

Obesity and cardiometabolic risk management in students from Timișoara and Szeged University Centres

**Mihaela ORAVIȚAN¹, Claudiu AVRAM², Stela IURCIUC³,
Anna FEHÉRNÉ KISS⁴, Mária BARNAI⁵**

Abstract

This is the presentation of a project financed by the Hungary-Romania Cross-Border Co-operation Programme 2007-2013; the title of the project is "Obesity and cardiometabolic risk management in students from Timisoara and Szeged University Centres", code HURO/1001/116/2.4.2. The project aims to provide financial and logistical support to launch a joint program of cooperation between the Timisoara University Centre and University of Szeged. The project's proposal takes into account the needs in DKMT Euroregion, as well as the capacities and resources of both partners. This project is part of a priority axis entitled "Strengthen social and economic cohesion on the border area"; the key area of intervention is called "Healthcare and prevention of common threats" and the project's activities are integrated in a common action called "Joint institution building, coordination and training". The main objective of this project is to assess 1000 students from both University Centres (in regard to body composition and cardiometabolic risk - weight, waist circumference, fat, active mass, visceral fat area, waist to hip ratio, blood pressure, arterial stiffness and autonomic function, total cardiovascular risk and risk of diabetes) and to train the students from the target group in order to change their quality of life for medium and long-term, to change their physical activity level and their nutritional habits, despite to our common traditions.

Key words: *HU-RO, obesity, cardiometabolic risk, students*

Rezumat

Aceasta este prezentarea unui proiect finanțat în cadrul Programului de Cooperare Transfrontalieră Ungaria-România 2007-2013; titlul proiectului este „Managementul obezității și a riscului cardio-metabolic la studenții din centrele Universitare Timișoara și Szeged”, cod HURO/1001/116/2.4.2. Scopul acestui proiect este asigurarea finanțării și suportului logistic pentru lansarea unui program de cooperare între centrul universitar Timișoara și Universitatea din

¹ Assoc. Professor PhD, West University of Timișoara, Physical Education and Sports Faculty, *email: mihaela.oravitan@gmail.com*

² Lecturer PhD, West University of Timișoara, Physical Education and Sports Faculty

³ Assist. PhD, "Victor Babes" Medicine and Pharmacy University of Timișoara

⁴ Assoc. Professor PhD, University of Szeged, Faculty of Health Sciences and Social Studies

⁵ Assoc. Professor PhD, University of Szeged, Faculty of Health Sciences and Social Studies

Szeged. Această propunere ia în considerare necesitățile Euroregiunii DKMT, precum și capacitățile și resursele ambilor parteneri. Acest proiect face parte din axa prioritară intitulată „Întărirea coeziunii sociale și economice în zona transfrontalieră”; aria cheie de intervenție este aceea a „Sistemului sanitar și prevenția amenințărilor comune”, iar activitățile proiectului se integrează în aceea a construcției comune de instituții, coordonare și antrenare”. Principalul obiectiv este acela de a evalua 1000 de studenți din ambele centre universitare (în ceea ce privește compoziția corporală, riscul cardio-metabolic – greutatea, circumferința taliei, masa de țesut adipos, masa activă, suprafața de grăsime viscerală, indicele talie-șold, tensiunea arterială, rigiditatea arterială, funcția autonomă, riscul cardio-vascular total și riscul de a dezvolta diabet zaharat), de a-i educa pentru a le schimba calitatea vieții pe termen mediu și lung, de a schimba nivelul activității fizice realizate de aceștia, obiceiurile alimentare, în pofida tradițiilor comune.

Cuvinte-cheie: HU-RO, obezitate, risc cardio-metabolic, student

Background

The prevalence of obesity is high in this geographic area, confirmed by the EuroAspire III survey (the largest epidemiological study in the prevention of cardiovascular diseases in Europe) as well as the decrease of daily physical activity of the general population, confirmed by the "Special Eurobarometer 334 - Sport and Physical Activity" in 2010. In this European document is stated that 69% of Romanians and 53% of Hungarians says that they never play sport (1, 2)

The present proposal is complementary and has a synergy with other projects, unrolled by different European partners:

- International Cross-border project Romania-Serbia "For a strong woman - health, movement, harmony - for the obesity combat for women aged 15-25 years", was successfully finished in 2008, and was focused on assessing and reducing the obesity of young women;
- "European Action on Secondary and Primary Prevention of Coronary Heart Disease in order to reduce events - EuroAspire III" - the main epidemiological study in the field of cardiovascular prevention; Romania had one investigation center (in Timisoara) focused on identification of

cardiovascular risk factors in cardiovascular patients.

- The "European Heart Network" initiative - plays a leading role in the prevention and reduction of cardiovascular diseases, through advocacy, networking, education and patient support, so that they are no longer a major cause of premature death and disability throughout Europe;
- "European Heart Health Charter" initiatives - aiming to substantially reduce the burden of cardiovascular disease in the European Union and the WHO European Region and to reduce inequities and inequalities in disease burden within and between countries. Romania and Hungary have signed it in 2007 B54 with other 26 European countries this European document, which stated that: "Every child born in the new millennium has the right to live until the age of at least 65 without suffering from avoidable cardiovascular disease."

Aim

The project aims to provide financial and logistical support to launch a joint program of cooperation between the Timișoara University Centre and University of Szeged. It also will facilitate joint

development of Timisoara-Szeged cross-border cooperation and strengthening social and economic cohesion, to enhance quality and efficiency health-care management and prevention of cardiovascular and metabolic disease - the main problems responsible for increased morbidity and mortality in this geographical area. We propose a complex management programme, for 1000 overweight students, which involves evaluation of body composition, cardio-metabolic risk and specific lifestyle recommendations (dietary habits, physical activity, smoking and stress management) according to "European Guidelines on Cardiovascular Disease in Clinical Practice" and "European Guidelines on diabetes, pre-diabetes, and cardiovascular diseases". (3)

History of cross-border cooperation

At present, there is a traditional cooperation in the cross-border area between the Romanian and Hungarian counties on both sides of the border. This cooperation can be easily noticed at the level of local authorities, county authorities, as well as at the level of entrepreneurs, and was materialized in the creation of DKMT Euroregion in 1997. Recently, cross-border cooperation has intensified between non-governmental organizations. Nevertheless, some aspects of cross-border collaborations have not been sufficiently developed. In this context, the general aim of this project is to enhance quality and efficiency of obesity management and prevention of cardiovascular and metabolic disease - the main problems responsible for increased morbidity and mortality in this geographical area, mainly due to unhealthy traditional diet and sedentary behaviour.

Project Partners

The lead partner (LP) of this project is the *West University of Timișoara (UVT)* which coordinates and implements all activities programmed. The relevance is proven by our experience, and the professional contribution consists in the medical staff, educational representatives and researchers. Financially and organizationally, UVT is the largest university in the eligible area (11 faculties, 11,000 students), occupying first place in the national evaluation regarding research and development activities, the only Romanian University with yellow label in the SIR World Report 2010.

The project partner (PP) is the *University of Szeged (US)*, with 12 faculties, 27,000 students and more than 6,000 employees, is covering almost the entire field of sciences, comparable in the organisational level and size to Timisoara University Centre. The US will be involved in all major activities of the project (preparation, education and evaluation). US will provide the activities for 40% of the target group (400 students). All of the US team members are highly qualified for the proposed project activities and certify the goal achievement.

Students Ambulatory - County Hospital Timisoara (SA-CHT) SA-CHT provides primary care for all students in the University Center Timisoara (around 30000 students). It will be involved in the project with recruiting the students who meet the inclusion criteria, obtaining the students' consent and provide to the investigation team the blood test results (cholesterol, glycemia). Having one team member (Stela Iurciuc) working also for this institution, the communication between the Timisoara Universities and the project team is assured. The project is based on the partners' experience in joint healthcare activities and on their capacity to transfer the obtained information towards students, scientific

and professional communities. The proposal takes into account the needs in DKMT Euroregion (figure 1), as well as the capacities and resources of both partners. Joint planning of the project is clear from the content of the activity packages, where each partner's contributions and responsibilities are specified.

Complementary activities will ensure the joint implementation on both sides of the border, thus making sure that the impact will be cross-border. The partners will participate together in activities and the target groups in the Euroregion are the beneficiaries, as the aim is to strengthen the social and economic cohesion through joint use of the educational and healthcare prevention infrastructure. Coordination of the activities will be ensured by a Project Coordination Board.

For good communication between partners and also for the strengthening of the relations between them, there will be only one project team, with members from Timișoara and Szeged University Centres. It is formed of doctoral students and young teaching staff members, researchers and professors. This will make it possible to reach the objectives from the point of view of strengthening the collaboration relations by forming joint groups, as well as getting valuable results on the entire target group.



Figure 1. DKMT region (5)

The project will have a joint budget, which will be divided equitably according to the proposed objectives, the type and volume of activities, the number and type of the staff involved. Each partner will respect the measures regarding co-financing. The activities will be financed from the budget of each partner. Also, the staff expenses will be covered on both sides of the border due to the joint implementation team.

Partners' Experience in Health Programmes

UVT has vast experience in project administration at all levels, with national and international financing. The team which proposes the project has the experience of managing national and international projects, financed through Phare, Socrates, Erasmus, FP7 and Leonardo da Vinci. The team involved in the present project proposal has obtained financing for the following: "The founding of the Centre for Consultancy and Euro-Regional Rural Co-operation (CC&EU) to improve the ecological and conventional management regarding agricultural yield quality and quantity" value 220000 euro, project Phare CBC RO-HU, code RO 2005/017-536.01.01.01.25., "Establishment and implementation of the Regional Centre for energy research in vegetable bioresource" (BIOEN). At present, a part of the proposed team is running a HURO cross-border project entitled "Cross-border partnership-Education - Sport and Health in University".

Project partner has a large experience in projects like: "LipiDiDiet - Theurapeutic and preventive impact of nutritional lipids on neuronal and cognitive performance in aging, Alzheimer's disease and vascular dementia" (FP7-KBBE-2007-01/211696) value 7,400,000 euro, "Implementation of a regional project for translational medical research concerning diseases with high impact in population" -

HURO/0901/137/2.2.2, value 500,000 euro; "Szeged - Timisoara axis for the safe food and feed" - HURO/0901/147/2.2.2, 364,500 euro; "PreDict Computational prediction of drug cardiac toxicity" - FP7-ICT, 4,100,000 euro.

Project team

The **project team** will include both Romanian and Hungarian members, having the following structure: management team, including: Project Manager – makes sure that the project is put into practice and that the institution is properly represented, maintains an operative relation with the Management Authority for Cross-border Cooperation and with the contracting authority, draws technical reports, supervises project implementation and the operative relation with local authorities; Financial manager – provides all financial services necessary for project implementation and draws financial reports. The implementation team will be made of: 2 Logistic responsables (1 from LP, 1 from PP) coordinates the activity of the people involved in the project, participate in the evaluation and educational activities; Medical supervisor and dietary counselor; Scientific, 2 coordinators for Education (1 from LP, 1 from PP) - overseeing the compatibility of joint educational programs; 2 Scientific coordinator for physical activity (1 from LP, 1 from PP) - involved in the exercise training activities of the target group; 2 communication and international relations responsables (1 from LP, 1 from PP) Database manager: - develop and update the electronic database; 2 physical therapists (1 from LP, 1 from PP) - participate in the students' evaluation and lifestyle educational process. In LP's team are included members from all big universities of Timișoara: West University of Timișoara, "Victor Babeș" Medicine and Pharmacy University of Timișoara, Politechnik

University of Timișoara and from Banat University of Agricultural Sciences and Veterinary Medicine Timișoara.

Objectives

We propose a complex management programme for 1000 overweight students, which involves evaluation of cardio-metabolic risk and specific lifestyle interventions (dietary habits, physical activity, smoking and stress management) according to current European Guidelines.

The added value of the project consists in the preventive educational measures which reflect common needs on either side of the border area, which require common solutions. This is contributing to:

- increasing the awareness of cardio-metabolic risk in the young population, which will have a long lasting effect on prevention of cardiovascular and metabolic disease;
- increasing the social integration and quality of life of overweight students by involving them in lifestyle changing activities;
- increasing the degree of socialization in the cross-border area in the field of healthcare prevention;
- harmonizing the educational interventions of the two partners for the purpose of improving the obesity management.
- develop a preventive culture among young population which in future will have a good impact on the health of the population.

Our proposal is integrated in the general program by widening the area of collaboration with institutions in the EU, in view of harmonizing the interventions for reducing the cardio-metabolic risk and obesity, a common threat in the European healthcare system. At the national level, The Romanian Heart

Foundation (part of the European Heart Network), is stated in 2010 its mission: "to prevent the cardiovascular diseases and to reduce mortality by 10% caused by the cardiovascular diseases until 2015" (4). Healthcare is having an exceptional importance in the social and economic development of the DKMT region. The project proposed for financing is part of a larger plan of cooperation and partnership between UVT, other universities and research institutes in the cross-border area. Previous local research projects conducted in 2009 in the UVT showed that 38% of students are overweight and obese.

The present cooperation project will improve the local preventive strategies and will facilitate cross-border exchanges in the healthcare and educational area.

The **general objective** of the project, as well as the specific objectives, coincide with those of the programme, as they target Euroregional cooperation, focusing on bringing together people, institutions and communities in the cross-border area. This will facilitate the joint development of the region, by using the advantages specific to the cross-border area, namely the human and material resources of the partners involved. The activities performed will develop the cross-border cooperation by bringing together the specialists in the field of cardio-metabolic prevention and will facilitate joint training stages addressed to the target group. These activities will have quantifiable effects that will lead to the accomplishment of the program objectives. As a result of the project implementation, abilities and knowledge will be developed, by organizing common conferences and training stages, which will contribute to the improvement of the human healthcare in the cross-border

Participants

The target group of the project is composed by 1000 overweight and obese students (600 from Timisoara University Centre and 400 students from the University of Szeged), from a total number of 50000 students in the two university centres, who meet the inclusion criteria: Body Mass Index over 25 kg/m²; give a personal consent for participating in the project. The main etiological factors incriminated were: sedentary lifestyle and unhealthy diet. The epidemiological data, the cross-border traditional diet (high in saturated fat and sugar intake, poor fish, fresh vegetables and fruits consumption) and a preliminary analysis of the target group needs, conduct us for initiating this project proposal. The project will strengthen the cross-border cooperation between preventive healthcare specialists in order to improve obesity management and cardio-metabolic preventive programs. Considering the direct beneficiaries, both healthcare professionals and students from target group, the project will have a strong impact on the awareness and lifestyle management of students.

All the academic and healthcare community (students, teachers, health care specialists) of both university centres, who are in contact with the target group are potential indirect beneficiaries of the project. An epidemiological study conducted in the University of West from Timisoara in 2009 showed that the prevalence of overweight and obesity among students is 38%. Considering this, we can estimate this group to at least 10% (5000 people) from the whole academic and healthcare community in both centres. As a result of implementing the project, the conferences and training stages held in common in both centres will promote the importance of lifestyle (physical activity, optimal diet and nutritional behaviour) in order to maintain or lose weight and to prevent the onset of cardio-metabolic

disease. There are other people who can be considered into the indirect beneficiaries: the National Health Insurance Services, and the labour market for having healthy employees in the future.



Figure 2. Poster of the Inaugural Conference of the project



Figure 3. Inaugural Conference in Aula Magna of West University of Timișoara



Figure 4. The presentation of the University of Szeged representative in this project (Assoc.Prof. Maria Barnai, dean of the Health Sciences and Social Studies Faculty from University of Szeged)

The main benefit of the project on the target group is weight and cardio-metabolic risk reduction which will significantly improve their life quality. The added value is that the other conditions related to obesity will be favourable influenced (arthritis development, infertility, anxiety and depression). Also, another additional result is an increased interest among the students in regard to practicing different types of physical activity, intellectual performance and stress management. The educational stages (3 in Timișoara and 3 in Szeged) targeting lifestyle changes, the healthcare specialists will be trained to increase the efficiency of preventive interventions in order to reduce the burden of cardio-metabolic diseases in the cross-border area. Social cohesion will increase significantly among students, as well, the sense of healthy lifestyle importance and the sense of belonging to a supporting group.

For the inaugural conference, 200 people were invited: health specialists in the field of prevention and rehabilitation of cardio-metabolic diseases (medical doctors, physical therapists, nurses), health care providers (managers of hospitals, local health insurance representatives), local authorities, mass-media representatives (journals, radio and television), along with the cross-border team

members and representatives of the target group (figure 2-4). During the conference we presented the project program, objectives and expected results.

At the final conference which will be held in Szeged, in December 2012, LP and PP will present the activities performed and the results obtained, then conclusions will be drawn and bases will be set for another possible future collaboration. All partners involved in the project will participate, as well as students, representatives of County Department of Public Health, representatives of local authorities and mass-media from both countries (200 people).

In order to increase the visibility of the project we contracted a web-design company for creating a dedicated website (www.riskred.eu) which is updated every month with informations about the project, pictures of the past activities along with the advertisements of the future activities in the project.

Activities

We will purchase specific equipment and materials necessary for project implementation in order to obtain the expected results. Thus, the investigation base of UVT and of US will be improved by the acquisition of Arterial stiffness measurement devices in order to make a non-invasive assessment of the cardiovascular system, focused on arterial stiffness and autonomic function. The University of Szeged will buy also a body composition analyzer and a pedograph in order to establish the body composition and to measure the coherence between arterial dysfunction and the pressure distribution of the feet at the target group students; the West University from Timisoara already have these devices and they could not be shared because of technical issues. Also, for the good implementation and follow up of the physical activity and exercise

training programmes we will use 100 physical activity monitors (completed by 50 pieces from the project budget) and 50 exercise intensity monitors (completed by 20 pieces from the project budget).

a. Training stages

We will perform a series of common joint training stages, in which we will: 1. perform the exchange between partners in view of joint development of prevention strategies; 2. increase the awareness of health specialists to effective primary preventive measurements 3. Educate and train the students from the target group in regard to lifestyle management in order to reduce weight and combat cardio-metabolic diseases. For this purpose, six stages of joint training stages will be organized (3 themes presented in Timișoara and Szeged), comprising the following courses:

- *"Obesity as a risk factor for cardiovascular and metabolic disease";*
- *"Healthy diet, nutritional behaviours and stress management";*
- *"Optimal physical activity for the prevention and treatment of obesity and related diseases".*

Also will be analyzed and make proposals for university leadership in the cross-border area for adaptation the educational curricula in order to include at list two hours of organized physical activity. At the same time, we will facilitate the students' mobility in order to present educational offer and lifestyle (nutritional habits, type of physical activities) in the cross-border area.

b. Target group assessment

We will obtain the personal consent and evaluate 1000 students (600 from Timisoara and 400 from Szeged) in regard to body composition and cardio-

metabolic risk (weight, waist circumference, fat, active mass, visceral fat area, waist to hip ratio, blood pressure, arterial stiffness and autonomic function, total cardiovascular risk and risk of diabetes). It will be used the research devices already present in our institutions completed by those mentioned in the project budget. It will be used also questionnaires (SCORE charts - for evaluation of total cardiovascular risk and FINDRISK for the risk of diabetes). Other measurements will be done by using pedograph: to analyse the correlations between the degree of the decreased arterial circulation, the pain appeared in rest or in exercise and the abnormal pressure distribution on the foot. The measurement will be done in order to determine whether the overload caused by overweight or circulation is the primary factor in the leg pain.

Predicted results

1. This evaluation will allow us to establish the prevalence of cardio-metabolic risk factors among students in the cross-border area - this study being the first survey in our region which have such a complex approach with a large number of young subjects. In the same time the evaluation will increase the awareness and motivate the students from target group to participate in the educational activities of the project. The evaluation process give us instant results which will be discussed with each subject in the programme in the same session. It will be developed a preventive strategy by implementing this project which is applicable in young overweight patients and consists in 3 major mechanisms: evaluation, recommendations and follow-up. The epidemiological results will be published in a major scientific journal, and the project financial support will be mentioned.

2. It will update the electronic database of students from the target group (600 from Timisoara and 400 from Szeged) with the data resulting from evaluation.
3. We will share our individual experience in the management of obesity and cardio-metabolic diseases for the benefit of both partners; after closure, we suppose that the target group formed by 1000 students from both university centres will have a better quality of life for medium and long-term, with better nutritional habits, despite to our common traditions. We suppose that the incidence of cardio-metabolic diseases - a common threat in this area - will decrease due to this kind of actions.

Risks in the project implementation

For this project we have identified and analysed the following external and internal risk factors: difficulties in establishing partnership relations, difficulties in creating joint healthcare prevention programs, delays caused by changes in the legislation concerning acquisitions. The possible difficulties related to the common methodology of implementation and establishing partnerships can be surpassed through the competence and experience of the proposed team in the field of managing international projects of development and cooperation.

Risk identification will be performed regularly. We will take into consideration both internal and external risks. Internal risks can be controlled or influenced by the project team, while external risks cannot. The risk will be identified by means of editing control lists comprising potential risk sources, such as: expected results, staff members, changes in objectives, errors and omissions in

projection and execution, cost and deadline estimations.

Discussions

A true health problem in this cross-border area is a high prevalence of obesity, mainly due to the bad nutritional habits of the citizens from this geographical area and, secondary, to a modern lifestyle characterized by a low level of physical activity and high level of stress. Also, it is known (EuroAspire surveys) the higher prevalence of cardiovascular and metabolic diseases related to obesity in this part of Romania and in the cross-border Hungarian area. Our objectives are related to these common threats and are not limited by boundaries. Our proposed solutions are common for the entire cross-border area and should decrease in the same time the incidence of obesity and have a positive influence on lifestyle.

The obesity management is a complex and difficult issue; such a cross-border prospective for a common health problem, could be innovative from the point of view of its trans-disciplinary approach; our team consists from doctors and physical education teachers - so the main aspects (dietary counseling and physical training) of obesity treatment are covered. Other innovative aspects of our project are the assessment of cardio-metabolic risk on a young and overweight population, followed by reinforcement in lifestyle changes, and the use of activimeters for monitoring the daily physical activity and exercise training intensity. This structured intervention is cost-effective and will have a positive impact on the onset of obesity related cardio-metabolic diseases (diabetes mellitus, ischemic heart disease, stroke etc.). At present, there is no cross-border cooperation on this theme, despite the

fact that obesity is a well-known healthy problem in both countries.

The possibility of generating multiplying effects resides in the remarkable dissemination capacity of the partners. These dissemination actions can reach institutional dimensions by assimilating the most efficient training modules of the target groups, thus generating multiplying effects. The project can represent a model for other institutions, associations and public authorities. The network of communication and cooperation between the two partners, initiated during the project, will be enlarged by attracting new members. Another source of multiplication of the project results resides from promoting the advantages to the beneficiaries, and the increase in the number of partnerships between the two partners in the project. The partnership created during the project implementation, will be expanded from the point of view of diversity, complexity and cross-border impact, becoming an important information tool on both sides of the border.

The structures and institutions which support the project implementation will function after the project is finished, being kept together by the same aims and motivations. After the project's closure the institutions will maintain these activities by giving financial and logistical support. The communication between partners and members in the network will be achieved through the people delegated by each institution. These will collaborate and communicate permanently, both through traditional means of communication (mail, telephone, fax), as well as through electronic means (e-mails).

We propose a follow-up after 5 years using the database of subjects investigated during the project implementation; every year (between 2011 and 2016) we will try to assess these students (for body

composition and cardio-metabolic risk) in order to investigate the progression of the cardio-metabolic risk factors, and the onset of obesity related disease. In the same time we will reinforce them to maintain the healthy habits gained during the project implementation. Moreover, the partners agree on developing the cooperation initiated in the project with other similar organizations. The results of the project will be made public and will be put at the disposal of everyone interested.

Conclusions

Our project will have an impact on a broader area due to the large target group formed by students of two big university centres. On this project, the young people will be aware about the importance of practicing physical activities and of having a healthy diet; they will be thought how to conduct a proper physical training programme using modern devices (activmeters) and how to adopt a healthy diet from both quantitative and qualitative point of view. Also, the students will have the instruments and knowledge to manage their body mass and physical activity in order to achieve their mid- and long-term goals regarding body composition and prevention of cardio-metabolic diseases. More than this, we

suppose that these healthy lifestyle habits will be transferred also to their friend and families, amplifying the long-term impact of our project. In the same time we expect to have a long-term reduction of cardiovascular and metabolic disease prevalence in the cross-border area.

Another long lasting impact will be seen when the healthy lifestyle habits will be transmitted to the descendants of this target group.

References

1. Kornelia Kotseva K., Wood D., De Backer G., De Bacquer D., Pyorala K. and Ulrich Keil U. on behalf of the EUROASPIRE Study Group (2009) *EuroAspire III survey - a survey on the lifestyle, risk factors and use of cardioprotective drug therapies in coronary patients from 22 European countries*, European Journal of Cardiovascular Prevention and Rehabilitation, Apr;16(2):121-37;
2. *** *Special Eurobarometer 334 - Sport and Physical Activity* (2010) <http://www.euoffice.euolympic.org/cms/getfile.php?316&download=1>, accessed in 12.01.2011;
3. De Backer G (2003) *European Guidelines on Cardiovascular Disease in Clinical Practice*, European Heart Journal, Volume 24, Issue 17, Pp. 1601-1610.
4. Ryden L. and colab. (2007) *Guidelines on diabetes, pre-diabetes, and cardiovascular diseases*, European Heart Journal Volume 28, Issue 1, pp. 88-136;
5. *** http://www.huro-cbc.eu/ro/aria_eligibila, accessed in 12 03.2012.