

# I.M.Health Fitness Assessment Method

(WP3\_D3.2)

## I.M.Health

**ERASMUS+ Sport**

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# 1 Introduction

The *Innovative Methods for preserving and enhancing health in the 21st century* (I.M.Health) project was co-funded by the Erasmus+ Programme of the European Union and implemented between January 2023 and December 2024.

The Consortium consisted of the leading organisation, Hungarian Water Skyball Federation (Hungary) and its partners: the German Sports University Cologne (Germany), United World Games (Austria), Fontanus Scientific Methodological Research and Educational Center (Hungary), and Institute Popotnik (Slovenia).

The I.M.Health project focuses on how people's need for physical activities have changed and evolved due to the changes in lifestyle in the XXI. century, and on developing innovative methods that address these changing needs.

Throughout the project, we want to highlight the positive effects of sports and exercise on the physical and mental wellbeing and develop new training methods to educate especially young adults, a demographic group which historically is not as interested but already shows musculoskeletal and/or health related issues due to the sedentary lifestyles of our century.

As part of the project, our aim was to develop a new, innovative fitness assessment method that is a powerful step forward in prevention. The partners' decades of experience in sport, health promotion and development, and musculoskeletal rehabilitation formed the basis for the creation of a new method. The new method is also applied on a selected group of people in each partner country, who is involved in health-enhancing training programs during the project, and retested for fitness changes after the training program. This way we also apply the new method in practice, and get first-hand feedback about fitness practitioners and the participants in the assessment about its application.

This guide describes the new fitness assessment method and details on how to use it.

## 2 About the I.M.Health fitness assessment method

What is fitness assessment?

Fitness assessments are a series of tests that measures and monitors people's physical fitness level. The series of tests assess the five components of physical fitness that make up total fitness: cardiovascular endurance, muscular strength, muscular endurance, flexibility, and body composition.

Our goal was to create a useful method for fitness practitioners (P.E. teachers, coaches, sports instructors) and for ordinary people who want to test easily their fitness level.

Characteristics taken into consideration during the creation of the method:

- Easy to apply
- Easy to execute
- No prior training required
- Can be measured and repeated at any time
- Allows for a large number of participants to be assessed in a short time
- A wide range of abilities can be measured
- Easy to evaluate
- The evaluation is clear and straightforward, providing useful feedback to the participants
- Participants get an overview about their health and fitness, with their potential musculoskeletal and health problems highlighted.

### 3 Tests

In order to create a comprehensive assessment method, the I.M.Health fitness assessment consists of 3 types of tests:

- 1) Five physical exercises
- 2) Measuring body composition
- 3) 2 questionnaires.

It is important to start the assessment with explaining the procedures to the subjects. A prerequisite of the assessment is the screening of health risks of the subjects and obtaining informed consent. Afterwards, the assessment forms should be prepared and the recording of basic information such as age, height, and gender.

Before starting the physical tests, a standard warm-up should be performed. Furthermore, each test exercises should be demonstrated so the execution is clear for the subjects.

## 4 Five physical exercises Tests

### 4.1 Plank

- Goal: to test the core muscle strength
- To hold an elevated plank position as long as one can, until max 2 minutes
- Measuring the time of each subject
- With standardized cone and ball placed between the subject's shoulderblades: this ensures the correct plank position as if the hip or head drops or rises, the ball falls down
- Test is over when the subject is unable to hold themselves or the ball falls down from his cone
- Equipments required:
  - flat and clean surface
  - water skyball ball (or similar sized plastic ball)
  - cone
    - e.g.: [https://www.decathlon.hu/p/teniszboja-12-db/\\_/R-p-121747?mc=8330435](https://www.decathlon.hu/p/teniszboja-12-db/_/R-p-121747?mc=8330435)
  - stopwatch
  - recording sheets, pen

*Plank test*

*(Picture 1)*

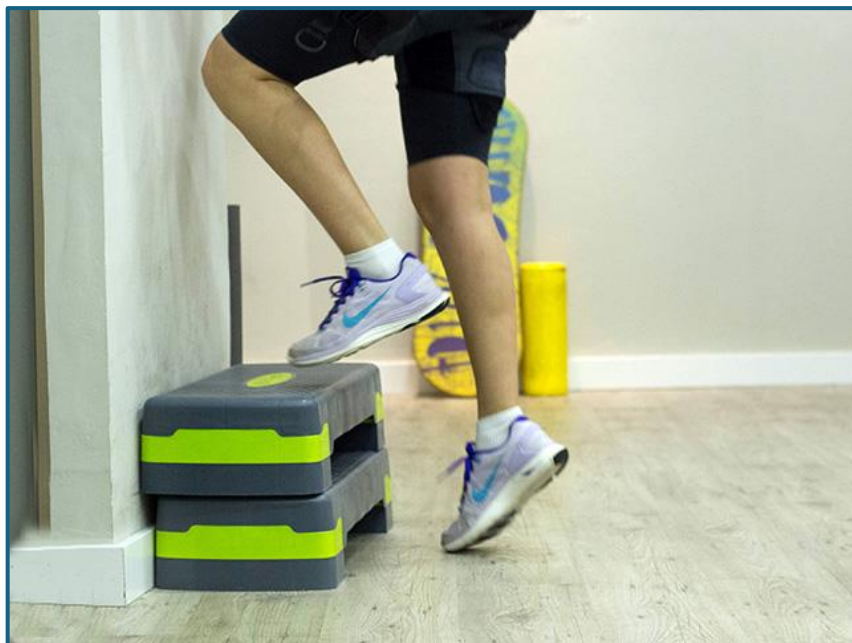


## 4.2 3-minute step test

- Goal: to test the endurance
- Stepping on a bench for the rhythm of a metronome for 3 minutes
- 96 beats per minute
- In time with the beat step one foot up on the bench (1st beat), step up with the second foot (2nd beat), step down with one foot (3rd beat), and step down with the other foot (4th beat)
- Measure heart rate:
  - Before the test
  - Right after the test
  - 2 minutes after the test
- More details: <https://www.topendsports.com/testing/tests/step-ymca.htm>
- Equipments:
  - 30 cms high bench or step
  - metronome
  - stopwatch
  - recording sheets, pen

*Step test*

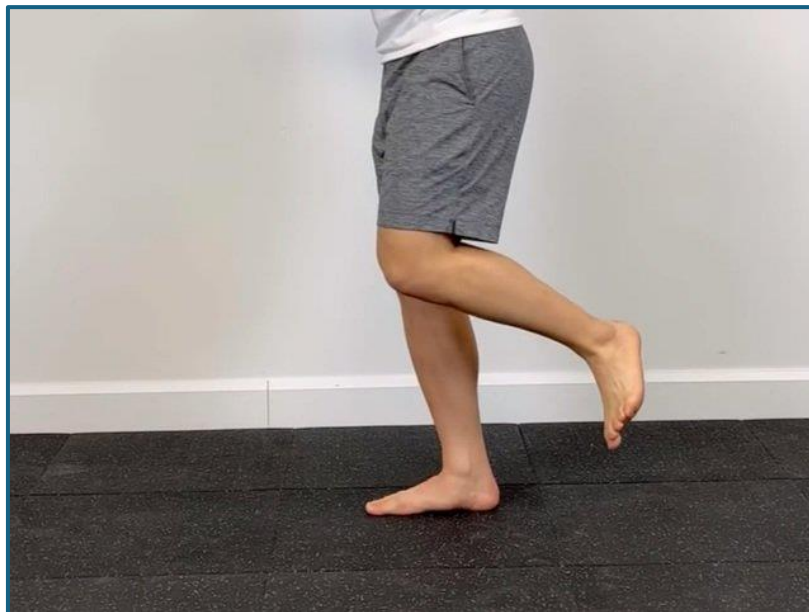
*(Picture 2)*



### 4.3 Single leg stance

- Goal: to test the balance
- to stand on one leg for as long as possible, with 2 minutes top
- Eyes closed
- Bare-footed
- Arms crossed in front of the chest, holding the other forearm
- Standing leg is slightly bended
- The measurement stops when the elevated foot touches the ground or the person hops or otherwise loses their balance position
- Both legs are tested
- Equipments:
  - flat, non-slip surface
  - stopwatch
  - recording sheets, pen

*Single leg test  
(Picture 3)*





## 4.4 Stand and reach flexibility test

- Goal: to test the flexibility of the lower back and hamstring muscles
- Legs are completely closed, feet face forward
- Legs, knees are completely straight
- Standing on a bench, bending and reaching as low as one could
- Bare-footed
- Bouncing and jerking are not allowed
- Measuring the distance with a tape measure above the bench with + cms (e.g. +10 cms if one cannot reach the toes), and with - cms if under the bench (e.g. -10 cms if one can reach below the surface of the bench by 10 cms)
- Equipments:
  - 30 cms high bench or step
  - tape measure
  - recording sheets, pen

### *Stand and reach flexibility test*

*(Picture 4)*

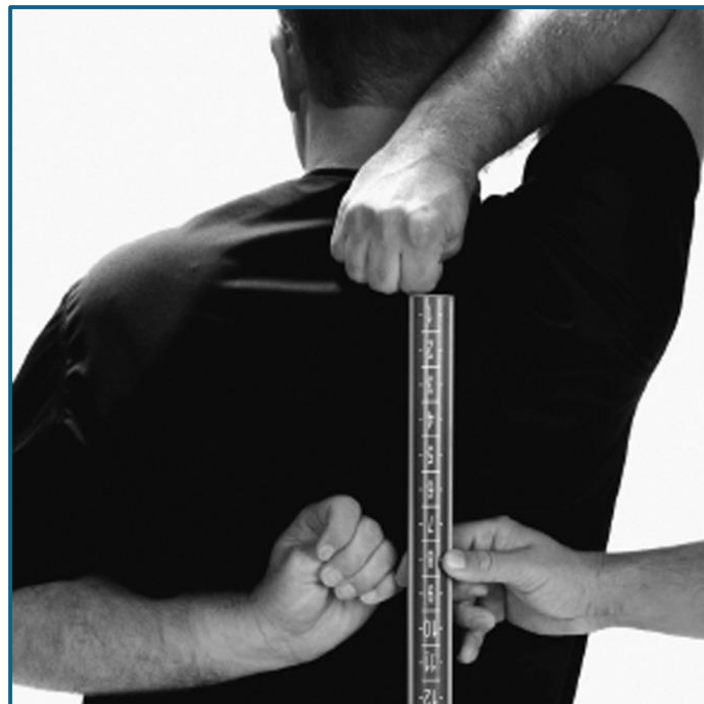


## 4.5 Shoulder mobility

- Goal: to test the mobility of the shoulders
- Fists closed
- One arm up behind the head, the other arm down behind the back
- Reach as close as one could
- Closest point between the fists to be measured
- Both arms are tested:
  - Left: when the left arm is below
  - Right: when the right arm is below
- Equipments:
  - tape measure
  - recording sheets, pen

### *Shoulder mobility test*

*(Picture 5)*



## 5 Body composition

A body composition scale is a type of weighing scale that provides the user with a calculation of their body health. Body composition measurements include body fat, muscle mass, bone mass and metabolic rate. Over time the user can see, in detail, the results of their weight loss or fitness programme. Body composition might be a better indicator for health than BMI, because BMI utilizes only body weight and height and does not take into account overall body composition, including body fat. Using only BMI, muscular individuals may be classified as obese. Consequently, even though it is widely accepted, BMI may actually be a poor indicator for obesity in the adolescent athletic population.

For I.M.Health we used Tanita RD 545 body composition scale, but there are various similar scales available.

The following parameters were measured in the I.M.Health fitness assessment method:

1	Weight (kg)
2	BMI
3	Body Fat (%)
4	Visc Fat
5	Muscle Mass (kg)
6	Muscle Quality
7	Bone Mass (kg)
8	BMR (kcal)
9	Metab Age
10	Body Water (%)
11	Physique Rating
12	Muscle mass - right arm
13	Muscle mass - left arm
14	Muscle mass - right leg
15	Muscle mass - left leg
16	Muscle mass - trunk
17	Muscle quality - right arm
18	Muscle quality - left arm
19	Muscle quality - right leg
20	Muscle quality - left leg
21	Muscle quality - trunk
22	Body fat (%) - right arm
23	Body fat (%) - left arm
24	Body fat (%) - right leg
25	Body fat (%) - left leg
26	Body fat (%) - trunk
27	Heart rate

## 6 Questionnaires

In order to get valid and reliable data about the typical physical activity and quality of life of the subjects, we applied 2 previously validated and accepted methods: LAPAQ and WHOQOL. Both questionnaires were developed as a result of scientific studies and translated to various languages, including the languages of the participating countries of I.M.Health project. Both of them are freely available and downloadable for anyone.

### **LAPAQ**

LASA Physical Activity Questionnaire (LAPAQ) is a questionnaire about physical activity. It asks about how often and for how long the respondents performed each of the following activities in the last two weeks: walking outdoors, biking, gardening, light household activities, heavy household activities and two of their most frequently performed sports activities. For the sports activities, additional questions are asked about sweating. Respondents are also asked if the activity pattern of the previous two weeks was representative for the rest of the year.

### **WHOQOL**

The WHOQOL is a quality of life assessment developed by the WHOQOL Group with fifteen international field centres, simultaneously, in an attempt to develop a quality of life assessment that would be applicable cross-culturally.

WHO defines Quality of Life as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns.

Using this questionnaire before and after an intervention can show how the quality of life of a subject change within the time period of the intervention.

## 7 Fields of application and summary

### **General:**

The tests are well-known, and similar ones have also been used before. Small modifications have been made to increase their efficiency and to provide a more accurate picture. It is important to note that most exercises are timed. With these exercises and body analysis, we get a comprehensive picture of an individual's physical condition and certain motor skills (conditioning abilities such as strength-endurance, endurance, coordination abilities like balance, and flexibility).

We also gain insights into the mental state of the subjects. During the physical exercises, such as the plank, we gather information about endurance and balance, which go beyond just motor skills. Additionally, through questionnaires (based on the responses), we obtain both individual and general "mental" profiles of our target group.

### **Why it's useful:**

- Requires minimal space
- Requires minimal, low cost equipment
- Requires minimal staff
- Large groups can be assessed simultaneously
- Provides a lot of data
- Measures basic abilities (suitable for both average people and athletes)
- No practice is required
- Can be combined with many specialized tests

### **How it's different than other tests:**

- Provides a comprehensive picture with just a few measurements
- Can be successfully completed by anyone (suitable for all)
- Easily adaptable for other age groups (by modifying the time factor)
- These results allow us to conclude other abilities

- Can be applied in almost any developmental program (training, physiotherapy, rehabilitation)
- Provides information about multiple abilities simultaneously
- Offers an overall view of one's condition