ABSTRACT OF PHD THESIS

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TITLE THESIS:

PHYSICAL TRAINING STRATEGIES FOR THE EVALUATION OF JUNIOR TENNIS PLAYERS

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INTRODUCTION

Explanation for subject preference

I shall start by presenting the explanation for PhD thesis subject preference, a preference derived mainly from an intriguing professional experience consisting in presenting an athlete I have coached for TRF selection activities for 16 years national team, an occasion allowing me to know and consider more seriously with the support of federal trainers the assessment system of juniors' physical training and competition level within the activities I have taken part to, and concurrently, during 2012 and 2013, I have been the coach of the 16 years national team.

This quality professional experience reinforced my belief that the issue of an objective assessment of tennis athletes' potential represents a subject of high importance as it is a recurrent aspect during the entire period of coaching preoccupation.

The thesis is structured in three parts:

Part I: CRITICAL APPROACH OF SPECIAL RELEVANT LITERATURE IN THE FIELD OF PHYSICAL TRAINING ASSESSMENT relying on the consideration of 150 both national and international bibliographical sources, providing in chapter 2 and 11 items and subparagraphs a pertinent presentation of docimology as a science and

its use in sports, mainly in tennis, with a quality approach of "effort peculiarities in tennis", place and relevance of mobility skills within the building of performance ability and the scientific basis of juniors' physical training also and its role in modernizing the performance tennis.

Part II. PRELIMINARY RESEARCH RELATED TO THE ASSESSMENT STRATEGY OF TENNIS ATHLETES' PHYSICAL TRAINING presenting a detailed analysis of TRF testing system in relation with the selectable juniors for the team through activities to which I have taken part directly as I had a forgathered tennis player, so this allowed us to develop a particular assessment alternative and skills in relation with the forming of the experimental team, the control group (U14 and U16 selectable juniors), allowed us to develop a short and long term training program in a preliminary experiment, which, later on, this continued as a didactical experiment.

After considering the preliminary experiment outcome, we present the premises for the future research. Though the special relevant literature provides with several assessment methods of the physical training, the common note of the various alternatives consists of the use of tests grouped in two large investigation categories of the level reached in athletic and competition training.

- Tests of overall movement mobility;
- Tests of mobility peculiar for the tennis game;

Their unity is compulsory in developing praxeological diagnosis and prognosis. The overall movement mobility tests are derived, almost entirely, from the F.I.E.P. test (International Federation of Physical Education), also called "Standard Fitness Test".

Assessment tests of juniors' physical training forgathered in the team:

"OFF COURT" Tests

- VAMEVAL (Assessment of the aerobic power – VAM / vVO_2max);
- 6 x 20 + 20 m (Assessment of anaerobic-lactacyd capacity);
- SPRINT: 10 / 20 m (Speed assessment);
- Squat Jump (Assessment of the explosive strength);
- Counter Movement Jump (Assessment of the elastic explosive strength);
- FREE JUMP (Assessment of the explosive strength);
- CRUNCHES (Assessment of the abdominal strength);
- DYNAMOMETER (Assessment of the arms strength);

- DYNAMOMETER (Assessment of the lumbar and dorsal muscular strength);

- T REACTION (Assessment of the speed of response);

- THROWING THE MEDICINE BALL weighing 3 kilos with two hands: forward over the head, forehand, backhand);

- PLYOMETRIC JUMPS (Assessment of the strength in feet endurance);

- ONE-LEG STABILITY TEST (Assessment of stability on one foot);

- MOBILITY (Assessment of mobility rate for the following articulations: back, shoulder, hip joint).

"ON COURT" Tests

- FAN (Assessment of specific movement speed on the field);

- LATERAL RUN (Assessment of movement speed in lateral run);

- HEXAGON TEST (Assessment of agility).

Part III. RESEARCH RELATED TO ASSESSMENT STRATEGIES OF JUNIOR TENNIS PLAYERS' PHYSICAL TRAINING represents the basic part of the thesis where we present, besides the specific assessment in tennis play, all data concerning the organization of the didactic experiment (premises, subjects and methods, periods and proper performance of the research, a short presentation of the working means involved).

It is presented the data of the measurements for the established tests and the data obtained during the supplementary tests relevant for the peculiar mobility capacities, as well as the data gathered during these specific tests with fatigue involved.

Objectives

- Achieving a required working tool for later work with juniors in an accessible alternative for the tennis coach.

- Achieving certain scientific arguments for developing a unified national assessment system of juniors' physical training potential established within the departments (with no expertise staff, laboratories and specific technologies).

- Testing enhancement programs of juniors' physical training laying stress on developing specific mobility capacities and building a special endurance background to fatigue and stress during competition.

- Ascertaining conclusions for later professional activity and for elaborating the scientific work.

Study and research hypothesis

- By motivated modifications of the testing systems used by TRF, we may draw a unified assessment system of tennis players' mobility capacities and, implicitly, a didactic projection system for tennis players' physical training enhancement.

- A scientific assessment system can be applied for tennis clubs and departments, thus contributing to improve the overall quality of training programs, in particular the physical training improvement of junior tennis players.

- The great performance is achievable within fatigue conditions, and the specific assessment during the said conditions may lead to better understand the physiological layers to enhance the tennis players' effort capacity.

Subjects, methods, organization

Subjects

In order to test the specific system for physical capacity assessment and a peculiar physical training program, we established a test specimen of 12 players registered with the tennis department of AS SĂNĂTATEA ORADEA, representing the testing group. The 12 athletes have been trained by three coaches of the department (6 of them from my own team and 6 other from the two coaches we have established physical training and shared testing programs with).

Considering to complete the control group, we have used as referring system two selectable juniors groups for U14 (16 tennis players) and U16 (12 tennis players where we had a players involved within the testing group) national team. We ascertain that we have taken part to data testing and processing by the federal coaches, having their permission to use it in our research. The tennis players are registered with departments country wide with various training programs at their clubs and short periods of centralized training.

Duration of research

The didactic experiment and peculiar assessments have been carried out during 4 school years (2209 – 2013) of which the period between 2010 and 2013 represents the mentioned research.

The testing group started training in September – October 2009, including athletes aged of 13 – 14 (the initial testing age), the intermediate

testing was carried out in September – October 2010, and when aged of 16, the final tests were established in September – October 2013.

The U14 control group was tested at TRF in 2012, we using the final referring data, and the U16 group (also having an athlete from the testing group) had the initial testing in September – October 2009 and intermediate in September – October 2010, these being used within the control system (reference).

Course of the research

The research continued during 2010 – 2013 keeping the subjects in the testing group and the assessment procedures in the preliminary research and TRF tests.

After gathering the intermediate data (after the preliminary test) we proceed to analyze the individual physical training evolution of the 12 subjects, the markers were divided into two main categories:

- The markers of accumulations during the physical training confirming the good quality of the used working means requiring only small adjustments and corrections (especially as the volume and intensity are concerned).

- The markers of a weak evolution or unsatisfactory requiring the reconsideration of working quality and volume of means used during the preliminary research.

Following the analysis of the preliminary data all those means that failed to achieve the satisfying accumulation have been reconsidered for their moving mobility, the training schedule were improved by adapting certain more effective means and by extending the volume.

During 2010 – 2013 we proceeded to the annual investigation of the physical training level (by adapting certain corrections in the training, as a consequence of markers evolution analysis of individual movement mobility capacities).

The final data of the test are shown in table no. 17, and this data allowed us to perform final analysis and appraisal concerning the working means and at the same time the appraisal of the assessment systems used during the entire test; starting from TRF scales and marks (table no. 6).

In the next chapter, we proceeded with the intermediary and final data analysis and interpretation, referring to:

- TRF data concerning the selectable juniors' potential (U14 – U16) presented in tables no. 23 and 25, as well as in table no. 6.

- The data recorded during the initial and intermediary measurements carried out within the testing group, the table no. 14, 15 and 16.

Special assessment targeting the peculiar movement mobility capacity markers

- Specific effort tests "with" and "without" racket

The subjects in the testing group have been tested by special supplementary tests as well, derived from TRF testing system performed by using a technique implying holding the racket in the mastering hand, a measure meant to converge as much as possible the test towards the peculiarity and the concreteness of tennis play.

We considered the following tests:

- 6 x 20 + 20 m (Assessment of the lactacyd – anaerobic capacity) with and without racket touching a medicine ball.
- Hexagon test (Assessment of the speed and agility with and without racket).
- Fan test (The movement speed specific to the game and coordination by imitating certain racket strikes – or gathering and placing 5 tennis balls in fixed points, the movement being performed forward and backward).
- Lateral run (Assessment of the movement speed, stop and direction changing, with and without the racket).

We should point out that the data gathered in performing the tests with the racket has been referred to the data gathered in performing the tests "without" the racket, mainly the data gathered during the final test of the didactic experiment, 2009 – 2013. Considering these measurements we marked out the relevance and the usefulness of the supplementary measurements (table no. 18 and 19).

Assessment involving fatigue

A different measurements category we consider as required and profoundly significant in knowing the sport and competition physical training level includes the possibility of carrying out several simple and expedient to assess the movement mobility during fatigue (after "a harsh training" of physical and/or technique training).

For appraising the implicit competition and physical training level we used the following tests in the category of those expressing the most veridical the peculiarity of effort in tennis:

- Fan
- Hexagon
- Lateral run

- Ruler test
- Service in area

The data has been gathered 5 minutes after the physical training practices with large volume and high intensity proceeding with the comparison of the outcome obtained from the five tests during recovery.

The measurements carried out for one month involving all subjects in the testing group. The data are shown in the table no. 20, in the next chapter, where it is shown and globally analyzed (averages of the group) and individually (corroborated and with the outcome obtained by the subjects in the official competition system for juniors).

Conclusions

Methodic and Methodological Conclusions

The data obtained during the final measurements of the experiment concerning the use of a system including assessment tests related to the physical training level of U14 – U16 juniors fully confirms the working hypothesis regarding the usefulness of a proper measuring and appraisal system in compliance with the patterns issued by TRF and by several authors in the consulted bibliography by adapting these patterns to the concrete working conditions within the tennis department for juniors and to the athletes' age and individual specific peculiarities.

The directions of TRF allowed us to project a system of assessment tests of the physical training which was confirmed as useful and effective in knowing and guiding the juniors' training process by programs that proved their effectiveness.

- While adjusting the assessment system, we began from the hypothesis of certain corrections and approaches peculiar to the tennis game that were confirmed to be necessary and useful, both by applying several assessment involving fatigue and by carrying out several assessments by tests involving the racket hold by the mastering hand within the tests of 20 m flat sprint, 6 x 20 + 20, Hexagon, Fan and lateral run, where the modification performed lead to the gathering of data clearly weaker, nevertheless more veridical.

Likewise, we point out the usefulness established at the end of the investigations, both in relation with the tests system targeting the assessment of the general and peculiar movement mobility capacity, and several tools designed for research which proved to be useful as well: the patterns of physical training and goals projected and achieved, entirely or partially, but extremely useful in issuing the physical training programs (chapter 6.1.).

Conclusions obtained from the assessment study

- The outcome statistical analysis and treatment outline, besides the progress achieved within the overall physical training and several movement mobility capacities requiring further on an approach by means of special training, more strictly elaborated by volume and higher intensity. Therefore we point the movement speed, the endurance and the mobility that will be carefully monitored during the athletes' further on training.

- Both the tests and measurements carrying out and the final outcome confirmed the usefulness and the effectiveness of all tests used within the initial and intermediate assessments for issuing diagnosis, prognosis and corrections required to project new training programs in line with actual and initial tests.

- By testing measurements (with racket), we practically confirmed the need of supplementary and complementary tests within the assessment tests system, these being used whenever they are required.

The same modest personal contribution to fathom the assessment issue leads us to the research of measuring the movement mobility during fatigue and we ascertained statistically the independence between the competition capacity and the small differences between the gathered movement mobility values during recovery and those gathered during fatigue. Thus we established the possibility to objectively assess the physical shape – a very useful tool in coaching activity.