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Chapter 17. FUNCTIONAL EVALUATION IN PHYSIOTHERAPY EDUCATION. INTERNATIONAL RESEARCH WITH USE E-LEARNING PLATFORM

17.1. Introduction

One of the important health challenges of the 21st century is facing with development of civilization diseases and decreasing quality of life associated with it. In this regard, the gradual ageing of the population will be one of the crucial social change agents. According to Eurostat [1] the impact of demographic ageing within the European Union (EU) is likely to be of major significance in the coming decades. Additionally, low birth rates and higher life expectancy are changing the shape of the EU-28's age pyramid. It is estimated that the share of people aged 65 years or over will account for 28.7% of the EU-28's population by 2080 and people aged 80 years or above in the EU-28's population is projected to more than double between 2015 and 2080, from 5.3% to 12.3%.

While most people are aware that successive generations are living longer, less is known about the health of the EU's ageing population. In 2014, the number of healthy life years at birth was estimated at 61.4 years for men and 61.8 years for women in the EU-28; this represented approximately 79% and 74% of total life expectancy for men and women [2]. According to Eurostat [3] more than one-quarter of the EU-28 population which was self-reported regarding health experienced long-standing

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limitations due to health problems. Moreover, 26.9% of the population aged 16 and over reported some (moderate or severe) long-standing limitations in their usual activities due to health problems in 2013; 18.3% reported moderate long-standing limitations and 8.7% reported severe long-standing limitations. Taking into account severe long-standing limitations regarding the individual EU Member States, the highest shares of people reporting them were registered in Slovakia, Austria, Italy, Latvia, the United Kingdom, Germany and Greece, all 10% or higher. It can be concluded that the problem of heavy functional and activity limitations of (even young people) is present in countries regardless of level development.

Another research namely the European health interview survey (EHIS) conducted between 2006 and 2010 surveyed persons aged 15 and over and included questions about any physical or sensory limitations indicated that in all of the participating EU Member States, among people aged 65–74, around two thirds or more reported physical and sensory limitations, a share that peaked at close to 90% in Latvia and Romania. Moving to the oldest age group for which data are available, persons aged 85 and over, the share of people reporting physical and sensory limitations exceeded 95% in 11 of the 12 Member States for which data are available, the exception being Hungary (91%).

The presented data above and results of research on healthy life years are strictly linked to the quality of life, and represent those years that may be enjoyed by individuals free from the limitations of illness or disability. Chronic disease, frailty, mental disorders and physical disability tend to become more prevalent in older age, and may result in a lower quality of life for those who suffer from such conditions. The consequences are not only addressed for people suffered but also for healthcare system and economy (increased social expenditure related to population ageing, in the form of pensions, healthcare and institutional or private (health) care). In fact, the healthy life years monitor health as a productive or economic factor. Hence an increase in healthy life years is one of the main goals of EU health policy, given that this would not only improve the situation of individuals (as good health and long life are fundamental objectives of human activity) but would also lead to lower public healthcare expenditure and would likely increase the possibility that people continue to work later into life. If healthy life years increase more rapidly than life expectancy, then not only are people living longer, but they are also living a greater proportion of their lives free from health problems [2].

Taking into account this problematic background the important question is how to improve the extra years of life gained through increased longevity to spend them in good health and how to predict and prevent functional impairments of people.

The crucial areas, through which this improvement is feasible, are: learning new or supplemented competencies of physicians and creating new or supplemented healthcare procedures, the aim of which is to predict and prevent functional and activity limitations of people of different ages. Nowadays most medical students are trained to deal with structure and physiology and not function and disability. Actually, according to the research, it can be stated that function, impairment or disability are words in which many physicians have little interest or are ignored [4, 5].

Another problem of today's approach to diagnosing and treatment of physical impairments is focusing particularly on the musculoskeletal system (physical health) and lack of including in the evaluation model an integration approach taking into account also neurological, cognitive system (mental health) and social environment (social integration). According to research, such an approach is confirmed as equally important [6].

EU countries should be obligated to health promotion policy, however, it is needed the creation of new knowledge on how age, disability onset/duration, and type of limitation influence health and quality of life across adulthood. According to recent research this could identify when and for whom health promotion services are most critical in greater to optimize health and quality of life and reducing the risk of disability [7, 8].

As confirmed in research, the knowledge and technological innovation reached in the field of health sciences have grown considerably in recent years. Particularly, the scientific and technical advances achieved in the field of Functional Evaluation (FE) have become a revolution in the way practitioners identify, treat and assess many of the syndromes and pathologies with the highest impact on the quality of life of people. FE scope goes beyond the physical dimension, and it takes into account perceptions, needs and preferences. Particularly, FE collects the required technologies and methods to assess how people perform daily life activities (DLA), focusing on (1) the musculoskeletal system (physical health), (2) the neurological and cognitive system (mental health), (3) social environment (social integration).

It is believed that FE is an appropriate way to address current and future socio-sanitary challenges in Europe because FE supports the diagnosis. Sometimes, conventional diagnostic techniques do not allow clinicians to make objective decisions because

diseases have an indeterminate origin or an organic lesion cannot be found to justify their occurrence. In other cases, results from FE methodologies complement conventional diagnostic techniques and help clinicians gain a broader and more realistic picture of patients' conditions. FE improves monitoring of patient development and treatment effectiveness. Because FE collects quantitative methods, by comparing their results, it is possible to quantify the development of patients or the impact that each type of treatment has on them. As a result, patients will receive better health care based on more accurate diagnoses and improved treatments. Healthcare assistance will be more focused on what patients are doing and how they are doing it, thus improving their quality of life. As FE enables more accurate diagnosis and helps improve treatments, national health systems will increase their efficiency and sustainability. FE supports the prediction of possible diseases and problems related to functional limitations and activity restrictions, making it possible to prevent them at an early stage of diagnosis.

Taking into account the proposition of including FE in the educational path, the original e-learning course was developed as a part of the international project "Development of innovative training solutions in the field of functional evaluation aimed at updating of the curricula of health sciences schools" and disseminate within students and lectures of health sciences schools as well as physiotherapists. Based on this, the paper aims to present research outcomes on the interest level of people who participated in the course, especially from point of view of the FE approach to diagnosis and treatment.

17.2. E-learning course evaluation methodology

The course was created taking into account the progressing phenomenon of population aging and the related problem of long-term functional limitations (physical, mental and social) affecting an increasing number of people, especially the elderly.

The main objective of the course was to familiarize participants with FE issues and, in particular, with elements of biomechanics that are one of the areas of interest in FE.

An online course integrated into the web has consisted of four basic modules divided into chapters: (i) Functional Evaluation: Concept and Methodology; (ii) Foundations of Biomechanics applied to the Locomotor System; (iii) Biomechanics of Spine; (iv) Biomechanics of Gait.

The view of the e-platform is shown in Fig. 1.

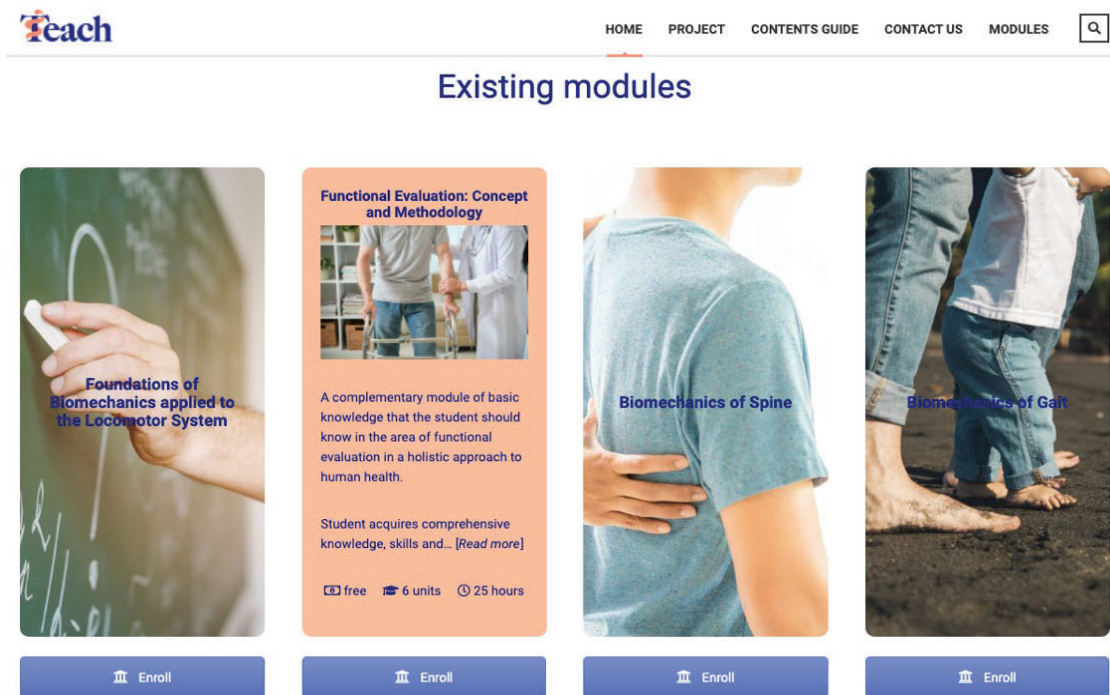


Fig. 1. View of the e-learning platform

Rys. 1. Widok platformy e-learnig

<https://teach.ibv.org/>

Every module includes from 4 to 6 topics with comprehensive and general information presenting the most important aspects of biomechanics, anthropometry and physiology. A module contains theoretical content with elements of practice, that formats are video and pdf as a script ready for download.

The expected study time for a module is 25 hours, which corresponds to 1 ECTS credit.

The course was dedicated to students, lecturers and physiotherapists. The course was very popular among students all over the world, even from India, Bolivia, Mexico and Georgia, however, the largest number of participants came from Europe. Classifying participants in terms of universities, the largest number were students of the University of Bydgoszcz – 535 participants, David Tvildiani Medical University – 36 participants, University of Valencia – 45 participants, Medical University in Lublin – 4 participants, Bydgoszcz University Enterprise of Knowledge – 2 participants. The geographical location map of participants and the percentage from universities are shown in Fig. 2 and Fig. 3 respectively.



Fig. 2. Territorial coverage of the TEACH course countries
 Rys. 2. Zasięg terytorialny kursu TEACH w państwach Europy
 Own elaboration

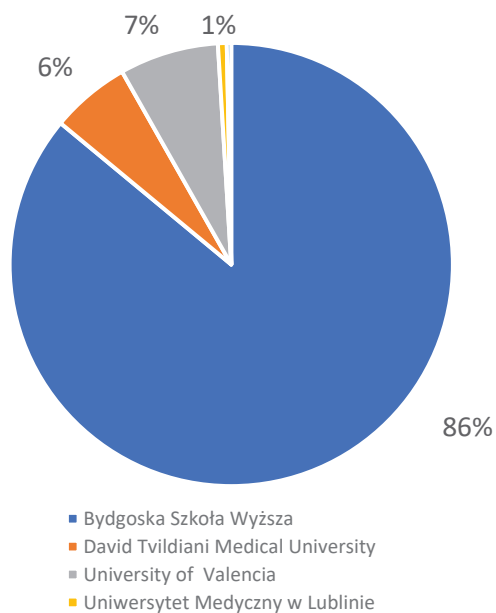



Fig. 3. The percentage of participants from all universities
 Rys. 3. Procentowy udział uczestników z badanych uniwersytetów
 Own elaboration

For the verification study, a questionnaire form was developed to measure course participant satisfaction, particularly interest in the topics and the relevance of each module, that overall look is presented in the Fig. 4.



Development of innovative training solutions in the field of functional evaluation aimed at updating of the curricula of health sciences schools

STUDENTS' SATISFACTION SURVEY

Next, we will ask your opinion about the materials and activities carried out in the class you just attended. In addition, we will ask you for some information related to your academic training.

This survey is completely anonymous and includes a total of 7 questions. The estimated time it will take to answer this survey is 5 min.

Academic training

- Country
- University
- Career/Degree
- Subject in which the contents of the TEACH project have been used

5. Which ONE of the following didactic units are you going to evaluate?

Module Biomechanics: foundations of biomechanics applied to the locomotor system

Unit A: Movements

Unit B: Forces and pressures

Unit C: Physiological signs and morphometric parameters

Unit D: Techniques for the instrumental analysis of movements and forces. Includes D1 and D2

Unit E: Techniques for the instrumental analysis of physiological signs and anthropometric and morphometric parameters. Includes E1, E2, E3 and E4

Unit F: Requirements of a biomechanical assessment system. concepts of validity, reliability and accuracy. Includes F.1. and F.2.

Fig. 4. An excerpt from the prepared questionnaire
Rys. 4. Fragment ankiety weryfikacyjnej
<https://teach.ibv.org/>

17.3. Results and discussion

The results of the survey allowed for quantitative analysis of interest in the course. Moreover, the obtained data allowed for the assessment of the attractiveness of individual modules and the topics included in them.

As illustrated by the data presented in Fig. 5, the module on concepts and methodology in the functional evaluation was the most popular course (Module 1). This course was evaluated by 255 students of health sciences schools. Important information from the point of view of quantitative analysis of the received data would be the information about the course and the semester studied. Then the number of questionnaires of respondents per 100 students of a given course would allow us to obtain absolute values indicating the actual interest in the chosen course (for future use).

The second group that participated in the survey was the academic staff, who, like the students, were asked to complete a survey on how they rated their satisfaction with the course. The first question on the survey was which module you rated. The number of responses in terms of course evaluations mapped the degree of interest in a particular course. Figure 5 presents quantitative data in terms of course modules evaluated. As can be seen from the data presented, the module on the foundations of the biomechanics of the locomotor system "Module Biomechanics: foundations of biomechanics applied to the locomotor system" was the most popular among the group of academic teachers.

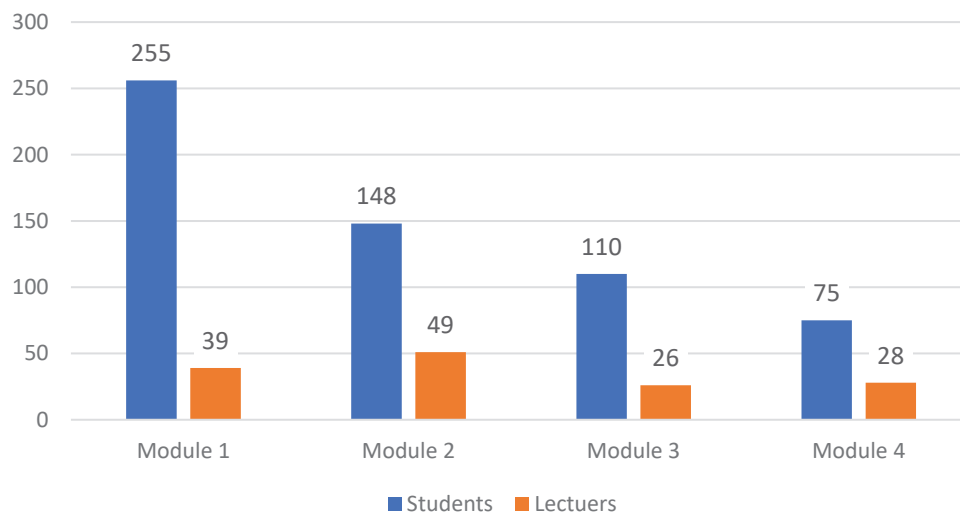


Fig. 5. Number of participants by choice of course modules

Rys. 5. Liczba uczestników w podziale na wybór modułów kursu

Legend: Modul 1: Functional Evaluation: Concept and Methodology; Module 2 Foundations of Biomechanics applied to the Locomotor System; Module 3: Biomechanics of Spine; Module 4: Biomechanics of Gait.

As can be seen from the data presented in Table 1, the greatest interest among students was: Classification of activities and functions according to the International Classification of Functioning, Disability, and Health (ICF) – 28%, The importance of cognitive abilities in performing motor tasks and why it is important to include biomechanical analysis in cognitive impairments – 19%; Importance of functional assessment and its application – 18%; Classification of functional impairments and disabilities – 16%; Socio-health impact of disability. Disability in the workplace – 11%; Functional assessment analysis: classical assessments versus instrumental analysis – 8%.

Table 1

Results of interest for individual chapters of Module 1 "Functional Evaluation:
Concept and Methodology"

Name of units	Country				
	Colombia	Georgia	Poland	Spain	Total
Unit A: Classification of activities and functions according to the ICF		2	68	3	73
Unit B: Importance of functional assessment and its applications		1	42	2	45
Unit C: Classification of functional impairments and disability		2	36	2	40
Unit D: Socio-health impact of disability. Disability in working places		1	26	1	28
Unit E: Importance of cognitive abilities in the performance of motor tasks and why it is important to include biomechanical analysis in cognitive impairments	1	1	23	24	49
Unit F: Functional evaluation assessment: classical assessments vs instrumented analysis			19	1	20
Total	1	7	214	33	255

As in the case of lecturers, the Module Functional Evaluation: Concept and Methodology were chosen as the second most interesting. The first one was Module Foundations of Biomechanics applied to the Locomotor System.

As can be seen from the data presented in Table 2, the most interesting chapter in module one was the chapter on the mechanics of body motion (dynamics). Among all the chapters in this module, the first chapter was selected most often – 21 times, which is 43% of the submitted evaluations.

Table 2

Results of lecturers' interests in particular chapters of Module 2 "Biomechanics: foundations of biomechanics applied to the locomotor system"

Name of units	Country		
	Poland	Spain	Total
Unit A: Movements	11	10	21
Unit B: Forces and pressures	4	4	8
Unit C: Physiological signs and morphometric parameters	3	2	5
Unit D: Techniques for the instrumental analysis of movements and forces. Includes D1 and D2	2	2	4
Unit E: Techniques for the instrumental analysis of physiological signs and anthropometric and morphometric parameters. Includes E1, E2, E3 and E4	4	1	5
Unit F: Requirements of a biomechanical assessment system. Concepts of validity, reliability and accuracy. Includes F1 and F2	6		6
Total	30	19	49

Among students, the FE module was the most popular, which may be due to the growing interest in patient diagnosis, which is based on the overall functioning of the body, rather than on a selected disease entity.

It is quite surprising that teachers' interest is directed towards aspects of the biomechanics of movement rather than FE approaches. This may be related to a certain pattern of education developed over the years in which FE topics were not popular.

17.4. Conclusion

The utilitarian goal of the e-learning course of FE is to update and reinforce the skills of the next generation of graduates in health sciences schools. The specific innovative training program was developed taking into account the wide spectra of needs and requirements of health sciences teachers from all over Europe and always regarding the future scenario of European health.

As indicated by the results of the international survey with the participation of students and teachers, the most interesting topic among students was Modul containing knowledge about Functional Evaluation: Concept and Methodology. It means that the FE area is a desirable component for future medics. For this reason, FE should be implemented into the curricula of health sciences schools.

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FUNCTIONAL EVALUATION IN PSYCHOTHERAPY EDUCATION. INTERNATIONAL RESEARCH WITH USE E-LEARNING PLATFORM

Abstract

This paper presents findings on the importance of functional evaluation (FE) as one of the teaching topics for therapists against the background of an international European project. The problem of the aging population becomes the basis for activities in predicting and preventing functional limitations and activity limitations of people of different ages. From the point of view of health sciences, it seems reasonable to implement FE as an element of the educational path integrating a comprehensive approach to diagnosis and treatment of physical disability. Presented results indicate interest in the mentioned topics among students, lecturers and physiotherapists from many European countries and others.

Keywords: functional evaluation, physiotherapy, e-learning, education