participants were urged to accumulate an additional 3,000 steps per day for the duration of 15 weeks. Pre and post-tests included questionnaires concerning well being in the community as well as physical activity related environmental factors in the form of the ALPHA questionnaire.

Results: Of the inhabitants, 112 (9% of the total residents; 38 male/74 female; mean age: 49.6 ±16.2 years) signed up for the intervention with a baseline activity level of 5,827 ±3,745 steps per day. The number of steps increased to 9,125 ±3,012/day during the intervention. Perceived environment aspects increased significantly during the intervention in relationship to the following themes: availability of bike lanes ($p < 0.01$) and infrastructure ($p < 0.01$) as well as maintenance of such infrastructure ($p < 0.001$). Perceived distance to local facilities reduced perceived environment aspects significantly ($p < 0.01$).

Conclusions: By means of the given results it can be shown that the perceived neighbourhood environment can be influenced through increasing physical activity. For communities this can be an additional argument for promoting physical activity.

Keywords: Lifestyle intervention, physical activity, perceived neighbourhood environmental, community.

PREF20

PHYSICAL ACTIVITY PREFERENCES AND BARRIERS AMONG INDUSTRIAL WORKERS FROM LOW AND HIGH INCOME CLASSES IN BRAZIL

Kelly Silva, Adair Lopes, Elusa Oliveira, Leandro Garcia, Giovâni Del Duca, Markus Nahas

Universidade Federal de Santa Catarina, Santa Catarina, Brazil

Background: Evidence suggests that leisure-time physical activity (LTPA) is associated with greater work capacity and overall health of workers, and it is strongly related to socioeconomic status. However, few studies have investigated the preferences and barriers for workers in LTPA.

Objective: To identify and compare the preferences and barriers for leisure time physical activity reported by industrial workers from low- and high-income classes in Brazil.

Methods: Cross sectional study involved analysis of data from a representative sample of industrial workers in 23 Brazilian States and the Federal District. Data collection occurred from 2006 to 2008, by means of a questionnaire involving 47,477 workers. We investigated only the two extremes of gross household income: workers with low income (≤ $280.00 = 32.1% of the total) and high income (> $1,340 = 9.0% of the total). As for LTPA, the level of practice, the preferred LTPA, companionship, where it is performed, and perceived barriers were investigated. Analysis included a Chi-square test with a significance level of $p \leq 0.05$.

Results: Prevalence of regular LTPA was 54.3% among low income workers, and 58.1% among high income workers. Low income workers were more involved with sports (50.2%) and walking (18.1%), and those with high income were more involved with walking (31.0%), sports (25.8%) and fitness/bodybuilding (20.0%). For those with a low income, 51.6% preferred group activity, and 28.1% did it alone, while for the ones with high income 37.8% did it in groups and 37.7% did it alone. Preferred sites for practice by those with low income were streets/parks (47.0%) and for high income people they were health clubs/gyms (40.4%). One fifth of the workers did not mention any barriers for LTPA. Low income workers mentioned an excess of obligations (25.7%), fatigue (20.4%), and lack of money (9.2%). For the high-income group, the most cited barriers were an excess of obligations (30.7%), fatigue (11.3%) and a lack of desire (11.3%). All analyses showed statistically significant differences among income groups ($p \leq 0.05$).

Conclusions: Low-income workers were more involved with sports activities; LTPA done in groups and using more public spaces, while those with high income preferred walking, either in groups or alone, and used more private spaces (health clubs/gyms).

Keywords: Leisure, physical activity, workers, income level, barriers to LTPA.

ACKNOWLEDGMENT

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Section
Physical activity preferences and existing physical activity intervention

Poster presentations

PREF01

COMBINED IMPACT OF HEALTH BEHAVIOURS ON FITNESS IN CHILDREN: A RANDOMIZED PROSPECTIVE STUDY

Ursina Meyer, Eliane Peterhans, Lukas Zahner, Pedro Marquez-Vidal, Susi Kriemler

Swiss Tropical and Public Health Institute, University of Basel, Basel, Switzerland

Background: There is clear evidence that behavioural factors influence fitness (and health) already in childhood, but an investigation of their impact on a general population of children is still needed.

Objective: We therefore aimed at quantifying the individual and combined impact of easily assessable health behaviours in randomly selected children on aerobic fitness four years later.

Methods: Selected Swiss children (502/540 6 to 13 years old) took part in a baseline health assessment and 294 (59%) of the performed an aerobic fitness test (shuttle run) four years later. At baseline, height and weight were measured and health behaviours assessed by questionnaire. Participants scored one point for each negative health behaviour: a BMI above the 85th percentile (IOTF), non participation in a sports club, less than 60 min of moderate-vigorous physical activity per day, less than 60 min outdoors per day, and media use of more than 60 min daily.

Results: After four years of follow up, the age, gender, and social class adjusted odds ratios (95% CI) for having a low fitness level (lowest tertile of age and gender adjusted z-scores) for children who had none or only one (n = 124) compared to two (n = 68), three (n = 31) or three and more (n = 34) risk behaviours were respectively 1.8 (0.9 to 3.4, p = ns), 4.5 (1.8 to 11.1, p = 0.001) and 5.1 (2.1 to 12.3, $p < 0.0001$).

Conclusions: Three negative health behaviours combined predicted a 4.5 fold higher risk of having a low level of aerobic fitness four years later, underlining the importance of early prevention.

Keywords: Physical activity, children, cardiovascular risk, fitness, health.

ACKNOWLEDGMENT

This study was funded by the Swiss Federal Office of Sports (grant number SWI05-013) and the Swiss National Science Foundation (grant number PMPDB-114401 and 324730_124976).

PREF02

WALKING SPEED AND LOWER LIMB STRENGTH IN ELDERLY

Jorge Mota, Elisa Alves Marques, Joana Carvalho

CIAFEL-FADEUP, Porto, Portugal

Background: Walking speed has been linked with low functionality levels.

Objective: To study the relationship between low walking speed and lower limb strength in older people attending a structured physical activity programme, and to determine whether this influence differs according to walking ability level.

Methods: The sample comprised 68 women and 35 men who were community-dwelling participants in the age range of 61–85 years attending a physical activity programme. Walking speed was measured at maximum speed over six meters of distance. Their dynamic concentric muscle strength of the lower extremities (flexion and extension muscle groups) was measured on an isokinetic dynamometer. For the purpose of this study the walking speeds obtained were then dichotomized according to the median value (P50). This allowed us to classify participants as low speed walkers (LSW) and high speed walkers (HSW).

Results: After adjustment for age and % of body fat our data showed that in men but not in women walking speed was significantly associated with both extension peak torque/body weight (Rho = 0.48; p = 0.005) and flexion peak torque/body weight (Rho = 0.37; p = 0.023). No other statistical correlation was found.

Conclusions: Slow walking speed in older men is correlated with lower limb strength.

Keywords: Aging, walking, fitness, physical activity.

ACKNOWLEDGMENT

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PREF03

PHYSICAL ACTIVITY PREFERENCES AND FLUCTUATION AMONG THE STUDENTS AT THE LITHUANIAN ACADEMY OF PHYSICAL EDUCATION

Edita Vainienė, Kęstutis Kardelis

Lithuanian Academy of Physical Education, Kaunas, Lithuania

Background: The evidence of physical activity preferences and attitudes towards health promotion among freshmen from different groups is needed while maintaining a constant level of physical activity intervention.

Objective: To determine changes in the physical activity preferences of future physical education teachers and health educators.

Methods: The studies were carried out in the years 2000 and 2008 with students from the Lithuanian Academy of Physical Education. A standardized, self administered questionnaire was filled in by 577 fresher students (244 males and 333 females). In the year 2000 it was 263 students (105 males and 158 females) and, in the year 2008 – 314 students (139 males and 175 females).

Results: There were fewer students who wanted to attend special health training courses (coping with stress, remedial exercise, healthy nutrition) in 2008 than in 2000 (males 57.8% and 46.7%, $p < 0.1$; females 84.4% and 71.2%, $p < 0.02$). Females showed a more critical view of the environment of the academy than males and mentioned that there were fewer possibilities for healthy nutrition in the academy in 2008 than in 2000 (26.1% and 19.12% $p < 0.02$). After eight years students are using health promotion tools less often in the academy. The number of students who used vigorous and strengthening activities decreased in 2008 compared with the year 2000 (males 59.2% and 46.7%; females 47.7% and 22.5%, $p < 0.001$). Also less of them chose wellness centers (males 27.6% and 22.8%; females 37.0% and 11.6%, $p < 0.001$). There were fewer females who reported having participated in activities that made them sweat and breathe hard (2–3 times/week and more) in 2008 than in 2000 ($\chi^2 = 49.05$, $p < 0.001$).

Conclusions: The data suggest a need for intervention to promote physical activity among students who enter the academy and continue studying here.

Keywords: Health promotion, gender, freshmen.

PREF04

ASSESSMENT OF PHYSICAL ACTIVITY RELATED BEHAVIOUR AMONG THE ADULT POPULATION IN TBILISI, THE CAPITAL OF GEORGIA

Manana Beruchashvili, Levan Baramidze, Rezo Tataradze

National Center for Disease Control and Public Health, Tbilisi, Georgia

Background: Physical inactivity belongs among the leading preventable risk factors linked with premature mortality and the overall disease burden due to NCD in the country of Georgia. PA related behavior was included in the programme of the NCD RF Survey conducted among adults in Tbilisi in 2007 aimed to facilitate the developing of RF surveillance system.

Objective: To estimate the prevalence of physical inactivity among adults, we wanted to utilize the information at hand for developing responses to needs, planning future interventions for the strengthened capacity of integrated NCD prevention and control, and establish NCD survey teams, which will be able to provide for surveys in other parts of the country of Georgia apart from Tbilisi and also at the national level.

Methods: Physical activity was assessed by asking 2742 respondents aged 25–64 years of both sexes about the time they spent doing different types of activities. We inquired about the frequency of performing different types of physical activity in a typical week, and the time spent doing these activities during the day was also assessed. The domains where physical activity was assessed included: work, travel to and from places (transportation), and recreation. The intensity of physical activity was categorized into vigorous, moderate and low intensity.

Results: Despite the fact that 92.6% of the respondents have a number of possibilities to exercise, 93.9% of the survey participants (91% male and 96.7% female) haven't practiced physical activities during the last 7 days, 55.1% of the respondents (59.1% male and 50.5% female) haven't done any moderate physical activities at all, 66.7% have spent more than an hour doing low intensity physical activities, 43.5% of the respondents (49.1% male and 38.2% female) have spent their time sitting for more than 6 hours daily, and 85.6% of those surveyed do any kind of leisure time physical activity (for at least 30 min.) leading to shortness of breath or perspiration only a few times a year or less frequently. At the same time, information for the personnel of primary health care was provided to them through the following brochures – be physically active, achieve and maintain a normal body weight; brochures were prepared (in printed form and as software) for primary health care workers and were disseminated at the health promotion event on Hypertension day.

Conclusions: The prevalence of physical inactivity and its determinants are very high. Probably it is one of the main reasons for the NCD burden in Tbilisi. It seems necessary to establish a stepwise surveillance system for what further steps are planned: conducting the survey at the national level; implementing the survey on regular a basis (within 3–5 years); involving all relevant stakeholders; continuous collaboration with WHO and other international organizations.

Keywords: NCD burden, NCD risk factor survey, preventable risk factors, premature mortality, risk factors surveillance system.

ACKNOWLEDGMENT

Non communicable disease risk factors survey in Georgia 2006–2007 was conducted by the Ministry of Labour, Health and Social Affairs of Georgia (MoLHSA) and the National Center for Disease Control and Public (Health NCDC & PH) with the support of the Regional office for Europe of the World Health Organization (WHO) 2006/2007. Design, production and analysis assistance for this project was provided by NCDC & PH and ACTS Georgia.

PREF06

WALKING AND HIKING OUTDOORS

Donald Roberson, Vesna Babić[1]

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic
[1] Faculty of Kinesiology, University of Zagreb, Zagreb, Croatia

Background: The purpose of this study is to understand more about the walking experience of those who are hiking and walking on a regular basis. Within the city limits of Zagreb, Croatia is a nature park and there are many hikers and walkers in this area.

Objective: Walking is the number one choice of exercise for many people. Walking takes place during one's free time. Also, walking is considered to be a natural way for exercise to take place.

Methods: There were three guiding questions used in our interview: Tell us about your hiking/walking experience, what do you enjoy about hiking/walking today at Medvednica and is there anything else you want to add about your walking/hiking experience at Medvednica? We would approach various walkers and ask if we could get their opinion of these questions. We would write down the answers on the survey.

Results: The findings center around three main experiences including being in nature and outdoors, mental and physical benefits, and interacting with others and the self. The main aspect for our research was the focus of the individual on nature and being outside. This centered around an appreciation for the "forest, trees, and woods", the experience of breathing fresh/clean air, and the quiet. Also mentioned were the colors of nature, the various aspects of the mountain, sounds in nature, and searching for and picking mushrooms. One walker emphasized: "For me walking is connection with earth – that is something divine." One mother stated while pushing her baby: "Not sure why it has this impact – but there is something about the nature, the wood, peace, quiet, it is green. The people I meet here, there is just a different type of energy here on the mountain." Another woman brought together the aspect of hiking and being outdoors: "For me hiking is health, well being, hiking fuels my life, the forest is life for me."

Conclusions: There are specific benefits, mental and physical from walking on a daily basis. Secondly, if the person can walk outside in a natural setting this will add to their enjoyment of this exercise by bringing the individual close to the natural world.

Keywords: Walking, nature, mountain, parks, interviews.

PREF07

PHYSICAL ACTIVITY IN THE PREVENTION AND TREATMENT OF DISEASE: A REPORT FROM A GOVERNMENT ASSIGNMENT IN SWEDEN

Lena Kalings, Carina Edling

Swedish National Institute of Public Health, Östersund, Sweden

Background: The book "Physical activity in disease prevention and treatment" summarizes up to date scientific knowledge in how to prevent and treat various conditions using physical activity. The book is designed for use as a tool for licensed health care staff in prescribing physical activities.

Objective: The goals were to spread the knowledge about the book FYSS, as well as support the development of training and education in the field of physical activity for disease prevention and treatment. The target groups were licensed or registered health care staff such as physicians, physical therapists, and nurses in Sweden.

Methods: Educational sessions were arranged together with all county councils in Sweden and held during 2008 and 2009. Information about the book was also spread to universities and communities via mailings. The various sessions were evaluated in questionnaires (web based and on-site).

Results: More than 4,000 health care staff in all Swedish county councils participated in the training. The evaluations demonstrated that:

- The majority of the participants were content or very content with the courses. Many of them thought that the courses contributed to a larger use of the book in their daily work.
- Managers of health centers answered that the book was used more than 50 percent of the time when prescribing physical activity.
- Among the participants in the educational sessions, 70 percent answered that they use the book in everyday work. The main reason that the book was not used was a lack of time. More than 90 percent of the respondents answered that the book was user friendly. The book was used as a tool or handbook, but there is room for improvement. For example there is a lack of information about physical activity for people with disabilities.

Conclusions: There is a need for more training and education in the field of physical activity for the prevention and treatment of disease. There is also a need for more research in the field of physical activity as a way to prevent and treat diseases. The book has been revised and translated into English to be used as a tool in work with physical activity as a way to prevent and treat diseases.

Keywords: Physical activity in disease prevention and treatment.

ACKNOWLEDGMENT

Written by 95 experts, the book is produced by the Swedish Society of Sports Medicine and published in cooperation with the Swedish National Institute of Public Health (SNIPH).

PREF09

INCLUSION OF STUDENTS WITH PHYSICAL DISABILITIES IN PHYSICAL EDUCATION IN THE CZECH REPUBLIC

Lucie Rybová, Martin Kudláček

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: The purpose of this study is to analyze the current position of inclusion in general physical education (PE). Even though students with disabilities constitute the majority of individually integrated pupils, this topic isn't very well understood. Inclusion in the context of school physical education is definitely a unique phenomenon making possible the comprehensive development of a pupil's personality.

Objective: The main aim of that study is to present the results of the research on how many integrated students with physical disabilities took part in PE.

Methods: The survey was organized in 2009 in primary schools and the research sample consists of 111 respondents (PE teachers of 68 boys and 43 girls with physical disabilities). Data were obtained through the standardized questionnaire.

Results: We found out that from 111 integrated students 60 take part in PE. Most of them (76%) have the lightest disabilities. Through these surveys it was found that less than half of parents (63%) support the inclusion of their children in physical education. Support by managers of schools was at the rate of 40%. The most common complications are based on the type of disability. Muscles rigidity, dyscoordination, ease fatigue and fear of failure may negatively affect the course of instruction. Other issues affecting the participation of students with physical disabilities in PE are connected with the lack of teacher assistants (31%) and compensatory tools (20%), lack of barrier – free access (7%), lack of experience in the field of Adapted Physical Education (APA) (12%) and the lack of professional knowledge (13%).

Conclusions: There are a number of important factors affecting the ease of inclusion – lack of funds, poor support by the family, and a lack of teacher competence in the field of APA. These decisive factors significantly affect the process of inclusion. The essential premise of the successful integration of students with physical disability is to create optimum conditions particularly at schools (material, personnel). Also, the family of the child with a disability must take certain steps to improve the process.

Keywords: Inclusion, pupils with special educational needs, Adapted Physical Education, teacher assistant.

PREF10

PREDICTING COMPLIANCE WITH PHYSICAL ACTIVITY GUIDELINES FOR CHILDREN AND ADOLESCENTS

Darko Jekauc, Matthias Wagner, Klaus Bös, Alexander Woll

University of Konstanz, Konstanz, Germany

Background: Being physically active is an important condition for the healthy development of children and adolescents. For this reason, the WHO has published specific physical activity guidelines. Their recommendation is that children and adolescents should have 60 minutes or more of moderate to vigorous physical activity per day.

Objective: The objective of this study is to provide nation-wide representative data for physical activity and sports in Germany and to analyse socio-demographic predictors of compliance with the physical activity guidelines for children and adolescents.

Methods: The target population of the study are all children and adolescents living and registered in the Federal Republic Germany aged between 4 and 17 years. The participants of the study were recruited in 167 sample points across Germany. The sample consists of 4529 children and adolescents who were tested in regard to physical activity, motor fitness, and health status. The measurement of compliance with the activity guidelines was conducted on the basis of the screening questionnaire by Prochaska, Sallis and Long (2001).

Results: Looking at the whole sample, only 15.3% of children and adolescents meet the 60 min. guideline. The proportion of girls (13.1%) meeting this guideline is significantly lower than the proportion of boys (17.4%). Every third child of kindergarten age achieves this activity guideline, however in primary school compliance with the activity guidelines is reduced to only every fifth child. With the transition to secondary school, less than 10% of adolescents meet the 60 min. guideline. Finally, in the age group between 14 and 17 years every 20th girl and every 12th boy complies with the activity guideline.

Conclusions: These results suggest that only a small percentage of German children and adolescents are sufficiently physically active und emphasise the importance of endeavours to promote physical activity and sports among children and adolescents. Furthermore, the results of this study lead to the conclusion that the proportion of children and adolescents who meet the physical activity guidelines decreases with increasing age. As compliance with the physical activity guidelines changes from childhood to adolescence.

Keywords: Physical activity, guidelines, compliance, children and adolescents.

PREF11

SUSTAINABILITY OF PHYSICAL ACTIVITY DURING ADOLESCENCE: INSIGHTS FROM A MIXED METHODS STUDY

Mathieu Bélanger, Michelle Casey, Marc Cormier, Annie Laflamme-Fillion, Geneviève Martin

Universite de Sherbrooke, New Brunswick, Canada

Background: Better knowledge on why some individuals succeed in maintaining participation in physical activity throughout adolescence is needed to guide the development of effective intervention to increase and then maintain physical activity levels. Despite allowing an in depth understanding, qualitative designs have infrequently been used to study physical activity sustainability.

Objective: To explore adolescents' perceptions of factors contributing to the maintenance and the decline of physical activity during adolescence.

Methods: Questionnaires were administered to 515 grade 10–12 students. The Physical Activity Questionnaire for adolescents was used to determine physical activity level at the end of adolescence. An adapted version of this questionnaire was used to estimate physical activity in early adolescence. Four categories (2 per sex) of participants were identified: adolescents who had sustained a high level of physical activity since grade 7 and adolescents who had declined. For each category, 2 groups of 10 students were randomly selected to take part in focus group discussions. Recordings were analyzed for emerging themes by three researchers separately.

Results: Seven focus group meetings with 6 to 8 participants in each were held. Of the 12 themes identified, the ones most prominently associated to sustainability of physical activity were physical and psychological well being, self esteem and valorization, family, and sport team and coach. Boys awarded marked importance to the influence of family and to the improvement in physical appearance resulting from physical activity. Girls were highly susceptible to influences from peer pressure as well as from sport teams and coaches. Boys and girls with a decline in their physical activity level during adolescence distinguished themselves from sustainers by reporting accessibility and time as barriers to the practice of physical activity.

Conclusions: Although other studies have looked at physically active and inactive adolescents, this is one of the first to qualitatively study physical activity sustainers and decliners. This study provides novel and confirmatory information for the development of individual and community level interventions.

Keywords: Mixed methods, qualitative analysis, sustainability, decline, adolescence.

ACKNOWLEDGMENT

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PREF12

SOCIAL FUNCTIONING AND ADHERENCE TO EXERCISE INTERVENTION IN OLDER ADULTS WITH ARTHRITIS

Dina Jones, Ruoxin Zhang, Jennifer Eicher, Rose M. Pignataro, R. Turner Goins

West Virginia University, Morgantown, WV, USA

Background: Better physical and mental functioning are associated with greater adherence to exercise in older adults. Less attention has focused on the role of social functioning as a predictor of adherence. Although social functioning can improve with exercise, few studies have examined its association with adherence in people with arthritis.

Objective: To determine if baseline social functioning predicted adherence in people with arthritis in a 12 week, evidence based, community delivered intervention using the EnhanceFitness® group exercise program.

Methods: Sedentary adults with self reported physician diagnosed arthritis were recruited from 8 counties in West Virginia to participate in the exercise program. Data were collected on demographics, arthritis symptoms, performance-based physical function, behavioral factors, and health related quality of life (SF-12). The SF-12 measured social functioning as the amount of time that physical or emotional health interfered with social activities. Adherence was defined as the proportion of classes attended out of 36 (low [referent group]: < 50%, moderate: > 50% – < 75%, and high: > 75%). Multinomial logistic regression was used to determine if social functioning was a predictor of adherence.

Results: The study included 173 participants (83% female) with a mean age of 69 + 10.4 years. Univariate predictors of greater adherence included lower fatigue; better general and mental health; and higher physical function, self efficacy, outcome expectations, social functioning, and vitality. The odds ratios and 95% CI in the models were: 1. moderate versus low adherence – social functioning (1.0; 0.98–1.06), fatigue (0.9; 0.78–1.10), and outcome expectations (1.2; 0.61–2.30) and 2. high versus low adherence – social functioning (1.0; 0.96–1.04), fatigue (0.8; 0.68–0.95), and outcome expectations (2.9; 1.46–5.90) (R2 = 0.18). No variables predicted adherence between the moderate and low groups. For the high versus low groups, participants with a higher level of fatigue were 20% less likely to attend > 75% of classes as compared to those with less fatigue. Participants with lower outcome expectations were 66% less likely to attend > 75% of classes than those with higher expectations. A threshold for predicting exercise dose was observed as fatigue and outcome expectations did not emerge as predictors until > 75% of classes were attended.

Conclusions: Although social functioning may be a predictor of adherence when considered alone, it may be influenced by fatigue and expectation levels and thus, may be serving as a proxy for other physical and mental health factors.

Keywords: Social functioning, adherence, exercise, arthritis, physical activity.

ACKNOWLEDGMENT

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PREF13

SPORTS PREFERENCES OF STUDENTS WITH CEREBRAL PALSY

Miroslava Spurná

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: Regular and optimal physical activity is primarily one of the prerequisites for obtaining and maintaining the physical and mental fitness of all individuals. Reasons why students with physical disabilities prefer different types of physical activity may be an important indicator in the development and implementation of motor programs for these students.

Objective: The aim of the study presented in this paper was to find out the sport preferences of students with cerebral palsy (CP).

Methods: Students with CP from primary and secondary school Credo in Olomouc participated in a survey organized in 2008. The research sample was represented by 11 students, 5 of whom are from the group "standing students" (walking without mobility aids) and 6 of them are from the group "sitting students" (wheelchair users). Their preferences for sport activities were elicited by the pair-comparison method. For pair-comparison, 10 sports were selected, five of which could be done within the context of physical education (PE) and five sports which could be done in a PE environment.

Results: Generally their most preferred sports included skittles, swimming and boccia. We found differences in sport preferences between the groups of students who were "sitting" or "standing". Students from the sitting group preferred their sports in the following order: boccia, skittles, swimming, floorball, archery, wheelchair basketball, athletics, badminton, volleyball, and wheelchair rugby, whereas the group of standing students preferred their sports in the following order: skittles swimming, badminton, boccia, hockey, athletics, archery, basketball, volleyball, and rugby. Selected students prefer the particular sport they know and with which they have their own experience within lessons of PE. In sitting students in their selection of sports a sense of competence for that sport played an important role. The sport preferences of sitting students related in to a sense of competence in that sport.

Conclusions: Knowledge, personal experience and feeling for the successful handling of the sporting discipline are important factors that affect an interest in active participation in various physical activities.

Keywords: Cerebral palsy, physical disabilities, sport activities, sports preferences.

ACKNOWLEDGMENT

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PREF17

COMPARISON OF SELECTED RESEARCH METHODS USED IN EXPLORING THE PERCEPTION OF INTERPERSONAL RELATIONSHIPS BETWEEN PROFESSIONAL AND RECREATIONAL SPORTS TEAMS

Anastasiya Khomutova, Simona Šafaříková

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: Attitudes towards sport and physical activity differ in developed and developing countries. The methodology of this research will be focused on interpersonal relationships in culturally, economically and socially different sport teams.

Objective: The aim is to present the methodology of examining the group dynamics and its perception by individuals in different groups and environments. The project result is the comparison of the methodologies applied to the sport teams of developed and developing countries.

Methods: The methodology proposed for this study is based on semi-structured interviews, focus groups, scaling and observation. All these methods will be modified for a foreign language environment, since the research will proceed mainly in the English language. The same methodology will be applied by both researchers in their selected cultural and socio-economic areas. Both projects will be applied directly in the field (European and African states). The project will be ended with a co-evaluation of the obtained data and discussion of usability of the invented methodology.

Results: The result will be the comparison of selected research methods used in professional and recreational sports teams in culturally, economically and socially different environments.

Keywords: Group dynamics, recreational sport, professional sport, multiculturality, developing countries.

PREF18

PREFERENCES OF PARTICIPATION IN REGULAR PHYSICAL ACTIVITY IN ELDERLY WOMEN: COMPARISON OF SELECTED PHYSICAL CHARACTERISTICS OF SEDENTARY VERSUS PHYSICALLY ACTIVE WOMEN OVER THE AGE OF 70 YEARS

Julie Wittmannová, Dagmar Nemček[1]

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic
[1] Faculty of Physical Education and Sports, Comenius University, Bratislava, Slovak Republic

Background: The importance of "active ageing" is an up to date topic in the field of physical activities (PA). The need for an active life style supported by participation in regular PA is well documented. To support these findings in an older population (women 70+) our research is measuring the input level of some physical characteristics.

Objective: The objective of our pilot research is to evaluate the level of some physical characteristics of elderly women (70+) and compare results between a physically active and a sedentary group. Our hypothesis states that the better results with regard to the physical characteristics can be seen in physically active women.

Methods: The experimental sample was composed of 58 women [their participation in PA: those who were physically active (30) exhibited twice a week participation in an organized group of PA, 28 were sedentary] the tests used are divided into 1. flexibility tests such as the Sit and Reach test (Topendsports, 2009), lateral spine flexion/spinal lateral fexion (Kyselovičová et al., 2002) and the Back Scratch test (Rikli & Jones, 2001), 2. the test of static balance called the stand/standing on one leg test (Briggs et al., 1989), 3. the 8 foot up and go test (Rikli & Jones, 2001) and 4. the standing on a chair test (Rikli & Jones, 2001).

Results: The average values of all achievements were predictably higher in physically active women, but statistically significant differences were only measured in the flexibility test called sit and reach ($p < 0.01$); thenthe standing on a chair test and the 8 foot up and go test ($p < 0.05$). The presentation exhibits examples of research work strengthening these findings – especially in the application of long term programs with goal directed types of exercises and PA; for example the special stretching and joint flexibility program.

Conclusions: This pilot study will be followed by the application of a PA program partly configured via our findings. Also the findings of other authors are mostly suggesting the use of specific training programs supporting single physical characteristics (flexibility, strength, endurance, etc.).

Keywords: Ageing, physical abilities, motor tests.

ACKNOWLEDGMENT

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PREF19

SAFE AND ACTIVE SCHOOL DAY – WELL-BEING PARTNERSHIP

Riitta Asanti, Anu Oittinen

University of Turku, Turku, Finland

Background: There is an increasing inactivity in our modern life style – especially the polarization between active and passive activities, for example increasing "screen time". There is a low level of involvement and participation in PA at a school community level involving a low level of the "feeling fine in school" aspect vs. good academic results and ratings. There is also an increasing disparity and inequality of individual well being caused by socio-economic factors.

Objective: To encourage an active life style in children and youth, increase their participation and involvement, strengthen their feeling of togetherness and build a new model of well being partnership. Through school we reach the whole target group as well as their families.

Methods: Project management and coordination is needed to create functional operational and strategic structure for the project. Meetings, seminars and training sessions are essential in order to produce innovations of concrete actions on a school level and to enable the exchange of ideas. Equipment and materials for school activities and campaigns are needed to enable the activating, participatory and involving practices at school level. We have to inform all focal interest groups and actors about the project and its goals and to raise awareness about those issues. Evaluation and modeling is important in order to produce reliable and valid information about and evaluation of the project.

Results: A new model of organisational and operational structure for sustainable and successful development activity in schools, between schools and on a city level. Activating methods and tools to increase participation and involvement at school level: a) equipment, activation materials, training, campaigns, b) a new way of organising school afternoon activities which promote participation in cooperation with other actors working with children and adolescents, c) the idea of an "extended schoolday". Activating environments: a) school yards planning and development, b) co-operational model and methodological "tool box" for participatory and involving planning. Data (quantitative and qualitative) about the life style of children and youth and their perceptions of an active and safe school day, and project evaluation done by teachers and principals. New innovative operative and financial models for the preventive promotion of the health and well being of children and adolescents – well being partnership model: actors, roles, responsibilities.

Conclusions: It is important to carry out city level projects to guarantee the equity of the whole target group (children and youth). It is important to support the active life of children and youth because it results in positive attitudes towards school.

Keywords: City level intervention, school level activities, active school day, participation and involvement.

PREF21

CONTRIBUTION OF A PHYSICAL ACTIVITY FRIENDLY SCHOOL ENVIRONMENT TO REDUCE THE INCREASE IN INACTIVITY OF FIRST AND SECOND GRADE SCHOOLCHILDREN: A THREE YEAR LONGITUDINAL STUDY IN THE CZECH REPUBLIC

Erik Sigmund, Dagmar Sigmundová, Romana Šnoblová, Walid El Ansari[1]

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic
[1] Faculty of Sport, Health and Social Care, University of Gloucestershire, Great Britain

Background: Intervention programmes effectively increasing physical activity (PA) in children, adults, and seniors have been modeled and tested worldwide. It is useful to apply intervention PA programmes for children in a school environment because they spend most of their weekdays there, and therefore PA, nutrition and education benefits can be developed there.

Objective: To assess the association between schools' PA friendly environment to the extent of the reduction of the PA in first and second-grade schoolchildren.

Methods: PA was measured in randomly selected girls (n = 84) and boys (n = 92) aged 5–8 years using the Caltrac accelerometer [active energy expenditure (AEE kcal/kg/day)] and Yamax pedometer (STEPS number/day). Participants were monitored continually over 7 days. Baseline measurements were obtained at kindergarten (Sept. 2005). After the first monitoring at the first grade of elementary school (Sept. 2006), children were divided into control (girls = 41, boys = 47) and experimental (girls = 43, boys = 45) groups. These groups were monitored again at the end of first grade (Apr. 2007) and then twice in the second grade (Sept. 2007, Apr. 2008). Gender/group comparisons of AEE and STEPS were undertaken (two way ANOVA with repeated measures).

Results: In both genders, the transition from kindergarten to the 1st grade of elementary school was associated with a major decline in AEE and STEPS ($p < 0.0001$), which was more than the decreases associated with the transition from the 1st to the 2nd grades. Throughout the 1st grade, during school time, experimental group children repeatedly achieved significantly higher levels of AEE and STEPS (boys = 1.15–1.33 and 1,133–1,332, girls = 1.08–1.22 and 1,213–1,428, $p < 0.001$) than the controls. There was no decline in leisure time and total daily (combined school and leisure time) time PA in the experimental group, in contrast to controls that showed a decline in both. Similar patterns were observed when these children reached the 2nd grade of elementary school.

Conclusions: APA friendly school environment can contribute to stopping the decrease in the PA levels of first and second grade schoolchildren. As PA friendly school environment comprised the use of PA stimulating aids during breaks and free access to the school gymnasiums/sport fields for children.

Keywords: School environment, energy expenditure, number of steps, school and leisure time, boys, girls.

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PREF22

PHYSICAL ACTIVITY PREFERENCES OF STUDENTS WHO ARE DEAF OR HARD OF HEARING

Petra Kurková, Erik Sigmund

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: Regular physical activity is very important, especially for students who are deaf or hard of hearing and potentially otherwise isolated. From the point of view of the health aspect in their adulthood, especially the educational fields of health and physical education are crucial for these students.

Objective: The purpose of this study was to compare the preferences in leisure time activities and the knowledge of students who are deaf or hard of hearing in both schools settings (general or segregated education) with regard to sport and physical activities related to this community.

Methods: Participants in this study were integrated students who are deaf or hard of hearing (n = 7), whose average age was 14.43 ±1.27 years. These pupils were compared with students from schools for the deaf (n = 32; age 15.19 ±1.24 years). By the questioning of students who are deaf or hard of hearing in both schools settings with regard to sport initiation and sports activities related to the deaf community, their preferences in leisure time activities and the knowledge were surveyed.

Results: The settings for extracurricular physical and sports activities varied depending on the type of school (residential or nonresidential). As regards sport initiation, logically students who studied at residential schools for the deaf were initiated into sport by their teacher of physical education. In students who are deaf or hard of hearing from general schools, their parents had a significant impact on their initiation into sport. Differences found in sport initiation and the organizing of leisure time for students who are deaf or hard of hearing from both kinds of schools follow from the different functioning of schools for the deaf. When comparing general schools to schools for the deaf, physical education teachers at schools for the deaf were qualified in special pedagogy or adapted physical activities more often than physical education teachers at general schools. From the answers of students enrolled in both general schools and schools for the deaf, it appears that they have minimal knowledge about hearing and deaf athletes.

Conclusions: The obtained results are possible to summarize into the following recommendations:

- Create a friendly environment in school settings, not only for students who are deaf or hard of hearing and their classmates, but also for their teachers.
- Observe the principles of correct communication and make use of technological equipment.
- Include in schools an educational program providing information about successful athletes and deaf sport.

Keywords: Deaf sport, extracurricular activity, leisure time, school setting.

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PREF23

PHYSICAL ACTIVITY BOOSTS PHYSICAL SELF-CONCEPT AND SELF ESTEEM IN OBESE WOMEN

Nadine Zillmann, J. R. Grove, B. Jackson, S. Byrne, E. Dove

University of Vienna, Institute of Sport Science, Vienna, Austria

Background: Regular engagement in physical activity is proven to decrease morbidity risks and to improve mental well being. However, physical activity levels are continuously in decline, and sedentary lifestyles are a significant contributor to rapidly rising obesity levels. Furthermore, obesity and inactivity are both closely related to poor self concept and reduced self esteem.

Objective: By assessing multiple dimensions of physical self concept and global self esteem during participation in a 12 week weight management program, this longitudinal intervention study examined the extent to which involvement in physical activity influences individual self perception.

Methods: Obese women [N = 64, Mage = 46.7 (±12.9), MBMI = 34.4 (±6.4)] enrolled in a 12 week cognitive-behavioral therapy weight management program. Participants were assigned to one of three groups: (1) cognitive-behavioural treatment (CBT) only (n = 21), (2) CBT plus exercise (n = 23), or (3) non treatment control (n = 20). The exercise group attended three supervised exercise sessions per week in addition to weekly CBT group sessions. Measures of exercise activity, physical self-concept, and global self esteem were obtained at baseline, at weeks 3, 6, and 9, and after the intervention. Weight change was recorded weekly.

Results: Two way mixed model analyses of variance showed that participants in both CBT groups significantly decreased their body weight ($t = 5.59$, $p < .001$). Overall, weight loss was small (M = 3.36 kg (±3.66), corresponding to an overall weight change of 3.75%. Despite this comparatively small weight loss, participants in both treatment groups displayed improvements for selected dimensions of physical self concept (e.g. Appearance [$F(2,61) = 2.49$, $p = .04$]). However, CBT plus exercise produced greater improvements in a number of physical self concept dimensions (e.g. Flexibility [$F(2.61) = 7.07$, $p = .002$] when compared with CBT treatment alone). With respect to self-esteem, participation in the intervention resulted in significant improvements in both treatment groups [$F(2.61) = 2.45$, $p = .04$]. Moreover, participants who combined regular exercise with the CBT intervention exhibited greater improvements in self-esteem compared to their peers in the CBT – only group [$F(1.22) = 5.83$, $p = .002$]. Consequently, these findings contribute to the growing body of literature showing positive effects of exercise on psychological well being.

Conclusions: Adding physical activity components to a CBT weight management program engendered greater psychosocial benefits than CBT alone. This study provides evidence that physical activity is a necessary element of weight management programs seeking to enhance health status and psychological well being.

Keywords: Obesity, physical activity intervention, physical self concept, self esteem.

PREF24

ANALYSIS OF INCLUSIVE LESSONS OF PHYSICAL EDUCATION RELATING TO PHYSICAL DISABILITIES

Radka Bartoňová, Adnan Ahmetašević, Hana Válková

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: There is a lot of evidence supporting the fact that physical activity and physical education are important for children with disability (Block, 2000; Van Coppenolle, De Potter, Van Peteghem, Djobova, & Wijns, 2003; Sherrill, 1998; Jowsey, 1992). According to Sherrill (1998), the best approach to the design of successful inclusion is creating physical activity environments that respect diversity and encourage individual improvement.

Objective: The main objective was to compare PE inclusive lessons of children with different types of physical disabilities and confront the results of these children in basic categories, which are inclusive, parallel or separate.

Methods: Four PE inclusive lessons for children with physical disabilities at the elementary school level were assessed. We used the following instruments of assessment – Didactic Inclusive Categories – Critical Incident Techniques, DIC – CIT. The research was based on observation and categorical scaling combined with chronometry (Pieron & Cheffers, 1973; Halamičková & Válková, 2003). Basic categories were: inclusive (cognitive- emotional, with or without modification, supportive, with an assistant), parallel (like others, extra), separated (other program, time out, no activity). The first version of verification of the DIC – CIT instrument showed 91.00% of congruency between two independent observers (Válková, Ahmetašević, & Bartoňová, 2010). The time of observation in each category was counted in percentages.

Results: We measured four children with different types of physical disabilities. A child with autism, a child with neuropathy, a child with cerebral palsy associated with mental disabilities and a child with cerebral palsy with a disorder of stabilization. Each of them had an assistant, except for the child with neuropathy. Only the child with autism did some parallel activity (parallel extra 37%). The child with a disorder of stabilization did all the activities with modification (inclusion of modification – 14.3%, modification with assistance 34%). Modification when at rest was as follows: 21.4% was the measurement for the child with neuropathy, 9.2% in the child with autism and only 2.1% was measured in the child with cerebral palsy associated with mental disabilities. Time when the children were obtaining some information (cognitive-emotional) formed a substantial part of the lessons: in the child with autism this comprised 27.8%, in the child with neuropathy – 39.7%, in the child with cerebral palsy associated with mental disabilities – 51.4%, and in the child with cerebral palsy with a disorder of stabilization it was 50%. The biggest difference in the time across all categories was seen in the child with autism and the child with cerebral palsy with disorder stabilization. Both were more dependent on their assistant then the other children.

Conclusions: Modifications in PE are necessary for most children with physical disabilities. What and how much modification is needed depends on the type of disability, type of lesson and other factors. It is not possible to give instructions, but only to explain principles of how to include children with physical disabilities in PE.

Keywords: Inclusion, children with physical disabilities, physical education, didactic inclusive categories.

PREF25

EXERCISE LOOKS AFTER YOU FOR PEOPLE WITH INTELLECTUAL DISABILITIES

Narcis Gusi, Pedro R. Olivares, Serafin Delgado, Fabian Quesada, Nuria Fernandez, Clarencio Cebrian

Faculty of Sport Sciences, University of Extremadura, Caceres, Spain

Background: Individuals with intellectual disabilities have problems accessing regular public programs to promote physical activity. Analyzing this problem of inequality, the regional government of Extremadura has implemented a new public health subprogram for people with intellectual disabilities within the framework of the regional program Exercise Looks After You (ELAY).

Objective: The main objective of this program was to improve the public health system attending people with intellectual disabilities and to analyze the effect of a specific public physical activity program in personal autonomy, fitness and Health Related Quality of Life (HRQoL).

Methods: A specific physical activity program was performed twice a week for 4 months in 17 local associations of people with intellectual disabilities from the Spanish region of Extremadura. The program was directed by Sport Sciences graduates who worked in the ELAY program. Fitness was measured using the Eurofit Special fitness battery, except for the balance test which was measured using Functional Reach (FR) and Timed Up and Go (TUG) tests. HRQoL was measured by proxy using the EQ-5D and 15-D© questionnaires.

Results: Individuals with intellectual disability (237) were randomly allocated in exercise (137) and control (100) groups. After the physical exercise intervention there were improvements in velocity and shoulder mobility, but there were no statistically significant changes in HRQoL. A longer exercise program is necessary to improve HRQoL in people with intellectual disabilities.

Conclusions: A public health program based on four months of exercise intervention in people with intellectual disabilities improves mobility but not HRQoL.

Keywords: Exercise, fitness, intellectual disabilities, public health.

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PREF26

THE EFFECT OF PHYSICAL ACTIVITY ON COORDINATION ABILITIES OF MOVEMENT ADAPTATION IN ELDERLY WOMEN

Lenka Tlučáková, Róbert Kandráč, Ján Junger

Faculty of Sports, University of Prešov, Prešov, Slovak Republic

Background: Recent findings have shown that exercise is an effective intervention strategy in warding off or even reversing the ageing process. However, there is a paucity of studies on the effect of exercise on coordination abilities in the elderly population.

Objective: The purpose of the study was to examine the effect of a 2 month supervised exercise program on coordination abilities of movement adaptation in elderly women.

Methods: The sample comprised 15 elderly women of the average age of 62 years. The motor coordination measures were assessed using field based motor tests of coordination at baseline and were repeated after 2 months of exercise.

Results: The intervention subjects attended exercise sessions consisting of aerobic and resistance exercise over two months. At retest, there were significant improvements in both abilities of movement adaptation: reaction speed and the ability to change movement direction. The findings are quite surprising due to the strong genetic determination of the examined abilities.

Conclusions: These findings indicate that participation in a supervised exercise program can improve coordination abilities, which may increase the quality of life in an elderly population.

Keywords: Exercise, coordination abilities, elderly, quality of life.

PREF27

THE EFFECT OF PHYSICAL ACTIVITY ON FUNCTIONAL FITNESS IN ELDERLY WOMEN

Lenka Tlučáková, Róbert Kandráč, Peter Bakalár, Ján Junger

Faculty of Sports, University of Prešov, Prešov, Slovak Republic

Background: Having the physiological capacity to perform normal everyday activities safely and independently without undue fatigue (Rikli-Jones, 2001), i.e. functional fitness, is an underlying factor of quality of life in the elderly population. With respect to older people, researchers are faced with the task of reversing the functional decline.

Objective: The purpose of the study was to evaluate the effect of a 3 month supervised exercise program on functional fitness in elderly women.

Methods: Twenty one elderly women (average 61.7 years) participated in an aerobic resistance supervised exercise program twice weekly. The Senior Fitness Test battery (Rikli-Jones, 2001) to assess the physical parameters: upper and lower body strength, upper and lower body flexibility, aerobic endurance and agility/dynamic balance associated with independent functioning in older adults was carried out at baseline and after 3 months of exercise.

Results: The results show that combined aerobic and resistance exercise performed twice weekly over three months resulted in significant improvement of upper and lower body strength. The intervention subjects did not improve on the physical parameter of flexibility probably due to lack of flexibility-specific exercise. There was also no significant improvement in aerobic endurance and agility/dynamic balance.

Conclusions: In summary, results of the study suggest that using combined aerobic and resistance exercise program can improve functional fitness in older adults primarily in terms of upper and lower body strength.

Keywords: Exercise, physical activity, older adults, functional fitness, senior fitness test.

PREF28

SOCIOLOGICAL ASPECTS OF MEN'S DANCING PREFERENCES

Jessica Maertin, Tereza Vrbová

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: Why are men involved in dance activities? Do they also participate in the social life of the dance group? We have limited the scope of our enquiry to adult males in amateur, not for profit groups in the Czech and Slovak Republics, regardless of their nationality.

Objective: Our aim is to find out the reasons why men participate in country, folkloric and historic amateur free time dance groups. This information may serve to attract more men to this physically, socially and psychologically healthy activity.

Methods: The research population selected comprises adult male members of amateur free time dance groups. The data are collected through semi-structured questionnaires distributed either by email or in person – with the participation of leaders of free time activity groups. The collected data are processed; basic statistical characteristics are used.

Results: We expect that men's decision to start and continue dancing in amateur free time groups is mainly influenced by their family traditions, places of residence and friendly contacts. Financial considerations also may play a role.

Conclusions: On the basis of the results acquired we have seen that a key role is played by social contacts both in the decision to start dancing as well as in choosing to continue in the men who participated. Another factor that seemed to be important for many of the men was the desire to learn new skills and enjoyment felt as a result of such learning. More research will be needed on a larger sample of respondents to confirm these results.

Keywords: Free time activities, country dance, folkloric dance, historical dance, dancing men.

ACKNOWLEDGMENT

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PREF29

POSTURAL EXERCISE PROGRAM ON THE INTERNET IS USEFUL FOR REDUCING THE PROBLEMS OF WORKERS WITH NONSPECIFIC BACK PAIN

Narcis Gusi, Borja Del Pozo-Cruz, Jose A. Parraca, Jose C. Adsuar, Miguel A. Hernandez-Mocholi, Hector A. Corzo

Faculty of Sport Sciences, University of Extremadura, Caceres, Spain

Background: Non specific back pain is one of the major reasons for primary care in Europe with visit ratios ranging from 7 to 9% of total primary care visits. Postural exercise and education (multi component intervention) have shown their effectiveness in the treatment and prevention of nonspecific lower back pain.

Objective: The aim of this study was to check the effectiveness of a postural exercise and education training program via the web in solving the problems of workers affected with nonspecific lower back pain.

Methods: The subjects were randomly assigned into a control group (50) and a treatment group (50). All participants have access to their personal user name and password in a web portal, where on Monday, Wednesday and Friday they had a workout and different postural education posted. The treatment group received an email to remind him to make the session. The main measures taken were incapacitated because of sore backs and back strain (Oswestry and Roland Morris), fitness related back pain (lumbar abdominal strength and force manual) and Health Related Quality of Life (HRQoL) with EQ-5D. All measures were evaluated at baseline and after 8 months of the program.

Results: Adherence to treatment in the intervention group was 92%. There were improvements in the degree of disability related to back pain as measured by Oswestry (45%, $p < .001$) and Roland-Morris (77%, $p < .001$). There were also improvements in the HRQoL (21%, $p < .001$). Likewise, patients adhered to treatment and improved their lumbar resistance (26%, $p < .001$) and their abdominal strength (44%, $p < .001$).

Conclusions: This multi component program improved physical condition, quality of life related to health, as well as a decrease in disability and risk of chronic non-specific back pain in office workers. . It is also effective for treatment adherence.

Keywords: Nonspecific low back pain, pain, inability to work, quality of life.

PREF30

WALKING FOR WELLBEING IN THE COMMUNITY: EVALUATING THE TRANSFER INTO PRACTICE OF A RESEARCH-LED WALKING INTERVENTION

Chris Gourley, Chloe McAdam, Claire Fitzsimons, Nanette Mutrie

Sport, Culture and Arts Jordanhill Campus, University of Strathclyde, Glasgow, United Kingdom

Background: The link between poor health and lack of physical activity is well established, while extreme health inequalities correlated with socio-economic status have recently become increasingly apparent. Therefore the research agenda is concerned with identifying feasible and measurable interventions that support individuals throughout the population in order to increase their physical activity levels.

Objective: To evaluate the implementation of the Walking for Wellbeing programme in real world settings, identifying the mediators and moderators of effective implementation. This builds on prior work undertaken by our research group which included a Randomised Control Trial.

Methods: A multi methods approach is being employed consisting of the following – Process Measures: Semi-Structured Interviews, Video recording of PA Consultations, Checklist for Group Facilitators, Open ended questions in step count diaries, Project challenges and facilitators' monitoring form, Review workshops with group facilitators, Research Diary, Field Notes, Intervention Processes Monitoring Form, Outcome Measures: Baseline/12wk/24wk 6 day pedometer step counts, Questionnaires (PA stage of change/PANAS/self efficacy/IPAQ long form) at baseline/12wk/24wk.

Results: Participants (47) from 6 community and workplace groups engaged with the project at baseline. Of these, 56% live within the most deprived quintile of the Scottish Index of Multiple Deprivation. The mean baseline is a step count of 5,527 steps/day. Data Collection from process measures and follow up outcome measures is ongoing and will be finalised by October 2010. The data will allow identification of the necessary input in terms of actions and resources for the successful widespread implementation of WfW. It will also provide insight into the various challenges to implementation that may arise at certain stages and lead to the investigation of solutions to such challenges. Both environmental and psychological mediators and moderators as well as factors both intrinsic and extrinsic to the intervention itself will be identified.

Conclusions: Implementation of research findings in real world settings presents new challenges to researchers. In this phase of the development of the intervention we move from testing efficacy to establishing the effectiveness of the intervention, particularly within traditionally hard to reach communities.

Keywords: Walking intervention, real world settings, physical activity, health inequalities, dissemination, process evaluation.

ACKNOWLEDGMENT

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PREF31

PSYCHOMOTOR EXERCISES IN PATIENTS WITH PARKINSON'S DISEASE

Dagmar Trávníková, Marie Blahutková, Viktor Pacholík

Faculty of Sports Studies, Masaryk University, Brno, Czech Republic

Background: Parkinson's disease, affecting several percentage points of the senior population, and its symptoms, have impact on a wide range of functions and abilities of these patients. We have applied a set of psychomotor activities in order to ascertain the possible positive impact on the skills of those with Parkinson's disease.

Objective: The objective of our motor activity programme was to apply suitable psychomotor activities to patients with symptoms of Parkinson's disease in order to develop some of their skills and functions.

Methods: In our pilot project we have applied two motor activity programmes based on simple psychomotor exercises on patients with symptoms of Parkinson's disease. By means of observation and interviews with the patients we monitored whether or not psychomotor exercises represent a suitable form of motor activity for this specific group.

Results: During our pilot project with patients with symptoms of Parkinson's disease we have not acquired any data as our intention was firstly to introduce the test group into the field of the importance of physical activity even in patients with coordination and movement problems. We have emphasised the importance of psychomotor exercises and games that affect both the physical and psychological areas of the patients' health. As result of this successful pilot project we plan to implement a future research project in the field of the use of psychomotor exercises in order to influence the functions and skills of patients with Parkinson's disease.

Conclusions: In our pilot motor programme we have been especially successful with the application of exercises focused on the development of balance skills, fine motor skills, coordinated movements of the limbs as well as facial gestures and voice control exercises.

Keywords: Parkinson's disease, psychomotoricity, fine motor skills, physical exercise, motor activities programme.

PREF33

THE IN BALANCE PROGRAM MEASURES A 61% FALLS REDUCTION

Ger Kroes

Netherlands Institute for Sport and Physical Activity, Ede, the Netherlands

Background: Falls in the aging population pose a major threat to independence and to quality of life. The consequences of falls can be severe, including fractures, worsening of mobility and gait, and increases in the risk of mortality and morbidity.

Objective: The Netherlands Institute for Sport and Physical Activity (NISB) is doing a pilot project in 2010–2011 with a health insurance company which finances the fall training and after the training the municipality is taking care of the transition to regular activities.

Methods: The Free University in Amsterdam (Faber et al., 2006) did a 20 week, multicenter randomized controlled trial in 15 homes for the elderly with 278 participants with a mean age of 85 years. Positive effects of the "In Balance/ functional walking program" became apparent after 11 weeks of exercise. The power of the program is to create a situation that can be incorporated into daily life. That's why the program is based on consciousness by means of providing information about safety and an exercise program focused on strength, flexibility, reaction time and balance by the therapeutic elements of Tai Chi.

Results: The "In Balance" moderately intensive group exercise program has positive effects on the prevention of falling and physical performance in pre-frail elderly that can rise to over 60%. Also the feelings of the participants give us important information. People say: I'm more supple (65%), I can rise more easily from a chair (60%), my balance has been increased (40%), I feel better (38%) and my gait corrected positively (37%). Of the participants, 85% will continue the program, 50% once a week and 35% twice a week. Based on this data, NISB designed a 16 week program twice a week with a low psychological threshold, because many seniors with a fall risk are rather inactive. We built a 3 phase system; the elderly can choose whether they will continue their participation after every phase. After the program there has to be continuation in regular local exercise groups with permanent attention to balance exercises.

Conclusions: A high score in fall reduction compared with the effects of other effective interventions is highly promising. Falls in the elderly are a major health concern due to the financial impact on the public health care system.

Keywords: Elderly, falls, In Balance program.

PREF34

SOCIODEMOGRAPHIC AND HOME ENVIRONMENT PREDICTORS OF SCREEN VIEWING AMONG SPANISH SCHOOL CHILDREN

Itziar Hoyos Cillero, Russell Jago[1]

University of the Basque Country, Barrio Sarriena, Spain
[1] Centre for Exercise, Nutrition and Health Sciences, University of Bristol, Bristol, United Kingdom

Background: There is a higher prevalence of pediatric obesity in southern European countries. Higher screen viewing levels increase the risk of obesity. Many children exceed screen viewing guidelines. Understanding the correlates of screen viewing is an important first step in designing interventions. There is lack of information on the correlates of screen viewing among Spanish children.

Objective: This study aimed to (I) examine patterns of screen viewing (TV watching, computer and console games playing and overall screen viewing); and (II) identify socio-demographic, environmental and socio-cultural correlates of screen viewing in a sample of primary and secondary Spanish school aged children.

Methods: Sixteen schools were recruited from different socio-economic strata based on an assessment of the economic activity in Bilbao (November 2009–January 2010). Children reported screen viewing time and the presence of media devices in their bedrooms. Children were classified as exceeding screen viewing guidelines in accordance to the AAP (> 2hour/day). BMI was assessed and children were classified into obesity groups using IOTF cut off points. Parents reported socio-demographic (gender, age, education, family structure and characteristics), environmental (household media devices), socio-cultural variables (media practices and rules) and their BMI. Analyses: t-test, chi-square and logistic regression models (> 2hour/day TV and overall screen viewing as outcomes; socio-demographic, environmental and socio-cultural variables as exposure variables).

Results: Participants were 247 primary (379 invited, response rate 65.1%) and 256 secondary (457 invited, response rate 57.9%) school aged children and their parents. Secondary school aged children had more household ($P < 0.05$) and bedroom TV sets than primary school aged children ($P < 0.001$). More parents in the secondary school group spent > 2hour/day watching TV than in the primary school group ($P < 0.05$). Older children (TV viewing $P < 0.001$, console games playing $P < 0.01$ and overall $P < 0.001$) and males (TV viewing $P < 0.01$, console games playing $P < 0.001$ and overall $P < 0.01$) were likely to spend more time in screen viewing. Greater access to media sources was associated with higher screen viewing (both groups > 2 household TV sets $P < 0.05$; older children, presence of TV $P < 0.01$ and console in child's bedroom $P < 0.01$). Younger children from single parent households ($P < 0.001$) and older children having a younger parent ($P < 0.001$), siblings ($P < 0.001$) and a father that wasn't working ($P < 0.01$) were higher screen viewers. For older children parental TV viewing time ($P < 0.001$) appeared to be a significant correlate while parental rules (TV rules $P < 0.01$ and computer rules $P < 0.05$) was a significant predictor for younger children.

Conclusions: Environmental and socio-cultural factors influence children's screen viewing although they may operate differently during childhood. Parents play a central role in children's screen viewing, therefore intervention that targets environmental and family TV viewing practices are likely to be effective.

Keywords: Child, adolescent, obesity, screen viewing, correlates, health promotion.

PREF35

HEALTH PROMOTION FOR MUSIC STUDENTS – EVALUATION OF AN INTERVENTION PROJECT

Rosa Diketmueller

University of Vienna, Vienna, Austria

Background: Confronted with an increasingly large number of students suffering from medical problems, the need of a health prevention program became obvious at the University of Music and Performing Arts Vienna.

Objective: The project "music and muscles" (2007–2009) offered courses for students to strengthen their individual fitness as well as team – teaching courses with experts in spiral dynamics and the Franklin method to show students and teachers healthier ways of playing and teaching music.

Methods: The aim of the study was to investigate the implementation process and the effectiveness of this health program for the prevention of playing related health problems. It was hypothesized that the program would have positive effects on different aspects of health of the students and on their work as musicians in training. Of the students, 229 (203) participated in the evaluation studies with pre and post measurements (standardized questionnaires at the beginning and at the end of each course (Spahn, 2006; Spahn et al., 2001; Spaulding, 1995; Zander, 2006), document analysis of the program, interviews with the project coordinator, teachers and trainers).

Results: Based on the pre to post measurements of the students, the overall distress has decreased as well as playing related symptoms, general symptom frequency, and emotional disturbances and anxiety level. General coping with work as a musician and security in performance situations have improved and their behavior of practicing preventive exercises in their life and within daily routines of playing music have changed significantly. The teachers in general were very interested in the project, but only a few engaged themselves in the group courses. Although the project has initiated changes in the individual (health) behavior of the students (daily training, body awareness and posture), more measures will be necessary to build up sustainable structures for health promotion.

Conclusions: To build up sustainable structures for health promotion at university, health related topics within the curriculum as well as teachers as role models are important to distribute healthier ways in learning procedures, playing and performing music.

Keywords: Health promotion, intervention, music students, university, evaluation.

PREF36

WALKING GROUPS

Stefania Pascut, Gianna Zamaro, Riccardo Riva, Simonetta Micossi, Luciano Ciccone

Municipality of Udine, Udine, Italy

Background: As highlighted by WHO publication "The solid facts: Promoting physical activity and active living in urban environments", physical activity is an essential component of any strategy that aims to seriously address the problems of sedentary living and obesity among children and adults.

Objective: Offering opportunities for being physically active not limiting them only to sports and organized recreation opportunities; offering to older people socialisation opportunities to tackle isolation.

Methods: The activity consists in a total of at least 30 minutes of moderate intensity activity, such as walking on most days of the week to gain health benefits. Seven walking groups (one for each district) have been activated in order to guarantee to people equal opportunities to have easy access to this activity and the groups are becoming more and more numerous.

Results: Starting from these premises, the city of Udine has increased efforts to involve people of all ages, but above all older people, in appropriate physical activity and to promote social inclusion and socialisation opportunities by tackling ageism (a belief that physical activity and sports are only for the young) and isolation (such as lack of support from others, including health professionals and recreation specialists).

Conclusions: The initiative has demonstrated that even modest increases in physical activity can make a big difference in the well being of older people and that active living contributes to individual physical and mental health and to social cohesion and community well being.

Keywords: Walking groups, physical activity, socialization opportunities, regular exercise, older people, moving around the city.

PREF37

PHYSICAL ACTIVITY ON PRESCRIPTION – A NATIONAL EVALUATION IN SWEDEN

Lena Kalings, Carina Edling

Swedish National Institute of Public Health, Östersund, Sweden

Background: Regular, moderate physical activity is known to prevent a number of diseases such as cardiovascular conditions, diabetes and depression. Little is yet known of the health impact on physical inactivity i.e. sedentary behaviour, which is a major public health, clinical and economic problem in modern societies.

Objective: This review summarizes the current research regarding health risks with sedentary behaviour.

Methods: A systematic literature review was performed in PubMed. Search terms used included sedentary behaviour, disease and mortality.

Results: This review showed that long sedentary time increases the risk for diseases from cardiovascular problems, diabetes and cancer. Some of the studies demonstrated that sedentary time was an independent risk factor for diseases and death, independent of the daily amount of physical activity performed. For example, one of the studies demonstrated that more than 4 hours of daily sedentary leisure time activity increased the risk for diseases. (The various studies found in this review will be presented in further detail during the presentation.)

Conclusions: There is a need for more research in the field of physical inactivity and sedentary behaviour. Health care professionals and public health workers need to address sedentary behaviour as an independent risk factor for diseases.

Keywords: Sedentary behaviour, diseases, mortality, physical activity.

PREF38

PHYSIOLOGICAL ASPECTS OF NORDIC WALKING

Aleš Jakubec, Pavel Stejskal, Iva Klimešová

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: Probably the most important effect of Nordic walking (NW) is an increase in exercise intensity, and therefore an increase in energy expenditure. However, subjectively perceived exertion during NW could be reduced. These effects are attributed to the involvement of the upper body musculature (the greater involvement of muscle mass).

Objective: The aim of our study was to evaluate exercise intensity (cardiovascular and metabolic load) during regular walking and during Nordic walking with regard to speed and elevation of ground. The ratio of perceived exertion was compared as well.

Methods: Ten men (age = 26.90 ±3.51 year, BMI = 23.96 ±2.22 kg × m^{-2}, VO_2max = 56.00 ±7.98 ml × kg^{-1} × min^{-1}) volunteered in the study. On different days each subject completed a graded exercise test until maximum and subsequently 24 randomly assigned trials of treadmill walking had been performed. There were twelve different combinations of speed (6.0; 6.6; 7.2 a 7.8 km × h^{-1}) and elevation of ground (0, 5 and 7.5%) for walking with poles and without poles as well. The duration of one trial was 15 minutes. Heart rate, oxygen consumption and ratio of perceived exertion were monitored.

Results: The average exercise intensity of all measured trials (regardless of the speed and slope) for normal walking was 46.4 ±13.7% of VO_2max and for Nordic walking 49.8 ±14.8% of VO_2max. This difference about 3.3% of VO_2max was statistically significant. The increase in energy expenditure during Nordic walking was accompanied by a slight statistically significant increase in the ration of perceived exertion about 0.3 point of Borg scale. However, perceived exertion related to exercise intensity (Borg scale divided by % of VO_2max) during Nordic walking showed a statistically significant decrease. This means that the same exercise intensity while Nordic walking was perceived as a less exhausting than walking without poles.

Conclusions: Using poles for walking of the same speed and elevation resulted in increase in energy expenditure. A slight increase in the ration of perceived exertion did not correspond with a greater increase in exercise intensity.

Keywords: Walking with poles, energy expenditure, exercise intensity, Borg scale.

ACKNOWLEDGMENT

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PREF39

PHYSICAL ACTIVITY ASSESSMENT IN PRE-SCHOOL CHILDREN IN AUSTRIA

Julia Kaufmann, Sylvia Titze

Institute of Sport Science, Graz, Austria

Background: Regular physical activity in children promotes health and fitness. The recent guidelines suggest that youth achieve substantial health benefits by doing moderate and vigorous intensity physical activity that adds up to 60 min. or more each day. In Austria, there is no current data on pre-school children's physical activity behavior.

Objective: The purpose of this pilot study was to investigate whether pre-school children accumulate enough steps to meet the physical activity guidelines of at least 60 minutes physical activity daily and to examine the correlation between pedometer and observation data.

Methods: The study took place in two kindergartens (Graz and surroundings) in April 2010. Data of 30 children – 14 girls and 16 boys with a mean age of 65.6 (SD = 9.7) months – were included. Physical activity was assessed for a period of seven days with a pedometer (Omron Walking Style Pro) combined with a physical activity diary, and direct observation during one day. Differences in the number of steps were analyzed between gender, weekdays, workdays and weekend using T-tests. Furthermore, the frequency and the length of physical activity bouts per hour derived from the observation were calculated.

Results: The children reached on average 11,432 (SD = 2718) steps per day. Only 20.7% of the children achieved the physical activity recommendation of at least 13,874 steps a day for all seven days based on Cardon and De Bourdeaudhuij (2007). More children (40.7%) achieved the recommended steps during the weekend. Only during the weekend boys accomplished statistically significantly more steps than girls (13,464, SD = 4,590 vs. 9,910, SD = 4,371). Data from the observation during 1–2 hours showed that children were sedentary for 87.4% of the observed time. This pilot study demonstrated that pedometer and direct observation are appropriate methods to assess physical activity behavior in pre-school aged children. Most of the children consistently wore the pedometer for seven days. They were able to put the pedometer on/take it off themselves and were proud of wearing these instruments.

Conclusions: From a health point of view most of those pre-school aged children were not optimally physically active. On the political, community and setting level it is important to provide space and opportunities for pre-school children to engage in physical activity.

Keywords: Physical activity, kindergarten, pre-school children, pedometer, direct observation.

PREF40

VARIABLES (MARKERS) IN THE LIFE CAREER OF PARTICIPANTS ENGAGED IN HIGH RISK ACTIVITIES (SKIING AND SNOWBOARDING): LIFE SPAN PERSPECTIVE

Jana Hoffmannová

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: The life span perspective and holistic approach to high risk activities can bring us a look into finding out a sense of potential risk – taking behavior in the context of the quality of life and individual living space of participants engaged in snowboarding and skiing.

Objective: The aim of the study is the answer to individuality and variety of life paths and to identify partial variables (markers) that are participants in the inclination to be present for high risk activities.

Methods: Three focus groups with semi-structured interviews and lifelines were used for data collecting. We analyzed the data through the qualitative software Atlas.ti.

Results: We don't have the transparent results yet, but the particular results show some important life events and life transitions that have determined the life career of these participants in high risk activities (snowboarding and skiing).

Keywords: Risk taking behavior, snowboarding, skiing, life career, focus group, life span, holistic approach.

PREF41

IS HEART RATE RECOVERY A CONSTANT VALUE IN REPEAT EXERCISE STRESS TESTS?

Itai Goldfarb, Kobi Serr, Robert Klempner, Ilan Hai, Linda Davrath, Ehud Schwammenthal, Shlomo Segev, Mickey Scheinowitz

Tel-Aviv University, Ramat-Aviv, Israel

Background: Previously it has been shown that a reduction in heart rate of less than 18 beats per minute during the first minute of recovery from a maximal exercise stress test is associated with a poor prognosis.

Objective: To investigate the changes in heart rate recovery (HRR) following repeated exercise stress tests in normal, apparently healthy individuals.

Methods: Subjects (n = 48; 9 females) with a mean age of 65 ±10 year, body weight 84 ±15 kg, and height 174 ±9 cm underwent standard exercise stress testing during routine checkups at the Institute for Medical Screening, Sheba Medical Center. Recovery heart rate was documented while the patients were in a sitting position at 1 minute of recovery from maximal exercise and categorized as "normal" >18 b/min.; "abnormal" <18 b/min.; "normal/abnormal" < >18 b/min., in which some of the tests had abnormal HRR and others a normal value of HRR. Each subject underwent an average of 5.2 ±1.4 tests within 17 years of follow up (1993 to 2010).

Results: The 48 subjects performed a total of 251 exercise stress tests. Peak heart rate (calculated as the difference between achieved and age predicted heart rate) was similar between groups: 114.4% ±5.3%, 105.9% ±6.6%, and 107.5% ±6.9% for normal, abnormal and normal/abnormal respectively. One hundred and fifty (of 251) exercise stress tests had normal HRR (34.4 ±6.5 b/min.), 10/251 had pathological HRR (12.3 ±3.0 b/min.), and 91/251 had normal/abnormal HRR (23.8 ±8.5 b/min.). In 36.2% of subjects, HRR alternated between normal to pathological value during repeat exercise stress tests. No differences in normal/abnormal HRR were detected between females and males: 25.6 ±8.7 b/min. vs. 23.4 ±8.4 b/min., respectively.

Conclusions: The data demonstrate that HRR is not a constant value, therefore precaution should be employed when interpreting exercise stress test results. The mechanism underlying such behavior and its clinical relevance deserves further investigation.

Keywords: Heart rate recovery, exercise stress test.

PREF42

WEIGHT LOSS PROGRAMS WITH AND WITHOUT A FAT BURNER

Iva Klimešová, Tomáš Brychta, Pavel Stejskal, Aleš Jakubec

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: Fat burners are popular because of their well known ease of use and potentially fast results in weight lost. The problem is that extracts used in fat burners may interact and have a harmful side effect on fat and glucose metabolism.

Objective: Our objective was to determine the effect of a 3 month weight reducing program with and without fat burners in overweight/obese pre-menopausal female subjects. The study focuses on changes in anthropometric and biochemical parameters.

Methods: A 3 month, double blind, randomized placebo – controlled study compared the effect of weight reducing program. Twenty two women were randomly assigned to a group using fat burners (FB, n = 11) and using a placebo (P, n = 11). The women involved in the FB group used a fat burner containing caffeine, chromium, carnitin, arginin, and extracts from citrus and salix. The control group received a placebo supplement. In addition, both groups followed a three month running intervention program which involved moderate-intensity aerobic exercise and a diet. Exercise (3 d/wk) involved treadmill walking. The diet was identical for both groups and the daily energy restriction for each participant was approximately 2,000 kJ.

Results: Average fat loss for the 22 women who completed the study was –4.33 ±2.31 kg (average weight loss was –4.37 ±2.50 kg). Both groups showed similar differences in monitored anthropometric variables (body weight, fat mass, visceral fat, waist circumference). Surprisingly our study shows a positive effect in the group on the placebo and a harmful effect on glucose metabolism in the group on fat burners. The median of fasting insulin changed by –1.90 mlU/l vs. 1.20 mlU/l, C – peptide by –0.10 nmol/l vs. 0.03 nmol/l, proinsulin by –0.97 pmol/l vs. 0.00 pmol/l, and HOMA index by –0.77 vs. 0.13 (FB vs. P). Changes in lipid metabolism (homocystein, total cholesterol, LDL cholesterol, triglycerides) were similar in both groups except for HDL cholesterol. The level of HDL cholesterol had better dynamics in the fat burner group than in the placebo group.

Conclusions: The weight reducing intervention with and without fat burners had a similar effect on the total fat mass and other anthropometric variables (body weight, visceral fat, waist circumference). Fat burner use had a harmful effect on glucose metabolism and insulin resistance.

Keywords: Weight loss diet, fat burners, exercise.

ACKNOWLEDGMENT

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PREF43

DIFFERENCES IN PA DURING RECESSES AT SCHOOL IN HIGH SCHOOL GIRLS AND BOYS

Petra Nováková-Lokvencová, Karel Frömel, František Chmelík

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: The school plays an important and irreplaceable role in providing physical activity (PA) to children. School regime has not been reacting effectively and flexibly to changes in the health status and lifestyle of students. At present, pupils and students, unfortunately, perform less physical activity during recesses at school.

Objective: The main aim of the study is to analyze the role of PA during recesses at school in the association to PA level in the school regime and to analyze differences between PA levels of girls and boys.

Methods: Czech high school students (137 girls, 64 boys; age = 15.8 ±0.5; BMI = 20.6 ±2.6) wore an accelerometer, ActiTrainer, for two hundred and one days. Students recorded additional information in their record sheets – times of putting on and taking off the device, times of arriving at school and leaving school times and duration of transport and also information on the type of PA and physical inactivity (PI). The data from the ActiTrainer device were processed in the specially developed software "ActiTrainer09".

Results: Boys spent more time in school recesses in moderate-vigorous PA ($F = 53.28$; $p = 0.000$; $\omega 2 = 0.20$) and in vigorous PA ($F = 26.85$; $p = 0.000$; $\omega 2 = 0.11$) than girls. Boys took more steps ($F = 8.38$; $p = 0.004$; $\omega 2 = 0.03$) and had higher energy expenditure in school recesses ($F = 36.68$; $p = 0.000$; $\omega 2 = 0.14$) than girls.

Conclusions: These data suggest that girls at high school are less active during the school recesses and in the whole school day than boys. Girls spent more time in school recesses in moderate PA than boys.

Keywords: ActiTrainer, school time, gender.

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PREF44

BECOMING A PROFESSIONAL DANCER

Tereza Vrbová

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: Dance can be a minor part of Physical Education classes, organized free time activity, a way of maintaining or improving health, a random activity, etc. dance reaches into the areas of sport, art, social life and others. Dance can also be a profession. This study was focused on Dance conservatory students.

Objective: The aim of the study was to find dance students' perceptions of their dance life and its implications. For example: What leads toward a dance career? How do these dancers to-be perceive the dance? What is their social life like?

Methods: A focus group interview was conducted with 6th grade students (n = 10, 9 females and 1 male) of a Dance conservatory. A non participant observation was used as an initial, supporting technique – one of its goal was to get some information about the school environment, another aim was to make the researcher familiar to the students before the interview itself. It took three weeks from the first visit of the school to the interview.

Results: The focus group as an instrument of qualitative research, following the direct observation, proved itself as an appropriate way of collecting data in this research area. The students were willing to talk about the subject and even expressed their pleasure in being a part of a dance topic research. The reasons for coming to the conservatory varied from "an art tradition in the family" to "I had to persuade my parents to let me do it". All the students clearly love dancing, however they can also see its weaknesses (health problems, job search difficulties, too strict weight control, etc.). Some of them were forced (by teachers, school policy) to change the direction of their future career, which they mostly quite struggle with. The students also realize the strong social ties dance creates among them.

Conclusions: The study showed that although the students can see the disadvantages of becoming a professional dancer, they enjoy dancing a lot and generally do not really want to consider another option.

Keywords: Dance, health, future career, school policy, attitudes, relationships.

PREF45

LEISURE TIME OF PERSONS WITH MENTAL DISABILITY LIVING IN RESIDENTIAL SOCIAL CARE HOMES

Hana Válková

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: The category of "leisure time" is included among basic characteristics of life style. Attention is not paid to persons with a mental disability. The intention of the presentation was to discover the issue: Does the category of "leisure time" exist for clients of residential facilities for the intellectually disabled and how do they spend it?

Objective: The aim of the presentation is to discover whether persons with mental disability in residential homes have access to leisure time and sports activity, chances for men–women and what is the content of leisure related to individual interests?

Methods: Participants living in residential homes with all over the year care were assessed (174 male, 92 female). The average age of residents was 21.3 (male), 20.4 (female), a moderate level of mental disability (between 40–60 IQ scale). Residents participated in three intervention programs for 18 months – arts, crafts, – sports, Special Olympics, – basically related to their curricula. Observation and recording of the formulated categories of daily activities with help of Chronographic method were done. Categories: daily living, controlled and special events and leisure time. In summary, active and passive leisure activities were defined. Data processing with descriptive statistics was done.

Results: In spite of the fact that the participants were living in residential centers with special care regimes, they spent about 6% of their leisure time in selected activity related to their interests and this was true for both male and female participants. They have equal chances to participate in different activities. The stimulation and motivation of their caregivers or educators resulted in equal chances. From the aspect of gender findings showed equal percentages of the participation of male – female in LT but higher percentages of female participants were shown in extra events. We can only speculate that female participants are more sociable and prefer to participate instead in their own activity? The type of intervention program (– arts, crafts, – sports, Special Olympics, – basically related to curricula) is linked with the content of leisure. Sports participants were less active in leisure (logically) as they are most active in sports. They showed less participation in other special events – again they participate more in sports competitions. An active life style with physical activities can influence their involvement in assisted jobs and self care.

Conclusions: Leisure time related to the self decision of residents was recorded. There is a tendency to spend one's time in passive activities, active leisure has to be externally supported. Gender differences were not found. The type of intervention program is linked with the content of leisure.

Keywords: Person with mental disability, active leisure time, intervention program, physical activity, Special Olympics.

ACKNOWLEDGMENT

The topic of the presentation was supported by research grant of GACR No 406/98/1087 Socialization of persons with mental retardation.

PREF 46

MONITORING AND COMPARISON OF PHYSICAL ACTIVITY IN CHILDREN LIVING IN CHILDREN'S HOMES WITH SCHOOL

Hana Bednářová, Jana Vašíčková

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: The research dealt with childrens' physical activities in the environment of children's homes with schools (CHHS). The children in our study were placed by the court into these institutions or their attached schools for protection or reeducation based on their previous socio-pathological behaviour.

Objective: The aim of our research was to compare weekly physical activity expressed by the number of steps and skips in children living in families and in children living in children's homes with attached schools. To do so we analyzed the index of their PA level (average daily number of steps).

Methods: We chose the pedometer Yamax Digi-Walker SW-200 for monitoring physical activity. It distinguishes a sufficient degree of validity and reliability (Le Maurier, Sidman, & Corbin, 2003). The gadget is not demanding for carrying and operating. Steps and skips are recorded on an electronic display. We used software IBM SPSS 18.0 (Chicago, IL, USA) for data analysis. For comparison of the average number of steps, we used the Mann-Whitney U-test for two independent sets and further we counted the effect size (Cohen's d) (American Psychological Association, 2002). The significance of differences for Mann-Whitney test was set at $p < 0.05$ and $p < 0.001$.

Results: The differences in the number of steps were most apparent on school days. The effect of this difference was large (Cohen's d). A middle size effect was detected in the difference in the average number of steps over the whole week. There was nearly no difference over the weekend in the average number of steps of common children and children from children's homes. Despite the fact that children live in children's homes, the average daily amount of walked steps overreached the recommendation for PA, which is 10,000 steps a day. We were also interested whether the average number of steps can be differentiated according to age. We compared two groups of children. One group of children was of primary school age (12–14 years old) (common population: n = 240 and CHHS: n = 45) and another group of children was 15–16 years old attending the first year of secondary school (15–16 year olds) (common population: n = 141 and CHHS: n = 58). An interesting finding is a higher average number of steps by the 12–14 year old children during weekend days.

Conclusions: The PA of children from CHHS is lower than children of the common population. What matters is the location of the school that is directly in the premises where children do not have to walk. School attendance is substituted for by leisure time PA.

Key words: Physical activities, pedometer, leisure time, children's homes with an attached school.

Section
Strategies, approaches and impacts of physical activity promotion

Oral presentations

PAPROM06

HEALTH-ENHANCING PHYSICAL ACTIVITY: CASE STUDY IN SLOVENIA

Andrea Backović Juričan

Institute of Public Health of the Republic of Slovenia, Ljubljanja, Slovenia

Background: This article presents background on a project named "National HEPA policy: Case studies from Europe" and especially results of that study in Slovenia. National policy documents, which directly or indirectly promote HEPA, are going to be presented along with the existing national HEPA intervention, which have an effect among different target groups.

Objective: The primary focus of this European HEPA case study is on physical activity (PA) documents issued by (mostly governmental) national bodies and their implementation. Slovenia is one of the five chosen countries that participated in this project.

Methods: For the purpose of this project there was a special Question and Answer (Q & A) template designed with 15 key criteria for successful HEPA policy implementation, based on previous analyses (Shilton, 2004; WHO, 2004; Bull et al., 2004; Cavill et al., 2006; Bellew et al., WHO, 2007a; 2007b; 2008; Daugbjerg et al., 2009). The structure of the template has three parts (questions about: context and institutional structure in the country; existing policies and their content; implementation). In each collaborating country several individual experts and important national and subnational institutes/organizations took part in completing the template.

Results: In Slovenia, 24 national (political) documents were identified, which have PA and HEPA elements from sectors such as health, education and sport, transport, environment and space, development and tourism. National laws that support HEPA were excluded from the case study, "Slovenian Health Enhancing physical Activity Strategy from 2007 till 2012", which represents the direct national HEPA policy and was additionally presented along with national documents from other sectors which also have a lot of PA elements. Many successful HEPA and sport programs and project with long term traditions, which have a great impact among different target groups and in various settings, were also identified. The "Program for primary prevention of cardiovascular diseases", which represents a unique national approach for the screening of risk factors and chronic disease prevention, was described in more detail.

Conclusions: Slovenia is one of the rare countries that even has a direct HEPA policy. It also has a lot of other national strategic documents that promote HEPA or PA in general. The national HEPA action plan is currently under preparation.

Keywords: Case study, HEPA, national policy documents, successful PA intervention, Slovenia.

ACKNOWLEDGMENT

I would like to thank several experts from various Slovenian ministries, faculties, sports organizations, health and other institutes as well as municipalities that collaborated in this national case study. Also many thanks to my colleagues from the HEPA European Steering Committee that invited me to be part of this European project.

PAPROM11

A COMMUNITY BASED CLUSTER RANDOMISED CONTROLLED TRIAL TO PROMOTE PHYSICAL ACTIVITY IN IRISH WOMEN

Aoife Lane, Niamh Murphy, Adrian Bauman[1]

Waterford Institute of Technology, Waterford, Ireland
[1] Behavioral Epidemiology and Health Promotion department, University of Sydney, Australia

Background: There remains a need to develop physical activity (PA) promoting strategies that can be delivered at a low cost, in real life settings, to "at risk" population sub groups. Using existing resources for PA to intervene in a community may enhance the generalisability and effectiveness of such efforts.

Objective: To use the community as both a setting and a resource in a cluster randomised controlled trial to promote PA among insufficiently active women 3 months after their participation in a mass 10k event.

Methods: Consenting participants (n = 402) were grouped into their respective Local Sports Partnership (LSP)/ geographical region. Matched pairs of these clusters (n = 32) were randomly allocated to the intervention (n = 193) or control group (n = 209). Participants in the LegIT intervention received a pack containing tailored information about how to be active in their community, training plans, stage matched booklets and a pedometer. Control participants received a placebo treatment. IPAQ PA data, self efficacy, social support, perceived environment, and process evaluation data were collected at both baseline and follow up terms. Analysis was conducted using SPSS 17 and outcome data were adjusted for a possible cluster effect.

Results: Recall of materials was higher ($p < .05$) in the intervention group although only 38% of the participants in the latter contacted existing resources in the community. Almost two thirds of the intervention group used the pedometers, 38% used local walking routes and 78% stated that the intervention increased their awareness of LSPs. Both groups reported an approximate 38 minute increase in PA and an increase in social support ($p < .05$), while an intervention effect was noted for time spent in vigorous intensity activity and the proportion categorised as sufficiently active at follow up ($p < .05$). Favourable changes in PA were noted for those living in rural areas and participants who did not have tertiary education while using any aspect of the intervention induced greatest changes in PA. A cost analysis of the intervention revealed that it cost 18 cents to induce a one minute change in PA per participant per week and 14 and 10 cent to obtain a similar change in rural and non tertiary educated participants.

Conclusions: Encouraging rates of recall, use of intervention components and increases in PA as well as successful cooperation and engagement with bodies responsible for the promotion of PA in Ireland is evidence for the transferability of intervention efforts in this trial.

Keywords: Community, physical activity, women, cluster randomised controlled trial.

ACKNOWLEDGMENT

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PAPROM17

INCREASING CYCLING IN SIX TOWNS IN ENGLAND: A COST-EFFECTIVE INVESTMENT

Nick Cavill, Lisa Muller, Cathy Mulhall, Karen Harold, Angela Kennedy, Adrian Bauman[1], Melvyn Hillsdon, Harry Rutter

University of Oxford, Oxford, United Kingdom
[1] Behavioral Epidemiology and Health Promotion department, University of Sydney, Australia

Background: A key local action to tackle climate change and improve public health is to increase cycling and walking for local journeys.

Objective: Cycling England's Cycling Demonstration Town (CDT) programme set out to explore how cycling could be increased in six towns in England.

Methods: We used measures including a new cycle infrastructure; cycle training; campaigns; and targeting key destinations such as workplaces and schools. Progress was measured in the first three years using data from two surveys of cycling in the CDTs: a secondary analysis of two waves of Sport England's Active People Survey (APS); and telephone surveys conducted in the CDTs in 2006 and 2009.

Results: APS data showed that between 2006 and 2008 there was an increase in cycling (for at least 30 minutes, once a month and three times a week) in local authorities with a CDT compared to local authorities without a CDT. This difference remained when local authorities with a CDT were matched to the demographic profile of local authorities without a CDT. Increases in cycling were also found in the telephone survey data and in objective monitoring using automatic and manual counts of cyclists. Economic analysis showed a benefit to cost ratio of at least 3 to one.

Conclusions: The results show that there appear to be indications that the CDT programme is having an initial impact, and is cost effective. A further wave of research will be conducted in 2010 to explore this further.

Keywords: Cycling, physical activity, intervention, surveys, economic analysis.

ACKNOWLEDGMENT

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PAPROM22

THE IMPORTANCE OF LOCAL KNOWLEDGE WITHIN PHYSICAL ACTIVITY PROMOTION

Naomi Ellis, Christopher Gidlow

Centre for Sport, Health and Exercise Research, Staffordshire University, Staffordshire, United Kingdom

Background: Population groups considered "priority" for physical activity promotion in the UK have changed little over time and include lower socio-economic groups and older people. Market segmentation is increasingly used to target such groups. Successful engagement may require a greater understanding of local issues, necessitating local data gathering from target groups.

Objective: To explore issues around physical activity participation specific to different population groups using analysis of qualitative data from focus groups and interviews with residents of a deprived community and older people.

Methods: Data presented were collected during 2008/2009 from two related research projects in the UK. Participants included adult residents of a deprived community (39.4 ±10.8 years old) and participants of exercise groups targeting older people (70.2 ±6.6 years old). Data were gathered through focus groups led by the same experienced moderator. All discussions were recorded, transcribed verbatim, and data analyzed using thematic analysis.

Results: Findings indicated that both groups had specific needs with regard to physical activity. Those from the deprived community felt that family oriented physical activity was important, with the majority of their barriers and motivators focussing on this aspect. The older adults were much more focused on the social element of physical activity, with a distinct preference for group based activity. Discussions with both groups indicated that the terminology used was likely to have an impact on their motivation to participate. Perceived benefits from physical activity participation were also specific to each of the groups. Those in the deprived population were much more likely to see the physical benefits of physical activity, whereas the older adults focused on the psychological (and social) impact. This type of message can be used to inform physical activity promotion within similarly segmented groups. Further, findings demonstrated the importance of identifying issues relevant to individual communities. The meaning of physical activity, perceived benefits and barriers highlighted were often pertinent to that community rather than their market segmented group.

Conclusions: Some issues are common to these population groups, but additional factors (locality and culture) must be considered. Qualitative data collection through focus groups can offer important insight in to local populations, enabling consideration of issues that market segmentation alone cannot.

Keywords: Physical activity, qualitative, older people, deprivation.

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Section
Strategies, approaches and impacts of physical activity promotion

Poster presentations

PAPROM01

HEALTHY BODY WEIGHT: FROM THEORY AND STRATEGY TO THE IMPLEMENTATION OF A NATIONWIDE PROGRAM IN SWITZERLAND – LESSONS LEARNT FROM THE FIELD

Ivo Schneider

Health Promotion, Bern, Switzerland

Background: Published every five years, Swiss Health Surveys in 1992, 1997 and 2002 showed a significant increase in overweight and obesity. Since 2006, Health Promotion Switzerland – a national foundation – has established different monitoring projects regarding physical activity, behavioral nutrition and body weight.

Objective: In 2006, Health Promotion Switzerland defined a clear strategy and goals: Decelerate the trend for increasing overweight prevalence among children and youth until 2010. Improve the number of people with healthy body weight until 2018.

Methods: In 2007, HPS has started its "cantonal programs for health body weight" focusing on projects with children and youth in Swiss federal states (cantons). The program consists of four levels: intervention level: children and youth; policy level: federal states; capacity building (communities, federal states, networks and organizations); public relations/communication. The programs are embedded in a national campaign, nationwide events and projects to mobilize the target groups and cooperation with alliances and networks.

Results: In 2007, cooperation started with seven cantons. In 2009, we cooperate with 22 out of 26 cantons. Based on our new state of the art report (published October 2010) and the evaluation report we are going to present our lessons learnt: from theory and strategy to implementation and evaluation – cases from the field; results from policy monitoring on the federal and state level; media monitoring; monitoring regarding behavioral nutrition, physical activity and body weight; overview of research centers and projects as well as players, networks and alliances; future outlook on making such programs sustainable.

Conclusions: To argue on the political field and to promote the implementation of longtime intervention are important. Policies such as the creation of healthy structures are effective. A nationwide organization must support the efforts in the field as a facilitator.

Keywords: Behavioral physical activity, Switzerland, national program.

PAPROM02

NATIONAL POLICY APPROACHES TO PROMOTE HEALTH ENHANCING PHYSICAL ACTIVITY (HEPA): CASE STUDIES FROM EUROPE

Karen Milton, Sonja Kahlmeier[1], Fiona Bull

Loughborough University, Leicestershire, United Kingdom
[1] University of Zürich, Zürich, Switzerland

Background: There is increasing interest in the development of national policy approaches to promoting HEPA. Although several papers focus on the content of physical activity policy, there is much to learn from the processes of development and implementation of HEPA policy as well as integration with policy developments in other sectors.

Objective: To develop and test a question and answer (Q & A) template for the collection of case study "stories" on the development, content and implementation of national policy supporting physical activity in a pilot set of European countries.

Methods: Based on the experiences of previous work and the Global strategy for diet, physical activity and health, a set of criteria were identified to reflect the key components of successful national policy approaches to HEPA. These criteria informed the structure and content of the Q & A template, which provides a standardised format to collect information within each country. The template is currently being piloted in five European countries. A project workshop was held (April 2010) to review progress and experiences and to identify improvements to the Q & A template.

Results: The Q & A template was completed by Finland, the Netherlands, Portugal, Slovenia and Switzerland. Each country took a different approach and experienced different levels of success in capturing the relevant breadth and depth of information. Feedback highlighted the need for further guidance on how to identify and engage relevant stakeholders and how to select relevant information for inclusion. Gaps were identified, including the need for more information on the political structures within a country to help understand the policy context. In addition, several questions were interpreted differently by the countries. Discussions led to the redrafting of these to provide greater clarity and consistency. Unexpectedly, the actual process of completing the template was reported to have been extremely beneficial to these countries as it helped capture, often for the first time, the breadth of current policies related to HEPA. Importantly, it helped identify links and discrepancies between policy documents. Moreover, participation provided an opportunity to bring together different government departments and organisations involved in HEPA policy or program development and implementation.

Conclusions: Overall, the revised Q & A template provides a useful tool for capturing national policy actions that support HEPA. Involvement in the project provided a catalyst for greater communication between sectors and could facilitate improved collaboration on future policy development and implementation.

Keywords: HEPA, policy, national approaches.

PAPROM03

EFFECTS OF COMBINED PROGRAMMES SWIMMING, AQUA AEROBIC AND AEROBIC FOR ELDERLY PEOPLE

Aldvin Torlaković, Izet Radjo, Sabahudin Dautbašić, Mujo Gec

Olympic Swimming Pool Center, Sarajevo, Bosna and Hercegovina

Background: The Administration of Sarajevo City has supported the Project of physical training for elderly citizens. All candidates were subject to carry out medical examinations serving as a basis for getting a proposal in regards to the scope and intensity of training. Testing had been conducted in order to establish the effects.

Objective: The objective of this research was to establish the effects of various programme activities upon the general state of each person.

Methods: Prior to the Project, all examinees had blood pressure within adequate limits as well as medical advice to join the moderate physical training. By random sample method, 30 persons of both sexes have been taken, 12 males (n = 12, mean age = 66.0 ±4.9 years; mean height = 1.77 ±0.17 m; mean weight = 91.9 ±24.5) and 18 female examinees (n = 18, mean age = 67.0 ±6.9 years; mean height = 1.63 ±0.12; mean weight = 67.3 ±9.5). The combined aqua aerobic and aerobic programmes were conducted within 12 weeks, twice a week for 60 minutes each. For the purpose of initial and final testing, the t-test was used for dependent samples (differences are significant at $p < .05000$).

Results: The "hand tapping" ($p = .0010$) and flexibility ($p = .0011$) tests show that the programme has provoked significant improvement of nervous-muscle construction and flexibility with a majority of the examinees, in spite of the relatively short period of time. Changes in some morphological variables are noticeable, waist measurements ($p = .0041$) and upper leg measurements ($p = .0014$). The programme has shown effects on waist measurements while inhaling and exhaling ($p = .0000$). Also, the exercise did not show any changes to blood pressure.

Conclusions: The results of testing show effective results when done upon elderly people. The programme itself might be useful for the animation of elderly people in order to change their attitude towards getting old and for them to have a healthy and active old age.

Keywords: Old age, swimming, aqua aerobics, aerobics.

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PAPROM05

PHYSICAL ACTIVITY INTERVENTION PROGRAM – EFFICIENCY, RECOMMENDATIONS

Michal Kudláček, Vlastimil Kudláček, Michaela Stodůlková

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: There is an increasing need to improve the physical activity level and a healthy lifestyle in children and youth.

Objective: The main aim of this project was to evaluate the effect/efficiency of the 8week physical activity intervention program and to support conditions for an active lifestyle in children and youth.

Methods: The combination of various intervention tools were the main ways of how to influence the physical activity of children/youth and their attitude towards physical activity and a healthy lifestyle. The main tools of our program were: 1. the intervention program, 2. pedometer + brochure, 3. power-point presentations, 4. body composition measurement, 5. sport preferences questionnaire, 6. IPAQ questionnaire, 7. test battery and 8. online system INDARES.

Results: The research sample was made up of 212 students. The effect was evaluated by body composition measurement (pre, post), the IPAQ questionnaire and the final evaluation questionnaire. The 8 week intervention program seems to be too short of a period of intervention for any significant changes of body composition to occur. A combination of various intervention tools was successful. The environment of the website and e-mail communication was also realized successfully and we can recommend it for further promotion activities.

Conclusions: Acquired results can contribute in making better physical activity programs. The combination of various promotion tools seems to be effective in the promotion of a healthy and active lifestyle of adolescents.

Keywords: Adolescence, physical activity, intervention, health promotion, obesity, overweight.

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PAPROM07

DOES THE RELATIONSHIP BETWEEN PARENTAL MODELING AND CHILD AND ADOLESCENT PHYSICAL ACTIVITY DEPEND ON AGE AND GENDER?

Anne Kerstin Reimers, Darko Jekauc, Filip Mess, Stefanie Everke-Buchanan, Alexander Woll

Faculty of Health Sciences, University of Bielefeld, Bielefeld, Germany

Background: Physical activity is important for children's and adolescents' health. Many different biological, morphological, psychological and genetic factors as well as the environment and social influences affect the physical activity behavior of children and adolescents. Social learning theory proposes that children learn by imitating the behavior of their social models.

Objective: The purpose of this study was to determine whether parental modeling of physical activity has a differential impact on children's and adolescents' physical activity both in and outside of sports clubs by age and by gender.

Methods: The motorik modul, as part of the German Health Interview and Examination Survey for Children and Adolescents (KiGGS), is a representative study for all of Germany on motor abilities and physical activity among children and adolescents. The sample includes 4,529 young people aged between 4 and 17. Physical activity was assessed by self report (4 to 10 years: parent report) using a questionnaire on the settings of school, club, leisure time sport and everyday activity (i.e. playing outside), which includes the duration, intensity and frequency of the children's activities. Participants were also asked if their parents are regularly physically active.

Results: Descriptive analyses have shown that boys participate in more club and leisure time sport than girls. The range of physical activity increases with age for both genders. Both the mother's physical activity (PAmother) [$F(1,23) = 8.54$, $p = .004$, $\eta 2 = .002$] as well as the father's physical activity (PAfather) [$F(1,23) = 19.34$, $p < .001$, $\eta 2 = .005$] are significant predictors for the club and leisure time physical activity of children and adolescents. The variance analysis points to significant interaction effects "PAmother * gender" [$F(1,23) = 4.15$, $p = .042$, $\eta 2 = .001$], "PAmother * age" [$F(2,23) = 4.89$, $p = .008$, $\eta 2 = .003$], "PAfather * age" [$F(2,23) = 7.05$, $p = .001$, $\eta 2 = .004$] and "gender * age" [$F(2,23) = 8.57$, $p < .001$, $\eta 2 = .005$]. The significance of the mother as a model for the physical activity of children and adolescents lessens with increasing age, and the mother is a more important model for girls than for boys. The significance of the father increases with age for girls and boys.

Conclusions: The results of this study can largely confirm the differential assumptions of social learning theory. Model learning among children and adolescents changes with age and is dependent on gender.

Keywords: Children, parents, physical activity, age, models, gender.

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PAPROM08

BEACH HANDBALL AND BEACH VOLLEYBALL AS MEANS FOR INCREASING ACTIVITY FOR RECREATIONAL SPORTSMEN

Jan Bělka, Karel Hůlka, Julie Chadimová

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: Beach sports have become a big attraction not only from the professional point of view but also as a leisure time activity. There are not many research projects done dealing with the work load in beach games. There are only a few dealing with heart rate monitoring in beach volleyball, football or handball.

Objective: The major goal is comparison of work load intensity of recreational beach volleyball and handball players, based on heart rate value analysis. Partial goals: to analyse work load intensity during a beach volleyball match. To analyse work load intensity during a beach handball match.

Methods: The sample consisted of males aged average 24.5 years, average height 181.9 cm and weight 80.4 kg. The average of the static heart rate was 56.4 beats/minute. The average heart rate max (HR) was 189.7 ±7.8 beats/minute. For the calculation of HR max a mathematical figure HRmax = 207 – (0.7 × age) was used. Players have participated on the same day in both beach volleyball and beach handball tournament. HR was monitored via Sport Tester Polar. The results were evaluated by Polar software. The data was statistically compiled with the use of arithmetic average and standard deviation.

Results: The players played three matches in beach volleyball on one set to 21 points (necessary difference of 2 points). One set lasted approx. 13.5 mins. After a break they went to play three matches in beach handball. The average HR during beach volleyball was 149.5 ±14.1 pulses/min. and 164.3 ±14.5 pulses/min. in beach handball. In both games they were in the low-intensity zone (60%–70% HR max) 24 ±20.9% resp. 22 ±17.5%, in low and middle load intensity (70–80% HR max) 27 ±13.3% resp. 14 ±13.2%, in middle and high load intensity (80–90% HR max) 36 ±18.3% resp. 25 ±11.9% and in high and maximal load intensity (90–100% HR max) 13 ±20.6% resp. 39 ±25.6% from the total time spent on the courts. In beach volleyball we also focused on players' intensity load differences 172 ±14.1 pulses/min. and goal keepers 156.5 ±16.6 pulses/min.

Conclusions: Load intensity of recreational players in the beach handball matches is higher than in beach volleyball matches. Both games can be recommended for increasing individual physical capacity. The motion in sand and nature has also beneficiary and healthy effects.

Keywords: Physical activity, beach volleyball, beach handball, heart rate.

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PAPROM09

RELATIONSHIP BETWEEN PARTICIPATION IN WORKPLACE STRETCHING PROGRAMS AND HEALTH INDICATORS ON WORKERS IN BRAZILIAN INDUSTRIES

Leandro Garcia, Thiago Sousa, Kelly Silva, Markus Nahas

Universidade Federal de Santa Catarina, Santa Catarina, Brazil

Background: The practice of physical activity (PA) in the workplace has a strong association with indicators related to health such as self perception of health and work ability. However, there is no information on a national basis about this relationship for workers in Brazilian industries.

Objective: To examine the relationship between participation in workplace stretching programs (WSP) and health indicators in male and female workers of Brazilian industries.

Methods: A cross sectional study conducted on a representative sample of industrial workers of 23 Brazilian states and the Federal District, selected in two stages. The data collection occurred between 2006 and 2008 by the means of a questionnaire. The dependent variables were the self perception of: health, stress, sadness/depression and fatigue after a working day, analyzed in relationship to participation in the WSP. The binary logistic regression adjusted by age, education, gross household income, geographic region and practice of PA in leisure time was employed for the data analysis.

Results: The sample comprised 33,161 men and 14,316 women (30.2%). Among men, 15.9% regularly participated in WSP, 8.9% participated sometimes and 75.2% did not participate. Percentages among women were 24.4%, 10.1%, and 65.4%, respectively. Positive self perception of health was associated with regular participation in WSP among men (89.0%, OR = 1.24, CI95%: 1.13–1.37) but not among women. Similar result occurred when evaluating the frequency of workers who reported never or rarely feel depressed (97.0%, OR = 1.34, CI95%: 1.11–1.61). However, regular participation in WSP was positively associated with lower levels of perceived stress among both men (90.5%, OR = 1.27, CI95%: 1.15–1.41) and women (84.3%, OR = 1.14, CI95%: 1.02–1.28). The same happened in the analysis of their disposition after a working day, with greater number of well disposed men (41.8%, OR = 1.31, CI95%: 1.23–1.40) and women (25.0%, OR = 1.21, CI95%: 1.09–1.34) in the group of workers who regularly participated in WSP. The participation in WSP in an inconstant way was not associated with any health indicator, in either of the gender.

Conclusions: Only the regular participation in WSP seems to be associated with better levels of health indicators and the strength of these associations is higher among men. Results support proposals for impact assessment of WSP on health of Brazilian workers.

Keywords: Workers, physical activity, health indicators.

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PAPROM10

INCREASING THE POPULATIONS' LEVEL OF PHYSICAL ACTIVITY (PA) THROUGH PRIMARY CARE IN THE CZECH REPUBLIC: GPS' KNOWLEDGE, ATTITUDE AND SELF REPORTED PRACTICE

Radim Šlachta, Radim Kristek

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: Exercise prescriptions through primary care are used in an attempt to initiate a physically active lifestyle in sedentary populations in many countries. It is believed that GP have a potential to increase population PA level. However, real results of such an activity can depend on their own knowledge and attitude.

Objective: The aim of this questionnaire survey was to determine the knowledge and attitude of Czech GP towards promoting regular physical activity and to assess a possible impact of GP on population PA level.

Methods: The internet web based questionnaire survey was mailed to 542 GPs in the Czech Republic. First and second mail reminders were sent to non responders two, respectively four weeks after the first announcement. A number of statements using four point type scales assessed the GPs' attitude. The score had no neutral points, forcing a choice of each statement. Knowledge was assessed by asking respondents to indicate whether evidence of benefit from regular physical activity existed for a list of conditions. For most of the listed conditions, solid evidence of positive effects exists.

Results: A response rate of 36.16% (196 responders) to questionnaires was obtained. The results suggest that the GPs have a generally good level of knowledge of the health benefits of regular physical activity. Some doubts regarding PA benefits (answers of "no evidence" or that they did not know) was revealed in questions asked about a reduction of the likelihood of falls in the elderly (49.5%) and a reduction in premature deaths (28.8%). The key data indicate the barriers which discourage GPs from being more active in PA promotion. It is shown that they don't believe that patients would accept their recommendation (strongly agreed or agreed 42.3%). As the second point, the most important barrier, the lack of time, was set (35%). Some GPs are not sure they have enough knowledge and information to promote optimal physical activity effectively (14.3%). This fact is also confirmed by their statements "any amount of physical activity is beneficial to health" (71.7%), or "only vigorous/strenuous activity is beneficial to health" (19.1%).

Conclusions: The majority of respondents are aware of the importance of PA promotion and their meaningful role in the process. This can be considered as a good starting point for the development of systems of PA promotion through primary care in the Czech Republic.

Keywords: Physical activity, health promotion, intervention, primary care, population approach.

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PAPROM12

PHYSICAL ACTIVITY CONSULTING AMONG SEDENTARY ADULTS

Liisamaria Kinnunen, Jyrki Komulainen

LIKES Research Center for Sport and Health Sciences, Helsinki, Finland

Background: Annually, insufficient physical activity is estimated to cost over 400 million Euro in Finland. A government funded Fit for Life program (KKI) promotes a physically active lifestyle among sedentary adults. One goal of KKI is to promote top-down development projects in communities to provide physical activity consulting involving several community departments.

Objective: A new type of communal physical activity consulting involves the cooperation of several authorities of civic organizations. Traditionally, physical activity consulting as a part of preventive health care has not been part of services provided by the social and health sector in Finland.

Methods: In 2007 in town of Lahti (population of 100,000), physical activity counseling was established in cooperation with the sport and health sectors. At the social and health department, clients with MBO syndrome, diabetes, arterial hypertension, and coronary diseases are able to receive a prescription for personal counseling. The civic sport department hired a physical activity counselor, who has access to certain client health data that help in counseling. The local authorities created also a free of charge, open physical activity counseling service. KKI allocated financial support to a total of 60,000 Euro for the project via the regional office of Finnish Sports Federation.

Results: In 2007, 150 clients and in 2008, 170 clients received physical activity prescriptions for personal counseling. In 2008 local civic services provided physical activity prescription clients four exercise groups for the gym. Also, some of the clients took part in local physical activities targeted at special groups. In 2007 open public physical activity counseling was used by 990 customers at a city library, swimming hall, and at a local shopping center. In addition, a private occupational health care company hired a physiotherapist for physical activity counseling. In 2008 public counseling was organized approximately once a month. In 2008 a total of 850 clients received physical activity counseling involving body composition measurement, blood sugar, and blood pressure tests. In the future the aim is to combine physical activity counseling with information offered at an open public health stall to provide even more developed counseling. The number of low threshold physical activity groups are increasing. Personal counseling via a given prescription as well as open public counseling have become a permanent civil service in Lahti.

Conclusions: A cross sectoral service chain including personal health enhancing physical activity counseling for the sedentary adult population should be a permanent function in communities. It is essential to commit health care professionals to promoting health enhancing physical activity as preventive health care.

Keywords: Health enhancing physical activity counseling, cross sectoral civic service chain, networking.

PAPROM13

GOOD PRACTICES OF SUPPORT APA IN THE REGION OF ZLÍN

Roman Herink, Martin Kudláček

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: Readiness of sport facilities for safe and comfortable participation by persons with physical disabilities in the region of Zlín is perceived as one of the crucial conditions for the development of adapted physical activities there. This presentation describes the current state in the region, as well as conditions and readiness for inclusion in physical activities.

Objective: This presentation highlights an example of the good practical involvement of local municipalities in the following areas: (a) a long term investment plan in relationship to accessibility, (b) systematic budgeting approaches, (c) the concept of the support of participation of persons with disabilities in sport in the region.

Methods: Analysis of related legislature; analysis of conditions of accessible transportation and financially reasonable opportunities; cooperation with regional government and local municipalities in the revitalizing and development of sport facilities; participation as a partner in strategic development documents in the region.

Results: First agreement with the city of Zlín about the support of life inhabitants with disabilities, the establishment of a Committee for people with disabilities; a project of revitalising one of the oldest urban settlements in Zlín, including a new multifunctional facility for sport and physical education; opening of the area called "Zelené" ("Green") in Zlín at a total cost of 70 mil. CZK; the project of a second ice rink in Zlín at a total cost of 105 mil. CZK; the first IPC Ice sledge hockey European Championship in Zlín's new arena – 6 countries; first house for scouting for youth with disabilities in the region of Zlín; the 2nd development event of IWAS & ICEWH for electric wheelchair hockey – 4 countries; Special Olympics – 3 countries; the start of cooperation within the project "Center of support of inclusion", Faculty of Physical Culture, Palacký University Olomouc in the region of Zlín.

Conclusions: The systematic participation of persons with disabilities in preparing the conditions for an active lifestyle gives examples of good practice. An inclusive approach to restoring and building sports facilities, leading to a high activity of the target group of people with disabilities.

Keywords: Inclusion, adapted physical activities, municipality, active life style.

PAPROM14

DEVELOPING A FRAMEWORK FOR THE RECRUITMENT OF PARTICIPANTS TO WALKING PROMOTION PROGRAMMES

Graham Brennan, C. Fitzsimons, C. Foster[1], A. Matthews, N. Mutrie

University of Strathclyde, Glasgow, Scotland, United Kingdom
[1] Department of Public Health, Oxford University, Oxford, United Kingdom

Background: While the effectiveness of physical activity intervention is well established, the reach/engagement of individuals to physical activity intervention remains challenging. An increased awareness of the complexity of this challenge, a lack of data to measure reach/engagement and the absence of a guiding framework underpin this piece of research.

Objective: To present key findings and preparatory work for the development of a framework for the recruitment of participants to walking promotion programmes. Once the framework is developed, the next step is to outline the evaluation processes that will test it.

Methods: We conducted a systematic search of electronic databases, web based databases and key walking promotion agency internet sites in May 2009. Studies published from the end of 2004 up to and including the search date were considered for inclusion. Focus groups and telephone interviews took place in Scotland and England between October 2009 and February 2010. We are conducting focus groups with participants between July–October 2010. The key findings from all three pieces of work will be combined to identify effective recruitment methods and develop a framework to guide research and practice.

Results: We retrieved 27,456 articles and 47 separate studies met the inclusion criteria for the systematic review. Underreporting of recruitment procedures and the flow of participants is widespread and restricts learning and cross study comparison. Although there is high reliance on single, passive methods, some comprehensive approaches have indicated that a complex but targeted strategy can engage more participants, including more challenging groups. Forty different walking groups were represented through the practitioner focus groups and interviews. Practitioner opinions indicate that the over-dependence on information alone is ineffective. Establishing interpersonal relationships is considered to be of high importance, especially with those most difficult to engage, and appears to bolster trust and uptake. Participants' perspectives will be gathered between July–October 2010. Participants' opinions and piloting will help to assess quality and ensure good practice.

Conclusions: A multi strategic systematic approach to recruitment is required. Triangulation of findings from the systematic review, practitioner focus groups and participant focus groups will be used to develop the framework. Comprehensive evaluation of this will take place in 2011.

Keywords: Recruit, physical activity, evaluation, framework, walk, evaluate.

ACKNOWLEDGMENT

All the walk leaders and walking group participants in Glasgow and surrounds who took part. Colleagues in the Universities of Oxford and Strathclyde. The Scottish Physical Activity Research Collaboration (SPARColl) NHS Health Scotland.

PAPROM15

BUILDING THE ECONOMIC CASE FOR WALKING: THE DEVELOPMENT OF THE HEALTH ECONOMIC ASSESSMENT TOOL FOR WALKING

Nick Cavill, Harry Rutter, Sonja Kahlmeier[1], Thomas Götschi[2], Pekka Oja[3], Francesca Racioppi[4]

Oxford University, Oxford, United Kingdom
[1] University of Zürich, Zürich, Switzerland
[2] Department of Preventive Medicine, University of Southern California, Los Angeles, USA
[3] UKK Institut, Tampere, Finland
[4] European Centre for Environment and Health, Rome, Italy

Background: Physical activity promotion is an important public health issue; a promising strategy is the promotion of walking and cycling for transport. Transport planners are critical partners in helping create supportive transport environments. Economic appraisals are an established practice for transport projects, but they rarely take health impacts into account.

Objective: The World Health Organization coordinated an international project to develop the Health Economic Assessment Tool (HEAT), which values the economic benefits from the reduced mortality due to specified levels of walking. This builds on a previous tool for cycling.

Methods: A systematic review of economic valuations of cycling or walking for transport was conducted. Epidemiological literature was reviewed to find risk estimates for the health impacts of walking. A HEAT model was developed for walking following a consensus meeting with international experts. This uses published relative risk data to estimate the impact on mortality of specified levels of walking.

Results: The HEAT for walking is a simple, transparent, robust and practice oriented tool. It is acknowledged that mortality is only one component of the health benefits, and that there are many potential areas for refinements to the tool. However, the HEAT tools for cycling and walking have been built on the best available evidence, while still meeting the needs of practitioners. The tools are primarily intended to be used in the comprehensive economic analyses of transport interventions or infrastructure projects, but they can also serve the evaluation of past, current or future levels of active transport. Since its informal presentation in autumn 2007 and its official launch in early 2009, the HEAT for Cycling has been used in Austria, the Czech Republic, France, Sweden, New Zealand, the United Kingdom (England, Scotland), and the United States. The US Centers for Disease Control and Prevention are currently adapting the tool for use in North America. The HEAT for walking builds on this experience.

Conclusions: The HEAT for walking is a practical, evidence-based model that transport planners and other professionals can use to conduct economic appraisals to make the case for active modes of transport.

Keywords: Walking, cycling, active transport, economics, cost benefit analysis.

ACKNOWLEDGMENT

This project has benefited from the input of a large number of people, notably the project core and advisory groups, and the attendees at the expert consensus meeting held in Oxford in 2010.

PAPROM16

A SYSTEMATIC APPROACH TO EXPLORING THE IMPACT OF SPORT IN PHYSICAL ACTIVITY PROMOTION IN SWITZERLAND

Miriam Wanner, Sonja Kahlmeier, Dorith Zimmermann-Sloutskis, Hanspeter Stamm, Christoph Nützi, Nadja Mahler, Urs Mäder, Brian W. Martin

Institute of Social and Preventive Medicine, University of Zürich, Zürich, Switzerland

Background: It is widely recognised that both moderate and vigorous intensity physical activity have several positive health effects. Current physical activity recommendations target both, representing a challenging potential for the sport community to contribute to health promotion. However, little is known about the role of structured sport in physical activity promotion.

Objective: The purpose is to present a systematic approach for identifying the role of structured sport (e.g. sport clubs) in the field of physical activity promotion in Switzerland.

Methods: Moderate and vigorous intensity physical activity is described in the Swiss Health Survey 2007. Sport club membership prevalence data are available from the Sport Survey 2008. The impact of sport club membership on physical activity behaviour in young adults has been analysed in the Swiss Household Panel. In the national programme Allez Hop offering structured sport activities, evidence for a potential population-level impact has been gathered. The national Youth + Sport programme has been analysed as part of a European project. International activities from the TAFISA and HEPA Europe working group "Sport Clubs for Health" have been reviewed.

Results: In 2007, 32% of Swiss adults adhered to the recommendations for three endurance-type training sessions, an additional 9% only to the recommendation of 30 minutes of moderate intensity activities on ≥ 5 days per week. One quarter of adults, 47% of adolescents and 62% of children are members in a sport club. The odds ratio of being physically inactive for sport club non-members compared to members was 4.6 (95% CI 3.5–6.0) in young men and 4.6 (3.3–6.4) in young women. The respective numbers for becoming inactive when leaving a sport club were 5.9 (3.4–10.5) and 5.1 (2.7–9.6). Outcome evaluation of Allez Hop failed methodologically, however on the population level in the main user group (middle aged women), the proportion not engaging in any sport decreased from 50.1% (1997) to 47.2% (2002) and to 43.1% (2007) ($p > 0.01$). The Youth + Sport programme reaches more than half a million children and youth each year. Internationally, the "Sport Clubs for Health" programme has developed guidelines in a participatory approach targeting stakeholders involved with sport club activities.

Conclusions: Structured sport activities and endurance-type exercise are of great importance in physical activity promotion in Switzerland. International experiences and activities will help to further develop the potential of the sport (club) community in Switzerland to contribute to physical activity promotion.

Keywords: Sport, physical activity promotion, national, sport club.

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PAPROM18

WHAT IS THE RISK REDUCTION FOR ALL-CAUSE MORTALITY FROM WALKING?

Paul Kelly, Nick Cavill, Sonja Kahlmeier[1], Charlie Foster

On behalf of HEAT core group
Oxford University, Oxford, United Kingdom
[1] University of Zürich, Zürich, Switzerland

Background: Walking is a safe and accessible activity that is known to confer many health benefits. There is much published literature on the specific risk reduction for all cause mortality through walking in different populations, though the published values vary substantially.

Objective: To review the epidemiological literature on the association between walking and all cause mortality and calculate an overall risk reduction. This will be used in the HEAT (Health Economic Assessment Tool) for walking, a model that estimates the economic value of walking interventions.

Methods: We conducted electronic literature searches on PubMed, using a number of key words. After constructing an initial list we contacted 12 international experts on walking epidemiology for recommendations of further studies. References of included studies were also searched.

Results: From 413 hits, 9 studies met our initial inclusion criteria. Using the data from these 9 studies we calculated an aggregated risk reduction of 0.78 (95% C.I. 0.64–0.98) weighted by sample size. This reduction corresponds to a net exposure to walking of 29 minutes, also weighted by sample size. The calculated value was reviewed and confirmed by an expert steering group. Our calculated risk reduction is similar to one found for a previous meta analysis. However, our value only uses studies that controlled for other forms of physical activity, therefore giving the independent effect of walking.

Conclusions: This value suggests that walking for approximately half an hour a day can lead to a significant reduction in risk for all cause mortality, and corresponds well to current international physical activity recommendations for moderate intensity activity.

Keywords: Walking, risk reduction, all cause mortality.

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HEAT core group. Natural England. World Health Organization Regional Office for Europe. Transport, Health and Environment Pan-European Programme (THE PEP). HEPA Europe.

PAPROM19

A SYSTEMATIC REVIEW OF ECONOMIC LITERATURE EVALUATING THE HEALTH BENEFITS OF WALKING

Clarke Dushy, Nick Cavill, Sonja Kahlmeier[1], Charlie Foster

Oxford University, Oxford, United Kingdom
[1]University of Zürich, Zürich, Switzerland

Background: Walking is a safe and accessible activity that is known to confer many health benefits. However, there is not a widely acknowledged or universal way to quantify these benefits.

Objective: We conducted a systematic review of published and grey literature in order to identify any studies which had economically evaluated the health benefits of walking.

Methods: We conducted a thorough systematic review, using over 250 search terms for the period 2006–2010, as a thorough review had previously been done by one of the authors (Cavill) prior to 2006. The databases searched were Econlit, Embase, Medline and PAIS International.

Results: Of the studies, 1,800 were originally found by means of literature review, of which 16 were printed in full in order to examine their methodologies and 2 were included in the review. A further 6 studies were deemed relevant from the grey literature searches, giving a total of 8 included studies.

Conclusions: Our review identified 4 different ways to quantify the health benefits of walking, that have been developed since 2006, but no universal method.

Keywords: Walking, economic evaluation, health economics.

PAPROM20

AN INCREASED NUMBER OF PHYSICALLY ACTIVE PROFESSIONAL SOLDIERS IN THE ISRAEL DEFENSE FORCE ARMY FOLLOWING 6 YEAR LIFE STYLE INTERVENTION STUDY

Mickey Scheinowitz, D. Ben-Dov, A. Moyal, N. Sharvit

Tel-Aviv University, Ramat-Aviv, Israel

Background: A sedentary life style is amongst the leading cause of morbidity and mortality in western society. Limited data have measured the effects of life style and physical activity intervention among professional soldiers.

Objective: To assess the differences in physical activity and life style intervention program before and after a 6-year follow up. We also tested the differences between combat and non combat professional soldiers.

Methods: A life style intervention program was implemented in the IDF in 2003 that included physical activity recommendations and healthy life style modification. A telephone survey was conducted of two representative groups of professional soldiers, combat (n = 374) and non combat (n = 536) soldiers, before and following 6 years of the intervention program. The survey included questions regarding physical activity habits, recreational activity, smoking and diet, and the data were compared between the combat and non combat soldiers.

Results: The incidence of physical activity was significantly increased among the non combat soldiers (from 60% to 66%) and from 73% to 85% among the combat soldiers; in both cases, for activity performed at least once a week. No differences were observed between groups for exercise performed at moderate to vigorous intensity (2.3 vs. 2.23 hours/week for non combat and combat, respectively) both at baseline and at 6 year follow up. Walking is a more frequent exercise among the non combat soldiers (35% versus 16%) while running is more frequent among the combat soldiers (87% versus 58%). Smoking was unchanged in non combat soldiers (25% and 24%) but was significantly reduced among combat soldiers (from 29% to 25%). Sixty five percent of non-combat and 58% of combat soldiers reported on maintaining a healthy diet and life style, while 39% and 27% (respectively) changed their life style due to the life style intervention program in the IDF.

Conclusions: The life style intervention program in the IDF army is effective in increasing the number of physically active soldiers and in reducing smoking among combat soldiers. Therefore such interventions are effective and may reduce the risk of health related physical inactivity.

Keywords: Professional soldiers, life style intervention study, physical activity promotion, Israel Defense Force (IDF).

PAPROM21

DOES PHYSICAL ACTIVITY PROMOTION REDUCE OR INCREASE THE NUMBER OF INJURIES? AN OVERVIEW OF THE LITERATURE

Eva Martin-Diener, Othmar Brügger, Brian Martin

Institute for Social and Preventive Medicine, University of Zürich, Zürich, Switzerland

Background: Regular physical activity is important for good health; on the other hand, injuries are a public health problem. Sometimes a causal link is established between rising levels of physical activity and increases in sports injuries – or it is stated that more physical activity will reduce injury numbers.

Objective: An overview of the literature was conducted focussing on the questions whether 1. overall, an active population will have more or less injuries than an inactive population, and 2. under which circumstances physical activity promotion as such can prevent injuries.

Methods: The Physical Activity Guidelines Advisory Committee Report (The Physical Activity Guidelines Advisory Committee. Washington, DC: U. S. Department of Health and Human Services, 2008) updating the evidence on the effects of physical activity on public health was the starting point. In further steps, reviews, single studies on specific topics and national reports were integrated. Finally, international experts from the U. S., the Netherlands and Finland were invited to comment. Then the literature overview was finalised.

Results: For old age, there is good evidence that participation in physical activity programmes can reduce the risk of falls from any cause; there is moderate to good evidence that higher levels of physical activity are associated with a reduced risk of osteoporotic fractures. Among adults at working age there is some consistent evidence that higher levels of physical activity are related to higher numbers of activity related injuries but there are some suggestions that activity related injuries could be more severe among those who are not active regularly; there are indications that higher levels of physical activity are not necessarily related to an increased risk of all cause injuries. In children and adolescents, there is consistent evidence that participation in sports or vigorous activity is strongly associated with an increased risk of sports related injuries and with an increased risk of injuries from all causes; there is limited evidence suggesting that non sports activities are not associated with injuries from all causes and that non-vigorous activities could be protective of fractures.

Conclusions: Despite its limitations, the current state of evidence will allow us to formulate our first recommendations for the practice of physical activity promotion and injury prevention in different age groups. More research is needed to quantify the relationship in different age groups.

Keywords: Physical activity, sport, injury, prevention, literature overview.

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PAPROM23

SOME METHODS OF TEACHING PHYSICAL CULTURE

Bakhitzhan Omarov

International Kazakh-Turkish University, Turkestan city, Kazakhstan

Background: The diversity of knowledge about objects and phenomena in a given area of activity can not be used if the knowledge they provide or they are not in order or if terms and their definitions do not correspond to modern volumes and values.

Objective: Theory and methodology of physical culture & sport represents an activity in which diversity is especially pronounced and presents us with the need to strive for the structural location of many sites of action: methods, principles, tools, exercises, etc.

Methods: The correct addressing of the issues of the classification and taxonomy of knowledge of the theory and methodology of physical culture & sport is of the utmost importance for the development of this discipline. Successfully compiled classification is convenient for the storage and retrieval of information, orientation in it, its use in practice, its use in programming, etc. But this is not its main feature. Good classification – a kind of compass for theoretical and practical activities and specialists on the theory and methodology of physical culture & sport.

Results: In this methodical manual, we deal with the basics of theoretical methods of physical education, the terminology classification system of physical exercises and their application in the activities corresponding to the modern requirements of physical culture. The subject of "Theory and methods of physical education" is the main carrier in terms of the academic training of physical education in special schools, as well as of mastering the content theory and methodology of physical culture & sport, providing the necessary theoretical basis for the development of the knowledge and skills of teaching sports and disciplines.

Conclusions: In turn, the successful study of the foundations of the theory and methodology of physical education requires knowledge of philosophical regularities, anatomy, psychology, physiology, education, sociology, questions of organization and management of physical culture and sports, etc.

Keywords: Methods, physical culture, regularities.

ACKNOWLEDGMENT

When writing a textbook the author relied on the principle of modern methods and the theory of physical education in the XXI century.

PAPROM 24

EVALUATION OF HEALTH-RELATED FITNESS AND INTRINSIC MOTIVATION THROUGH AN INTERVENTION PROGRAM IN FIFTH GRADE STUDENTS

Stella Rokka, Olga Kouli, Maria Michalopoulou

Democritus University of Thrace, Komotini, Greece

Background: The modern lifestyle and the absence of physical activity have produced high percentages of obesity among children and have led scientists to focus their interest on how to sustain or improve health related physical abilities during childhood. Unfortunately, today's unhealthy children are tomorrow's potential patients (Ignico & Mahon, 1995).

Objective: The present study aimed at evaluating dance aerobic programs for pupils aged 10 and 11, as a means to improve a) health related fitness and b) intrinsic motivation, examining, simultaneously, their correlations.

Methods: The sample was made up of 57 fifth grade students, 10 to 11 years old. Thirty three pupils composed the experimental group and the remaining twenty four the control group. The experimental group followed an aerobic dance program for twelve weeks, three times per week, with 45 minute sessions. The control group followed the normal Physical Education program of the school. The Prudential Fitnessgram test battery (Cooper Institute for Aerobics Research, 1992) was used for the evaluation of their physical condition. Both groups filled out the IMI questionnaire measuring intrinsic motivation (McAuley, Duncan, & Tammen, 1989), modified for the Greek population by Diggelidis and Papaioannou (1999).

Results: The internal cohesion of the questionnaire was satisfied (Cronbach's α: .68 to .90). The One-Way Anova analysis revealed that two groups had no statistical differences at the beginning of the study. The Anova Repeated measures analysis was applied for each physical ability, as much as for the "enjoyment" and "effort" variables. The analysis model (2X2) included the variable "measurement" (initial – final) as the repetition variable and the variable "group" (experimental – control) as the independent variable. The results of the Anova repeated measures analysis showed that there was a statistically significant interaction between the variable "measurement" and "group" for the improvement of physical abilities (abdominal muscle endurance, trunk flexibility, strength of the hands, flexibility of the posterior femoral muscles, cardio respiratory endurance), enjoyment and effort. Moreover, after the dance aerobic intervention program, there was a statistically important correlation among the factors of their intrinsic motivation and the physical abilities of the pupils in the experimental group, which was not true in the initial measurement.

Conclusions: The application of a dance aerobic program is easy for physical educators to design and enjoyable for students. Also, such programs are imperative due to our modern way of living, which is characterized by the absence of any kinetic activity.

Keywords: Dance aerobics, Fitnessgram, elementary school children.

PAPROM25

MOTIVES OF STUDENTS FOR FOLLOWING SPORTING EVENTS

Nijaz Skender, Naim Ćeleš, Blaž Jereb[1], Stojan Burnik[1], Primož Pori[1], Maja Pori[1]

Faculty of Pedagogy, Democritus University of Bihać, Bosnia and Hercegovina
[1] Faculty of Sport, University of Ljubljana, Ljubljana, Slovenia

Background: The sporting event spectators represent an important part of sport. They could have impact on entire organization and purpose of sport competitions, so a good knowledge of spectators' values and interests is important for organizational culture of sport.

Objective: The aim of the study was to investigate the motives of spectators of sporting events.

Methods: The study was based on a survey of 85 students (average age = 22.1 ±2.93) of Faculty of Pedagogy (Department of Sport) in Bosnia and Hercegovina. The subjects were asked the question of importance of 24 individual motives for following sporting events. On a scale from 1 to 5 the respondents in terms of importance ranked the proposed motives (1 – completely unimportant motive, 5 – completely important motive). The average values were computed for each motive and the rankings of proposed motives was brought up.

Results: The most important motives for following sporting events were "Pleasure" (4.53), "One's liking for sport" (4.48) and "Entertainment" (4.43) and could be classified in the category of Dionysian values. The least important motive was "Nothing else to do".

Conclusions: The results show that the role of sport in a spectator's life is much more considered a source of relaxation. Sports play is taken in as entertainment, pleasure and enjoyment.

Keywords: Spectators of sporting events, motives, students, BIH.

Section
Technology in physical activity and health

Oral presentations

TECHPA01

SENSECAM: WHAT CAN THIS NEW TECHNOLOGY TELL US ABOUT OUR JOURNEYS? RESULTS FROM A PILOT STUDY

Paul Kelly, Charlie Foster

Department of Public Health, Oxford University, Oxford, United Kingdom

Background: Active travel such as walking and cycling is known to have potential in increasing physical activity levels in sedentary individuals. There have been recent calls for technology that will improve our ability to measure as well as our understanding of active travel behaviour.

Objective: The purpose of this study is to investigate the potential efficacy of a new device, SenseCam, in travel behaviour surveillance and research.

Methods: Participants (n = 20) were required to wear the SenseCam device for one full day of travel. The device passively records approximately 2000 time stamped images during a day. Participants also completed a self report travel diary for the same period. Limit of agreement (Bland-Altmann) plots were used to assess the level of verification between the two measures.

Results: The new SenseCam device recorded more journeys than the travel diary. In this pilot, self reported journey duration was over-reported by almost 4 minutes per journey. The magnitude of over estimation appears to be a function of both responder and journey mode, with cycling over reported by more than walking and car travel. The device also provided visual data that was used for directed interviews about destinations, travel environments and choice of routes.

Conclusions: This new technology shows considerable potential in the field of travel research and may offer the chance to deepen our understanding of travel behaviour.

Keywords: Active travel, measurement, digital imagery, validation, feasibility, pilot.

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We would like to thank the Sensors and Devices Group at Microsoft Research Cambridge, the Clarity Group from DCU and Vicon.

TECHPA02

USING NEW TECHNOLOGIES TO IMPROVE OUR UNDERSTANDING OF PHYSICAL ACTIVITY

Charlie Foster, Aiden Doherty, Paul Kelly

Department of Public Health, Oxford University, Oxford, United Kingdom

Background: New technologies can individually, and in combination, add to our measurement and understanding of physical activity. The application of new technologies to assess behaviour is developing rapidly. New technologies include accelerometers, Global Positioning Systems (GPS), digital image systems, Bluetooth, heart rate/physiological sensors, Web 2 and advanced computational analysis.

Objective: The aim of our study was to systematically review (I) what types of information does each technology offer and (II) when used in combination, what are the best applications and future opportunities for these new technologies?

Methods: We used standard systematic review methods to identify studies from published or grey literature. Studies were included in the review if they had reported using new technologies to measure physical activity and/or physical activity social, environmental and individual correlates. We examined the strengths and limitations of each technology alone and in combination (e.g. accelerometer and GPS).

Results: We identified ten studies that reported using a combination of technologies to measure both physical activity behaviour and environmental correlates. The majority reporting combined used of accelerometer and GPS. No single source of information from one technology could successfully answer who, what, where, when and why questions related to physical activity. Other promising technologies included digital capture systems, e.g. "lifelog" images, Web 2 assessment systems and Bluetooth. Studies appeared to be limited by design sample size, the cost of technologies and limitations in computer analysis approaches. New technologies can offer more detail about physical activity behaviour.

Conclusions: New technologies offer researchers both opportunities and challenges. The integration of different technologies onto common platforms is needed to reduce the burden on participants and researchers. Intelligent software processing techniques, such as pattern classification and machine learning algorithms, offer additional help to future research.

Keywords: Technology, physical activity, measure, correlates.

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TECHPA04

A COMPARISON OF TWO STEP-BASED TECHNIQUES: THE ASSESSMENT OF THE FREE LIVING PHYSICAL ACTIVITY OF ADOLESCENTS

Roman Cuberek, Karel Frömel, Krzystof Skalik[1]

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic
[1] Academy of Physical Education, Katowice, Poland

Background: A common limitation of studies focused on physical activity (or inactivity) is the insufficiency of the validity of techniques assessing physical activity under free living conditions. Published studies comparing two or more similar techniques usually analyze output differences but rarely analyze the effects as related to physical activity (PA).

Objective: The aim of the study is to assess the accuracy of two motion sensors (the Yamax pedometer and ActiGraph accelerometer) which operate on different principles when the amount of free living PA is measured (in number of steps).

Methods: Four high schools in the Katowice region of Poland were selected to implement the study. A sample of 149 females (mean age = 18.0 years) concurrently wore two motion sensors (the Yamax Digi walker pedometer and ActiGraph GT1M accelerometer) over one week in October, 2008. We used three sets of information for the analysis: daily step count achieved within the whole week, within the weekdays, and within the weekend. For each of the two devices, participants were grouped into five step-based categories of PA, in accordance with published threshold guidelines (categories: sedentary, low active, somewhat active, active, and highly active).

Results: In the total 7 day period of monitoring, depending on the motion sensor, the participants accumulated (median) 8,874 (IRQ = 6,695–10,777) steps per day (accelerometer), and 8,489 (IRQ = 6,647–11,120) steps per day (pedometer). Recorded inter-device differences (steps per day) were significant only on Wednesday ($p = 0.025$) and Sunday ($p = 0.036$), and there were no inter device differences on workdays, weekend and during the whole week period. The correlations between the two devices were positive, moderately or lightly high correlated (rsp range from 0.65 to 0.74), and significant ($p < 0.001$). There was moderate disparity in classification of physical activity (step counts) recorded by each of devices for the same females (range: in 40–57% of participants). In one category, there were inter device differences in the readings of 38% of participants. In more than on category (across the whole week) there were inter device differences in the measurements of 10% of the participants.

Conclusions: The comparison of the Yamax pedometer and the ActiGraph accelerometer showed some significant differences (depending on the day). The findings suggest that the likelihood of "erroneous" categorization of physical activity (generated by motion sensors) for the same participant was significant.

Keywords: Pedometer, accelerometer, physical education evaluation, step counter, adolescent, measurement.

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TECHPA08

DEVELOPING GIS-BASED MEASUREMENTS OF NEIGHBOURHOOD WALKABILITY FOR ASSESSING THE PHYSICAL ACTIVITY IMPACT OF INTERVENTIONS IN THE BUILT ENVIRONMENT: INSIGHTS FROM THE PARC PROJECT

Ellis Geraint, Karen Keaveney, Michael Donnelly

Queens University, Belfast, United Kingdom

Background: This paper reports the emerging findings from one aspect of the Physical Activity in the Regeneration of Connswater (PARC) which is evaluating the physical activity impacts of a major new community greenway in deprived neighbourhoods of East Belfast in Northern Ireland.

Objective: The aim is to report on the methodological challenges and potential of spatial analysis using GIS for evaluating the impact of specific built environment projects on the walkability of surrounding areas and its integration into spatial planning decisions.

Methods: Development of a GIS based walkability index supported by extensive data on the physical activity of the local population, which is then used to model the potential impact of a proposed community greenway.

Results: The use of a GIS based walkability index in this context is shown to be novel in a number of respects – first is that it reports a rare application of this methodology in the context of European urban forms; it is accompanied by a detailed physical activity survey of the local population that allows user-interfaces with the built environment to be verified; and that it is developed to specifically evaluate the impact of new infrastructure, rather than the assess existing urban form.

Conclusions: The paper describes the methodological challenges and opportunities for the development of a Walkability Assessment tool that can be used for decision-support in spatial planning.

Keywords: Walkability index, GIS, physical activity, urban form.

ACKNOWLEDGMENT

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Section
Technology in physical activity and health

Poster presentations

TECHPA05

IDENTIFICATION OF SUITABLE SITES FOR SMALL RECREATIONAL AREA: EXAMPLE FROM THE OLOMOUC MUNICIPALITY

Jan Dygrýn, Josef Mitáš, Karel Frömel

Faculty of Physical Culture, Palacký University, Olomouc, Czech Republic

Background: A geographic information system allows the collection of demographic and environmental data available from municipality and cadastral plans. It can be used for the evaluation of the suitability of sites for recreational areas, including the demographic structure of an area, its distance from existing recreational areas and environmental characteristics such as being a floodplain or landowner.

Objective: The aim of this study is to identify suitable locations for new recreational areas based on specific criteria and to create a spatial database of existing recreational areas in the Olomouc municipality.

Methods: The software ArcGIS 9.3 has been used to determine suitable locations in a static model. The model was made up of several layers, and their importance was determined by the weighting principle. The ArcGIS 9.3 Data model "COST GRID" was developed by means of the ArcGIS 9.3 system and this became the Left off here knowledgebase, for further analysis, of this study.

Results: The result of the study was the creation of three variants of proposals for suitable sites for small recreational areas. Each variant represents a different degree of the importance of input layers. For each of the three variants five suitable sites for new recreation areas were selected. Although all three variants have different degrees of the importance of input layers, five locations out of fifteen have been identified twice. No location was represented in all three variants. The results of this study are presented as a set of raster maps of the city of Olomouc.

Conclusions: The study identifies the existing coverage of the recreational needs of residents, and establishes recommendations for improvement. The analysis shows that the situation is not optimal for all districts, especially considering the lack of coverage in the central parts of the city.

Keywords: GIS, spatial analysis, playground, walkable distance, children.

ACKNOWLEDGMENT

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TECHPA06

THE ANALYSIS OF EVOKED POTENTIAL IN CHILDREN WITH DEVELOPMENTAL COORDINATION DISORDER: PILOT STUDY

Ladislav Čepička, Pavel Mautner, Irena Holečková, Roman Mouček

University of West Bohemia in Plzeň, Plzeň, Czech Republic

Background: Developmental disorders in the area of coordination can influence the mind and social position of children in a negative way. Electrophysiological methods, such as those regarding visual, auditory and cognitive evoked potentials, specifically the waves MMN and P300, can be used to investigate these disorders.

Objective: The aim of this study is to examine the usage of evoked potential in children whih developmental coordination disorder.

Methods: In children with coordination disorders, all domains related to the disorders have been investigated by medical doctors. The relationship between motor activity and brain response has been analysed consequently. The sophisticated device called BRAINAMP, which is designed to measure bio signals (EEG/ERP/EMG) has been used. The evoked potentials record has been interpreted by medical doctors again after all other methods have been applied.

Results: The occurrence of positive waves with latency of about 300 ms result from the analysis of the response while running to stimuli S1 and S2. Negative waves with a latency of about 150 ms prevented the occurrence of a positive wave and this wave was perceptible after the subtraction of the time of the reaction to stimuli S1 from time of reaction on stimuli S2. This component has relatively small amplitude, which can be caused by a small number of measured children. The component P3 with a latency of about 600 ms was identified.

Conclusions: The using of evoked potential to identify children with developmental coordination disorder was examined. The results are very hopeful, but the examination of a larger sample of children is needed.

Keywords: Developmental coordination disorder, evoked potential.

ACKNOWLEDGMENT

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TECHPA07

A PROPRIOCEPTIVE PROGRAM IS USEFUL FOR IMPROVING BALANCE AND HEALTH-RELATED QUALITY OF LIFE

Narcis Gusi, Hector A. Corzo, Jose A. Parraca, Jose C. Adsuar, Pedro R. Olivares, Borja Del Pozo-Cruz

Faculty of Sport Sciences, University of Extremadura, Cáceres, Spain

Background: Frail, high-risk persons living in institutions tend to have a higher incidence of falls caused by balance disorders or weakness. Gait and balance impairments are both the most important immediate causes and the most serious risk factors for falls in the nursing home.

Objective: An individual proprioceptive exercise program with the Biodex Balance System (BBS) reduces the fear of falling and improves the balance and Health Related Quality of Life (HRQoL) in elderly institutionalized persons.

Methods: The sample consisted of 40 institutionalized elderly with a fear of falling (FES-I > 23), randomized into a control group (n = 20) and an experimental group (n = 20). The control group received the normal care service of the nursing home and the experimental group received the same care services and an individual proprioceptive exercise program with BBS. The following measures were evaluated at both the baseline date and after three months: Their fear of falling was evaluated with FES-I, their dynamic balance was measured with BBS (fall risk test, level 8) and also with HRQoL with EQ-5D.

Results: A proprioceptive training session reduced by 20% the fear of falling of this population ($p < .001$), increasing the dynamic balance by 50% ($p < .001$) and the quality of life by 10% ($p < .05$) of the institutionalized elderly. A greater or lesser decrease in their fear of falling depended on their baseline level of balance and strength as well as the improvements achieved in the balance level after treatment.

Conclusions: This novel protocol training is suitable for the institutionalized with a fear of falling population and opens to us a new possibility for the application of this kind of platform to the treatment of the fear of falling and the prevention of falling and falls.

Keywords: Fear of falling, dynamic balance, proprioceptive training, institutionalized elderly.

AUTHOR GUIDELINES

FOCUS AND SCOPE

The journal "Acta Universitatis Palackianae Olomucensis. Gymnica" focuses on presenting results of research studies and theoretical studies from the field of kinanthropology. The scope of the journal covers topics related to biomechanics, exercise physiology, physiotherapy, somatometry, sports psychology, sports training, physical education, public health, etc. The journal also welcomes submissions that present results of interdisciplinary research.

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The main language of the journal is English. Article title, abstract, and keywords are published also in Czech. All texts submitted to the journal are accepted only in English. Czech speaking authors are required to provide article metadata both in English and Czech. In Non-Czech speaking authors, the Czech version of article metadata will be completed by the journal.

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The submission file is in Microsoft Word (.doc) document file format. The text is single-spaced, left justified, uses 12-point Times New Roman font, and all illustrations, figures, and tables are placed at separate pages, rather than within the text. The maximum length of a submission allowed is 15 pages in total.

Abstract and Keywords

The recommended length of an abstract is 300 words and it should not exceed 400 words. Where applicable, the abstract will be structured in following sections: BACKGROUND, OBJECTIVE, METHODS, RESULTS (including relevant statistics), and CONCLUSIONS. Authors are required to provide 3 to 10 keywords (not used in the title).

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Typical article is structured as follows: INTRODUCTION, METHODS, RESULTS, DISCUSSION, CONCLUSIONS and REFERENCES. The titles of the chapters are capitalized and left justified.

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References

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We look forward to our further cooperation!

Doc. MUDr. Pavel Stejskal, CSc., Editor in Chief
Doc. PhDr. Vlastimila Karásková, CSc., Managing Editor

Telephone: +420 585 636 357
E-mail: aupo@upol.cz

POKYNY PRO PŘÍPRAVU RUKOPISU

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Časopis „Acta Universitatis Palackianae Olomucensis. Gymnica" je zaměřen na publikaci výsledků výzkumných a teoretických studií z oblasti kinantropologie. Zaměření časopisu pokrývá témata související s biomechanikou, zátěžovou fyziologií, fyzioterapií, somatometrií, sportovní psychologií, sportovním tréninkem, tělesnou výchovou, veřejným zdravotnictvím atd. Redakce časopisu také vítá příspěvky, které prezentují výsledky interdisciplinárního výzkumu.

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Doc. MUDr. Pavel Stejskal, CSc., vědecký editor
Doc. PhDr. Vlastimila Karásková, CSc., výkonný editor

Telefon: +420 585 636 357
E-mail: aupo@upol.cz

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