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Assessment of Sport Performance: Theoretical Aspects and Practical Indications

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Abstract

Sport evaluation is a fundamental moment in the training process of every athlete, every team and is an indispensable support for the coach. The aims and all the aspects related to the assessment, will be taken into consideration, together to that can have a positive effect on performance, allowing each athlete, team and coach a good workout or match, whatever their competitive level. The approach is argumentative theoretical for the part relating at the training theory. Firstly, summarizing and deducting the scientific idea of research and of apply it in the practices of measurement and evaluation of the sport performance. One of the topics investigated is the relationship between genetic factors and training factors, in determining the performance of an athlete. The athlete's evaluation process should be useful in setting up and controlling the training and providing information to improve sport performance.

Key words: *measurement, test, evaluation, training, performance*

Introduction

Sport evaluation is a fundamental moment in the training process of every athlete, every team and is an indispensable support for the coach. This aspect be part of in the interest of accademic field of the scientific activity, related to the development of theories, techniques and methods for training and for the practice of different sports and motor activities and evaluations of performances (Raiola, D'elia, & Altavilla, 2018). Sport performance is influenced by a series of factors that are variously connected to each other; these factors contribute in determining the performance in different ways, which can be distinguished in quantitative, qualitative and temporal. Sport training is a training process that aims to achieve the highest possible performance under two aspects: quantitative and qualitative (Altavilla & Raiola, 2018). To analyze the factors that determine sport performance, different approaches can be used, with the aim of obtaining all that information to evaluate one or more variables, representative of one or more aspects (qualitative and quantitative) that are, in some way, related at the sport performance (Nughes, Rago, & Raiola, 2017). There is a difference between measuring and evaluating even though these two processes are connected to each other (Safrit, 1990). The term measure indicates the process by which a variable is assigned to a given numeric value; therefore, measuring is merely quantitative, objective and reproducible. Once detected the different variables (measured quantities), through appropriate conversion calculations, it is possible to obtain all the other quantities that are defined derived quantities (Nelson, 1995). This procedure takes the name of analysis, ie mathematical operations that allow to present the data collected in different form (Winter, 1979). With the term to evaluate, however, we mean the procedure that allows to interpret and judge the measured quantity (variable detected). Often, however, the assessment is based on subjective personal experience, on specific knowledge of sports activity and can also be influenced by feelings, opinions and prejudices (Lariviere, Godbout, & Lamontagne, 1991). The evaluation can be defined as a process applied systematically to identify the dimension of the contribution of the various factors related to sport performance. The aim of the athlete's assessment is to set and to control the training or to provide useful information to improve sport performance. All the measurement and evaluation process

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must be supported by scientific research, which aims to establish or verify the knowledge, laws, hypotheses and theories concerning the different aspects of knowledge. Furthermore, scientific research is characterized by rigor, advertising and controllability and uses an experimental design, which also presupposes statistical analysis (Jelaska, Delas Kalinski, & Crnijak, 2017). In this paper, the aims and all the aspects related to the assessment, will be taken into consideration, together to that can have a positive effect on performance, allowing each athlete, team and coach a good workout or match, whatever their competitive level.

Methods

The approach is argumentative theoretical for the part relating at the training theory. Firstly, summarizing and deducting the scientific idea of research and of apply it in the practices of measurement and evaluation of the sport performance.

Performance factors

Sport performance is the result of several factors, some of which are closely related to the athlete, hereditary and acquired (Figure 1); while others act in an integrated way on the athlete and on the team, influencing the training and competition process. One of the topics of interest in sporting activities is the relationship between genetic factors (the talent is partly genetically determined) and training factors, in determining the performance of an athlete (Bouchard, Malina, & Perusse, 1997). According to Sergjienko (2001), the sons of the great athletes have a 50% chance of inheriting notable sportive abilities. A probability that rises up to 75% in the case of children of a couple of great athletes. The genetic patrimony has a fundamental role in the performance, not only the anthropometric, physiological and psychological characteristics can be partly inherited, but also the improvement capacity induced by training (Bouchard, 1986).

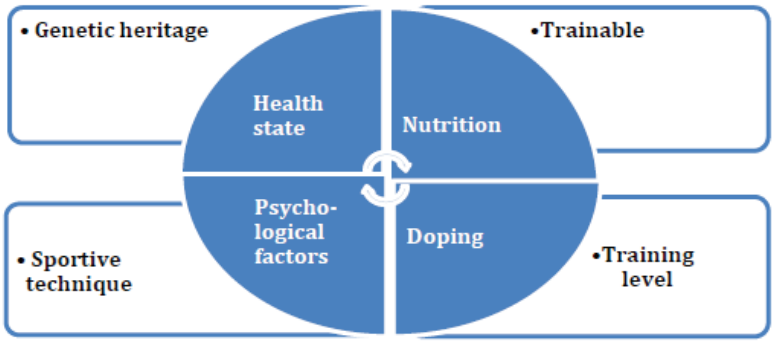

Figure 1. Factors of the sport performance

Another important factor is the ability to support high training loads, which can also be inherited; positively influencing performance, limiting the possibility of incurring injuries and overtraining syndrome. This characteristic, the positive reaction to training, is called trainable, and can be defined as the ability to improve one's motor potential in response to a series of training stimuli (Issurin & Lustig, 2005). The latter is inevitably linked to the sportive technique, which can be defined as the set of all those elements that allow you to adapt the athlete's motor behavior to the contextual situation, between which, also, the error correction made by the coach with verbal rules (Raiola, 2013), in order to obtain the best possible performance (Lees, 2002). Today is consolidated the importance of physical activity to health (Altavilla, D'Elia, & Raiola, 2018a), but also the state of health of the athlete is important and must be investigated through a dual assessment, functional and sportive fitness; while the functional one may depend on the performance, the sportive fitness has the preventive purpose of excluding contraindications to competitive sportive practice, or to establish in the sedentary subjects the exercises devoid of risks (King & Senn, 1996). Related to the state of health there is certainly also nutrition, which must provide, first of all, the energy substances necessary to support the training and the increased food needs of the athlete. Physicality and well-being, contributing to the psychic development (Valentini, Bernardini, Beretta, & Raiola, 2018). Psychological factors are often essential for sportive results (Raglin, 2001). Victory and defeat often depend on the athlete's personality and in some ways on the difficult balance of emotions caused by the psychological relationships established between athletes (own team and opponents), with coaches, referees, managers, journalists, public, family and friends. Finally, even doping can contribute to altering the performance in an illegal manner; in fact, there are athletes that try to improve in artificial way their performances, legal or illegal, healthy or harmful to health (Mazzeo, Altavilla, D'Elia, & Raiola, 2018). Therefore, its role in determining certain performances can not be ignored or underestimated, especially for the impact on athletes' health and on the education of young people. Doping concerns the whole society, it involves not only elite athletes but amateurs too, their friends and relatives (Mazzeo & Raiola, 2018).

Results

The assessment of sport performance can be achieved on the basis of a scale of reference values; this is done considering both the type of measure (test) and the descriptive statistics applied to it; or express the data collected as a percentage of the values obtained from the reference values. The initial assessment serves to identify the characteristics of an athlete or group of athletes, or to define or complete the anthropometric and physical-motor profile of each of them. In this case the tests are used to perform a sort of photograph of the athlete's status and will then help to define the objectives necessary to set up the training program (entry test).

The assessment procedures can be proposed several times during a sportive season, in order to evaluate the effects of training and therefore the achievement of the planned objectives in the short, medium and long term (control and outgoing tests). A further opportunity to evaluate the effects of training is the search of relationships with the performance (Figure 2). It is not correct to think that the performance can only be investigated through one or more tests; in fact, we must not forget that the best test is the match. Sometimes the tests are administered with the purpose of motivating an athlete and in

particular cases, also to satisfy a specific desire of the athlete, whose psychological meaning must be understood and whose importance must never be underestimated. Among the different procedures that can be used there is also the assessment made during the match, in this case the coach collects empirical data visually and then analyzes them only on basis of his experience, to quickly provide feedback to the athletes who will use them in the same match.

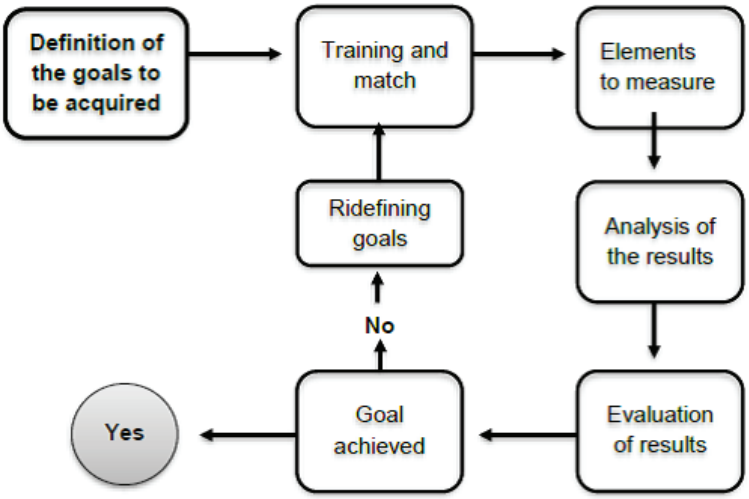

Figure 2. Analysis, measurement and evaluation process

Discussion

In the last years there has been a massive entrance of pervasive computing among sport-related technologies (D'Isanto, Altavilla, & Raiola, 2017); the use of these modern technologies (Gps, slow motion, tracker, accelerometers, bio-sensors) allows to provide real-time experimental data from which to obtain the information useful for improving the sport performance (Altavilla, Mazzeo, D'Elia, & Raiola, 2018b). It is possible to distinguish the tests in general and specific (Dal Monte, 1983). The tests that investigate the physical qualities such as strength, power, endurance, flexibility, etc., are defined general and have the purpose of verifying the acquisition of the minimum necessary levels to proceed in training and for injuries prevention. When a physical quality is insufficient, the appearance of overload or injury pathologies can be observed and the improvement of other physical qualities or sportive technique is often negatively influenced. The specific tests, however, have a high technical value and can be studied from time to time according to the specific needs (specific) of each individual athlete. According to some authors (MacDougall, Wenger, & Green, 1991) this distinction concerns essentially the place where the tests are carried out: in a laboratory, in the gym or on the training field. Today we can consider this distinction obsolete, since many laboratory tests can be carried out in the field and some so-called field tests can be performed in the laboratory. Field tests have the characteristic of not requiring complex and expensive equipment, and therefore of being simple and quick to perform, easily interpretable and economical; some examples: the Cooper test, the Shuttle test or Leger, Jump and reach test, Speed test (35 meters), ecc. These tests are available to everyone, can be proposed at any time and are a very valuable aid in training planning. Regardless of the type, each test must possess three basic requirements (validity, reliability and objectivity) that guarantee the goodness of the information that is collected.

Coaches and anyone involved in training of young athlete and of the teams must have a deep theoretical knowledge of the factors of the sport performance, of the operational tools and the procedures of detection and evaluation, in order to be able to direct all the physical and technical programming, the methodological choices and procedural attentions, while respecting the characteristics of the athletes and of the sport teams. The evaluation of sport performance is a fundamental moment in the training process of every athlete and every team and is an indispensable tool for every coach or sportive operator. The knowledge of the main theoretical aspects, which we have dealt in this study, is necessary to avoid incurring conceptual errors and interpretation. It is important that every sportive technical includes in the training planning moments dedicated to the assessment, which allow him to verify the achievement of the objectives set and also the goodness of his work.

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Conflict of Interest
The authors declare that there are no conflicts of interest.

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