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Oct 17th, 1:45 PM - 3:00 PM

Indares.com As an Instrument for Research and Educational Support

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Recommended Citation

Vorlicek, Michal; Rubin, Lukas; Fical, Pavel; Kren, Filip; Mitas, Josef; and Stelzer, Jiri, "Indares.com As an Instrument for Research and Educational Support" (2014). *Georgia Educational Research Association Conference*. 12.
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Presenter Information

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INDARES.COM AS AN INSTRUMENT FOR RESEARCH AND EDUCATIONAL SUPPORT

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Keywords: health, physical activity, physical fitness, on-line, database

INTRODUCTION

Contemporary education and research uses information and communication technology on a large scale (Zhu, 2008). The market offers a number of various applications and servers that support physical activity (e.g. Endomondo, Sports Tracker). However, these applications cannot be used for research purposes or education in schools. The Indares system (<http://www.indares.com>) is a purposefully developed on-line server that supports research and education in the area of physical activity.

OBJECTIVE

The objective of the paper is to present the internet-based Indares system aimed at research and educational applications.

INDARES SYSTEM

The on-line Indares project (International Database for Research and Educational Support) is a comprehensive system aimed at recording, analysing and comparing physical activity of the system users. The system is developed in cooperation with the Center for Kinanthropology Research, Faculty of Physical Culture, Olomouc, Czech Republic (Indares, 2014). The purpose of this internet-based project is to support education and research in the area of physical activity. Other aims are to increase the awareness of the system users about the issue of physical activity and to provide means to improve their lifestyle. The results of a study by Chmelík et al. (2008) imply that the Indares system is a suitable tool for on-line collection of data on physical activity, which could then be used for research purposes and

future development of internet-based intervention programmes (Indares, 2014). The system is easily accessible to all users and is provided free of charge. The total number of registered users as of 1st April 2014 was 28,484 (Fig. 1 and 2) (Rubín et al., 2014).

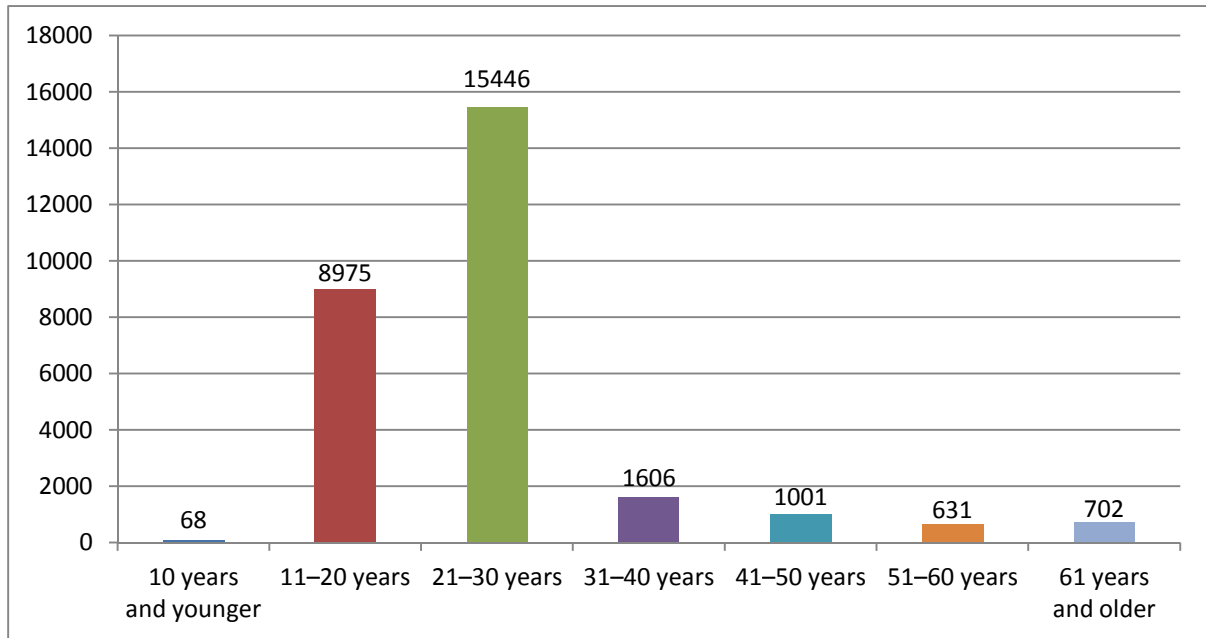


Figure 1. Numbers of registered Indares users by age. *Source:* Indares (2014).

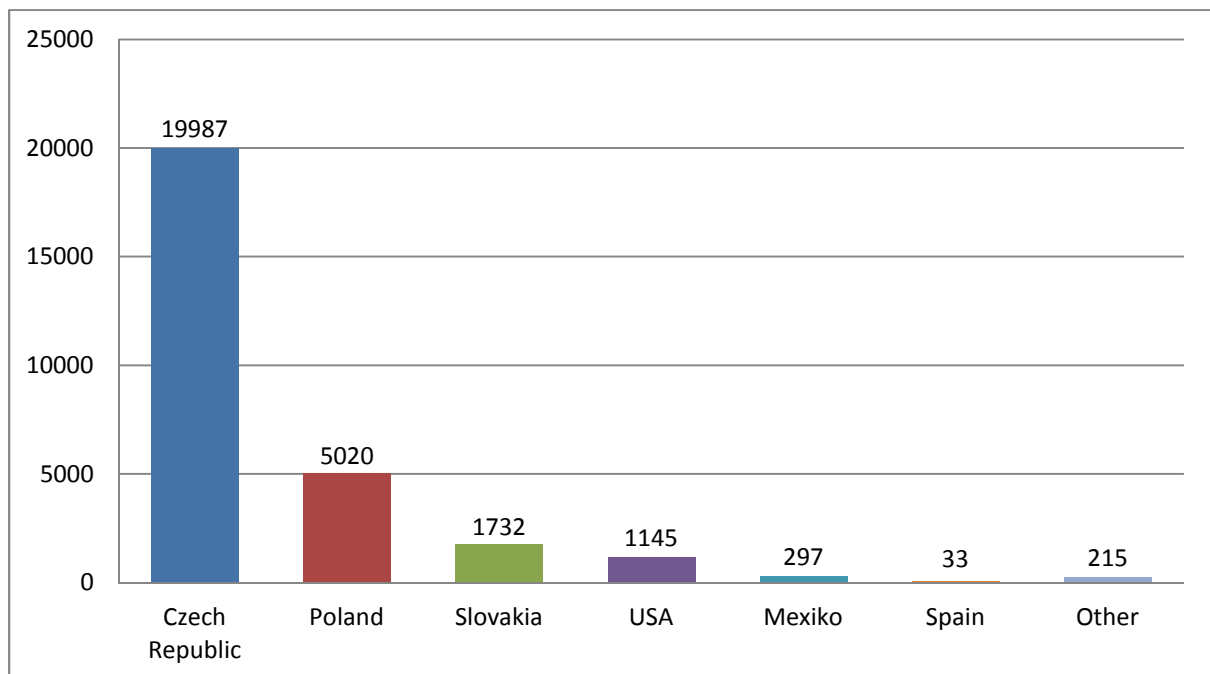


Figure 2. Numbers of registered Indares users by nationality. *Source:* Indares (2014).

The summary graph in Figure 2 indicates a significant prevalence of users from the Czech Republic (n = 19,987). This is over 70% of all users. A logical explanation is that the

Indares system is developed and primarily promoted in the Czech Republic. In other countries promotion is ensured through research projects by partner universities (Akademia Wychowania Fizycznego w Katowicach, Komenský University, Bratislava, Valdosta State University) that cooperate with Palacky University, Olomouc.

MODULES

The Indares system includes a total of five independent modules in six language versions. Below are presented the possibilities of their educational and research applications.

PHYSICAL ACTIVITY

In this module the system users can record the duration and type of physical activity on a daily basis. The software calculates approximate energy expenditure and records the data into graphs or tables. The values are then confronted with physical activity recommendations.

Each user thus has an overview of the physiological nature of various types of physical activity and immediate feedback indicates to what degree relevant recommendations are met (Fig. 3).

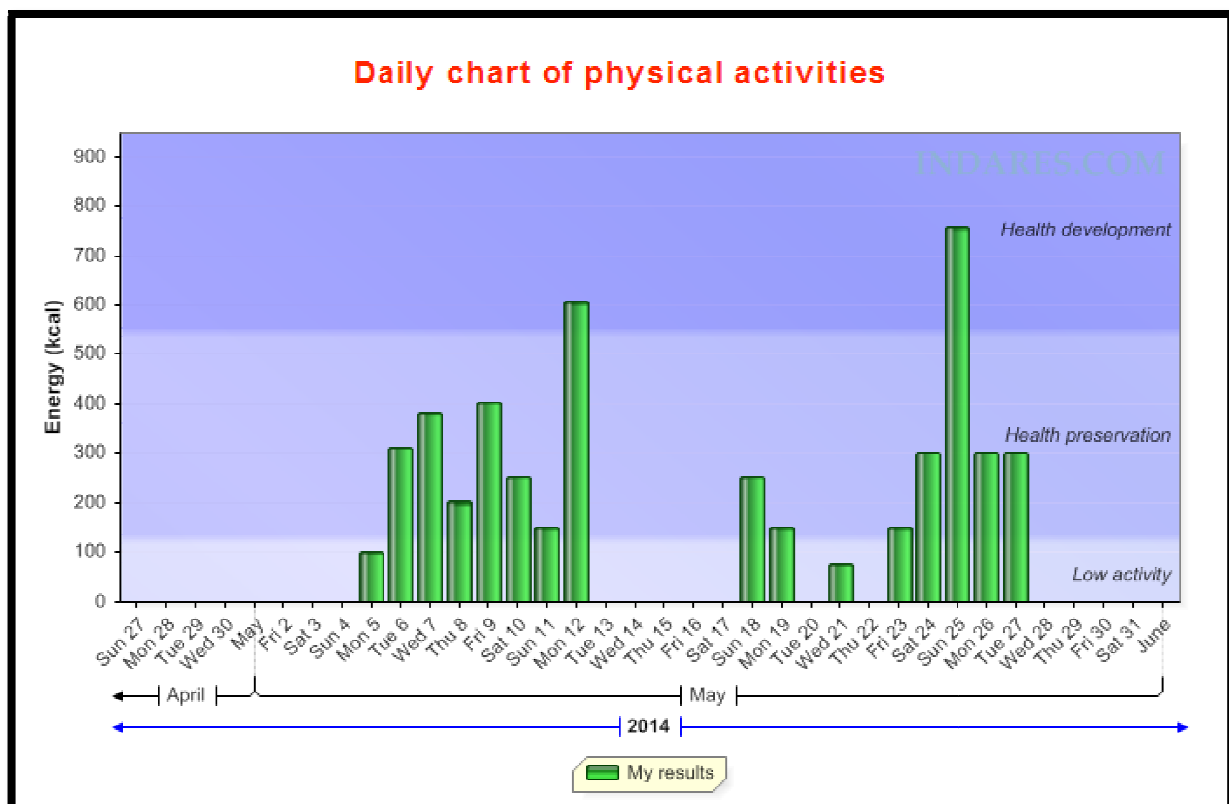


Figure 3. Daily chart of physical activities. Source: Indares (2014).

Based on the physical activity records several variables can be easily calculated. For example Chmelík et al. (2008) compared physical activity in students on weekdays and weekend days (Fig. 4). He also revealed most frequent forms of physical activity (Table 1).

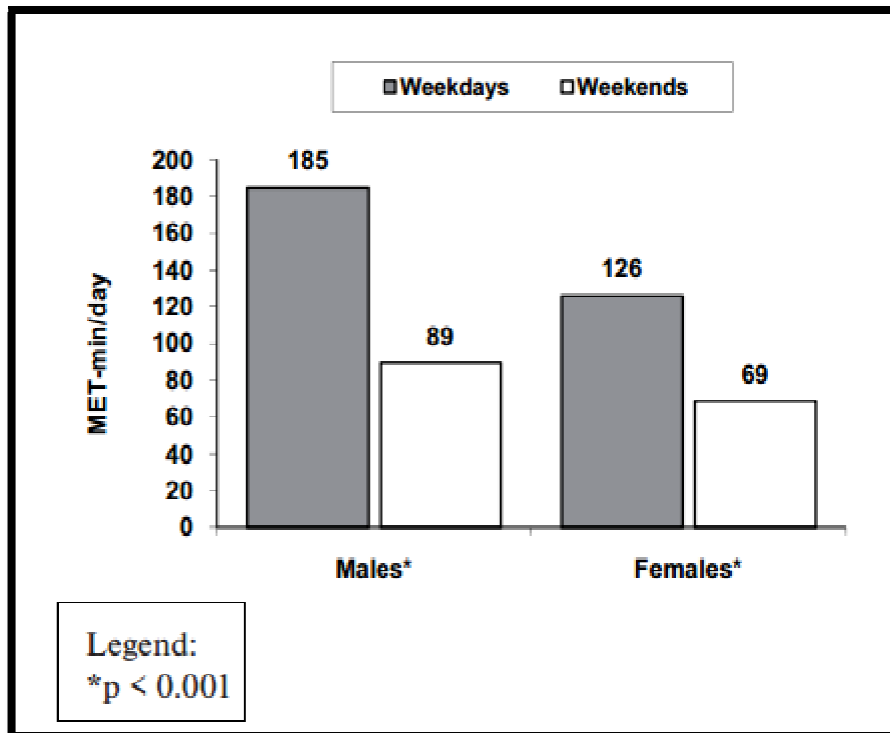


Figure 4. Comparison of average PA on weekdays and at weekends. *Source:* Chmelík et al. (2008).

Order	Males	Females
1	Weightlifting	Walking
2	Walking	Conditioning exercise
3	Running	Aerobics
4	Basketball	Dance
5	Bicycling	Running
6	Conditioning exercise	Volleyball
7	Dance	Basketball
8	Aerobics	Bicycling
9	Bowling	Games
10	Football	Swimming

Table 1. The most frequently performed PAs during the observed period of 12 weeks. *Source:* Chmelík et al. (2008).

STEPS

The Steps module presents an environment, in which daily step counts are recorded. Step counts are usually measured by a pedometer.

The system users learn to work with the instruments used for measuring physical activity and keep own record sheets. The users are informed of health recommendations in terms of walking volume; their own results are compared in a well-arranged manner (Fig. 5).

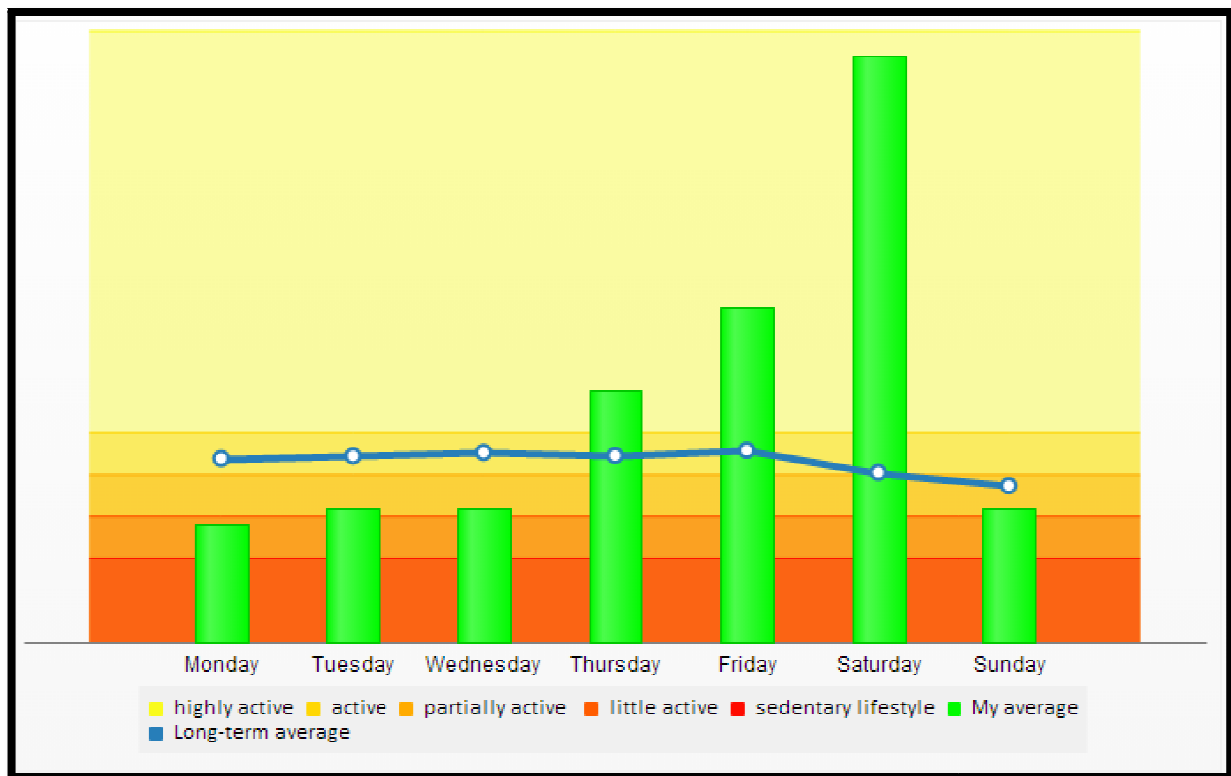


Figure 5. Weekly walk profile. *Source:* Indares (2014).

Several variables can be compared for scientific purposes: gender, days in a week, weekdays and weekend days, classes, schools, regions and countries. Sigmundová et al. (2013) compared step counts in men and women on various days (Fig. 6) and walking volume on weekdays and weekend days.

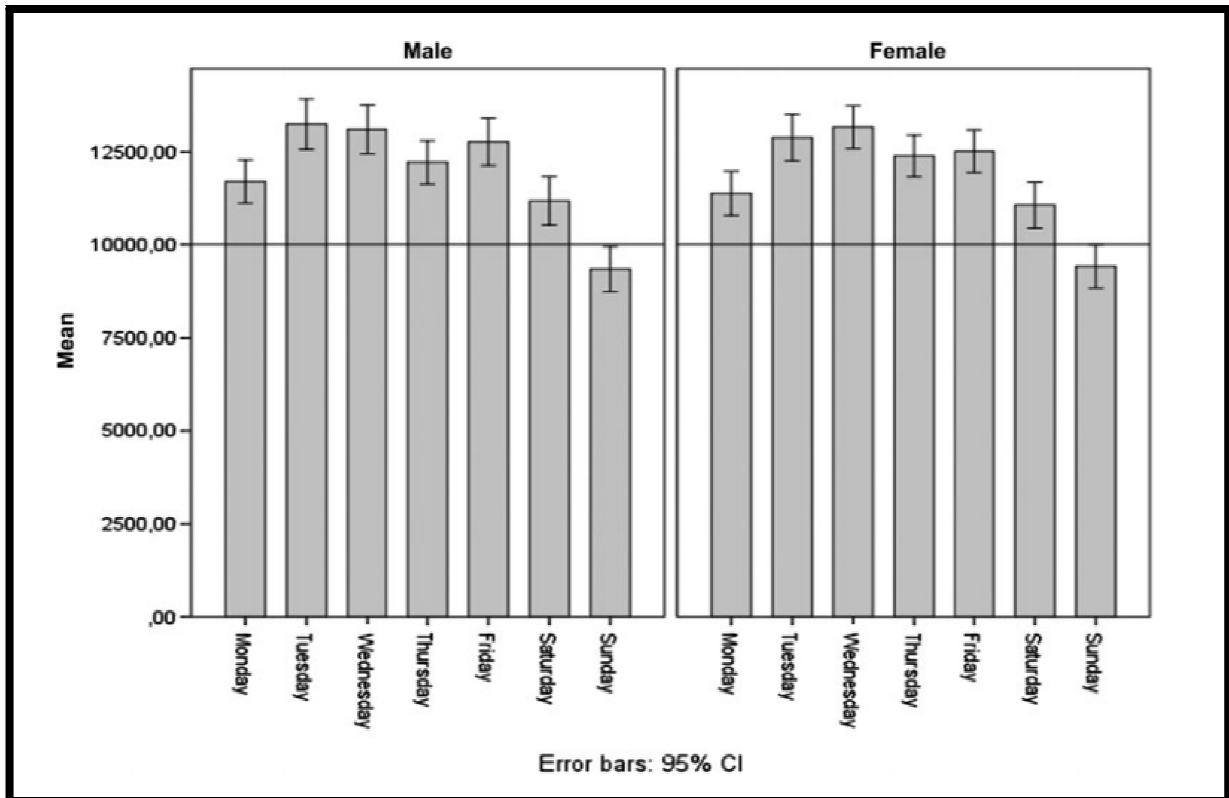


Figure 6. Number of steps per day by gender. *Source:* Sigmundová et al. (2013).

FITNESS ASSESSMENT

The following module includes a test battery suitable for self-assessment of physical fitness. It has a total of eleven motor tests and somatic measurements (Table 2). Each item of the test battery is described in detail and contains a video with relevant instructions (Nosek & Cuberek, 2011; Indares, 2014).

The Indares system is applicable in both school physical education and diagnostics and personal assessment of physical fitness in a family environment.

PHYSICAL FITNESS COMPONENT	TEST
HEALTH ORIENTED	
Body composition	BMI Waist and hip circumference
Aerobic fitness	12 min run 2 km walk

Muscle strength and endurance	Push-ups Modified sit-ups Chair squats Wall squats
Flexibility	Shoulder stretch V-sit and reach
Functional body parameter	Resting heart rate

Table 2. Physical fitness components assessed by Indares test battery. *Source:* Indares (2014).

ACTIVE TRANSPORT

The module comprises an interactive map connected with the Google database. In this map, the system users can mark the route they took and the means of transport. The system feedback indicates the proportion of active and passive transport (expressed in time or distance), step counts, energy expenditure, etc. on the users' regular journey to school or work.

The users learn to work with an electronic map and are informed about the proportion of activity on their transport (Fig. 7).

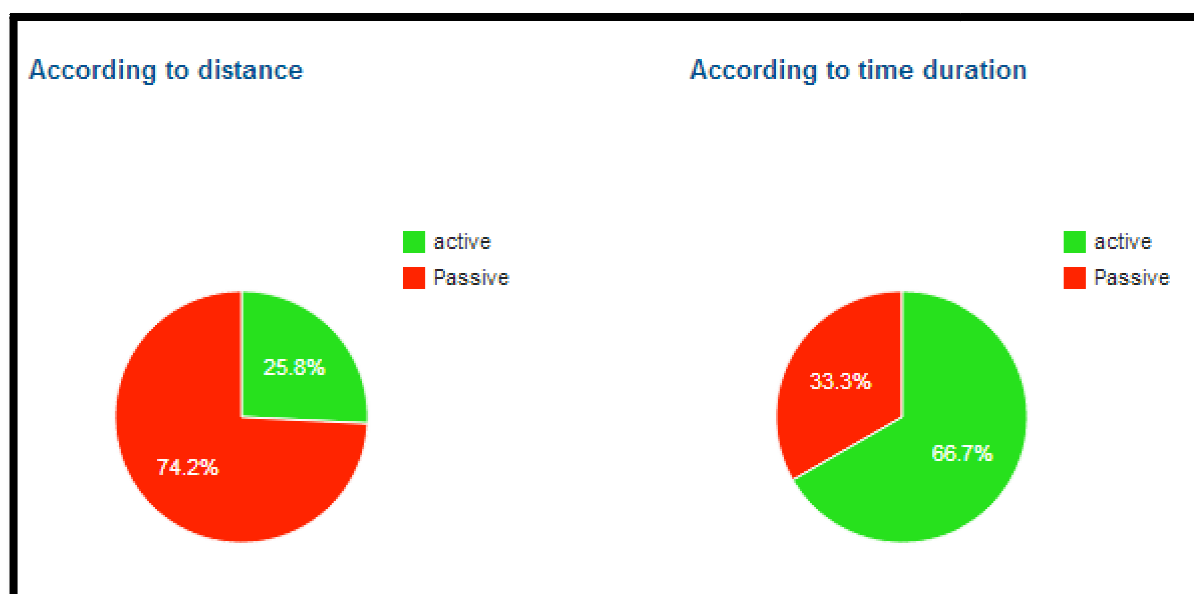


Figure 7. The ratio of active and passive transport. *Source:* Indares (2014).

This module reacts to the increasing negative trend of passive transport. Soon after the module was launched in the Indares system it was implemented into research. Kudláček et al. (2013) used this module to objectify the monitoring of active transport in adolescents.

Inclusion of the Indares system in PA monitoring in the context of active transport allowed the application of a triangulation approach (objective methods – subjective methods – Indares system), through which a flexible and available research tool was developed that reacts to modern aspects of PA research in the context of an environment. This module helped verify the fact that adolescents who achieve active transport of up to 1000 metres have a significantly higher level of physical activity on schooldays, with average activity ranging from 1 to 3 MET.

SURVEYS

This module currently comprises six questionnaires. In spite of certain benefits for the users, such as awareness of own sports preferences, assessment of own weekly physical activity or reflection of PA suitability of an environment, this module is primarily aimed at research data collection.

The sports preferences questionnaire has the greatest potential for educational purposes. Through this tool the teacher can find out about the types of activities his/her students prefer and adjust the teaching process accordingly. If the questionnaire is used before and after the teaching process, the teacher can verify the influence of the educational intervention on these preferences. Schools and towns can benefit from aggregate information from this questionnaire as they can immediately find out about the students' sports preferences and take them into consideration in designing organized physical activity. Similarly, the questionnaire aimed at the motives for physical activity can be valuable.

From a scientific viewpoint, the most beneficial questionnaires at the moment are those focusing on the level of weekly physical activity (IPAQ) and environmental conditions. The IPAQ (International Physical Activity Questionnaire) is a globally used questionnaire underpinning a number of recognized studies dealing with physical activity (Andrew et al., 2014; Fromel, Mitas, & Kerr, 2009; Okazaki et al., 2014; Vasickova, Groffik, Fromel, Chmelik, & Wasowicz, 2013; Wassink-Vossen et al., 2014). The “Environment” questionnaire is based on an internationally standardized questionnaire ANEWS, whose results are used in many environmental studies all over the world (Frank et al., 2010; Pelclova, Fromel, & Cuberek, 2014; Sigmundova, El Ansari, & Sigmund, 2011).

CONCLUSION

With the six active modules, the on-line Indares system has a great potential to support the educational and research process in the area of physical education and physical activity. Appropriate development and promotion of the system can result in a variety of applications in practical motivation for physical activity and effective research.

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