ANALYSIS OF THE TRAINING LOADS OF RECREATIONAL TRACK AND FIELD ATHLETES WHO HAVE PARTICIPATED IN MASS START COMPETITIONS DURING THE COVID-19 PANDEMIC

Iveta Bonova

National Sports Academy "Vassil Levski", Sofia, Bulgaria, iveta_ivanova1980@abv.bg

Abstract: Introduction. The long-term benefits from recreational sports practice have been well researched. Nowadays, the COVID-19 pandemic has brought new, unexpected challenges, which makes it particularly important for professional athletes to be able to consider physical activity and sport from a different perspective and to reorientate their goals in sports accordingly. In professional sport, athletes strive to achieve top results, which requires extreme physical and mental effort, often realized on the border between illness and health. After the end of their racing career, many athletes stop sports practice altogether.

Purpose. The present study aimed to explore the transition from a professional competitive career to recreational sports practice as represented by the daily life of ex-runners in middle and long distances. To achieve this goal, the author has analyzed the running loads of runners who have gone past the phase of top and stable sports achievements and have reoriented themselves to the field of sports for recreation.

Methodology. For the purpose of this research, Polar Vantage V heart rate monitors were used. Data collected over a 5-month period (October 2020 – February 2021) were analysed – for the group as a whole and for each subject individually. The following parameters of the training loads were examined: total kilometres per month and for 5 months, number of training sessions per month and for 5 months, average heart rate for the best training session of the month, and zones of intensity (Z5-Z1), presented as a percentage distribution of training load time per month and for 5 months.

Results. This study included 10 recreational runners (5 men and 5 women), of mean age 36.4 (SD± 4.03), mean weight 63 kg (SD±8.7), mean BMI 20.7 (SD±1.7), mean body fat ratio % 12,7 (SD±4.3). All data were analyzed with the SPSS 26 Statistical program; the statistical significance level was set to $p < 0.05$.

Conclusion. It has been found that recreational runners maintain their lifestyle in the conditions of the COVID-19 pandemic. Recreational runners do not change their habits and perform regularly the planned training session, as reported in this article. They keep taking part in all the planned starts from the chain of mass events (Sofia Marathon, Balkan Marathon Championship – Kyustendil, national championships, cross country, Run – Bulgaria events). Therefore, reorientation to recreational sports may allow famous athletes to stay in sports actively and to maintain good physical and mental health and social well-being.

Keywords: recreational runners, training load, mass starts competition, COVID-19.

1. INTRODUCTION

The long-term benefits from recreational sports practice have been well researched. Nowadays, considering the new challenges brought about by the COVID-19 pandemic, it is particularly important for professional athletes to be able to consider physical activity and sport from a different perspective and to reorientate their goals in sports accordingly. In professional sport, athletes strive to achieve top results, which requires extreme physical and mental effort, often realized on the border between illness and health. This fact brings to the fore the application of optimal training loads, which have the best effect on human health.

Optimal loads are considered in relation to the sustainable manifestations of athletes' performance or ability to maintain their state of training over time. Optimal loads are always individual, because they are based on the individuals' tolerance to different intensity loads and current state of training.

Long-distance running is considered to be among the cyclic physical exercises that do not require maximum effort and maximum expenditure of the energy reserves in the body. Most long-distance running training sessions transition to tempo running loads, whereby the aim is to maintain the running speed for more than half of the running distance. The individual training sessions are performed according to a preliminary training program, which should be prepared on the basis of the principles of undulation and complexity of the training loads. This requires the application of running loads with different intensities on different days. The running loads are realized by working in different training zones of intensity.

In the present study, the training of recreational runners included: training sessions for the development of maximum speed and power, interval running, pace running, long running. The running loads were supplemented with two core stability and mobility training sessions. Heart rate monitors produced by Polar were used to control the sports training. The heart rate (HR) intensity training zones provide an answer to the question of the price the body "pays"

when performing a certain training load. The zones are presented as a percentage of the maximum heart rate and determine which zone the running load falls into. Thus, it is checked whether the real effort corresponds to the planned one and what are the changes caused by a specific external training load on the internal reaction of the athletes' body.

Heart rate (HR) training zones allow quick analysis of the running training, which can be accompanied by control. If necessary, the intensity or volume of running loads can be reduced or increased. More recovery exercises can be given, if needed. This kind of analysis of the training sessions is preferred by recreational runners because it is non-invasive and does not require laboratory conditions (Olli-Pekka Nuuttila et al., 2021). The only technical device they need to have is a heart rate monitor and a chest strap to it.

The problem of training loads and their impact on athletes' body has always been relevant. Athletics coaches often apply the same training methodology within a group and then are surprised by the variation in the level of different athletes' performance. This happens because adaptation to training loads is primarily an individual process that can be considered in two aspects:

1) as an individual process, adaptation to training stimuli depends on athletes' genetic potential, sports experience, speed of recovery processes after training loads, diet, quality of sleep and current health status;

2) in terms of orientation of the training influences towards the development of certain qualities, adaptation is viewed as prognosticated and related to the expected training effects as a result of the purposeful development of the physical qualities and functional possibilities.

In the present paper, the method of analysis of specific running indicators has been used to analyze the training loads. The analysis illustrates the external training load, including the means, volume, intensity, and number of training sessions as well as the internal side of the load – average HR, maximum HR, ratio of HR to running speed (running index, RI), HR zones, and perception of effort (RPE). The specific parameters were analyzed to a great extent by the Polar software program, which showed the dynamics of the studied indicators. However, what is of major importance is the ability of each sports pedagogue to process the presented information and to correctly construct (implement) the next training loads.

The hypothesis of the study is related to the expected stable performance of the specific running indicators studied and their impact on the healthy lifestyle of recreational runners.

The purpose of the present study was to explore the transition from a professional competitive career to recreational sport as represented by the daily life of ex-runners in middle and long distances. To achieve this goal, the author has analyzed the running loads of runners who have gone past the phase of top and stable sports achievements and have reoriented themselves to the field of sports for recreation.

2. MATERIALS AND METHODS

Participants. This study included 10 recreational runners (5 men and 5 woman), of mean age 36.4 (SD± 4.03), mean weight 63 kg (SD±8.7), mean BMI 20.7 (SD±1.7), and mean body fat ratio % 12.7 (SD±4.3). The athletes who were included in the monitoring of the training loads were former athletes from the Bulgarian national team in middle and long distance running. They are representatives of various sports clubs from different cities and currently participate in national competitions focused on running for recreation. They have an average sports experience of 17 years (± 2 years); some of them work as coaches of adolescent athletes. All recreational runners signed an informed consent for voluntary participation in the study, which was carried out according to the guidelines of the Declaration of Helsinki for Human Research (WMA, 2013).

Mass start competition. The training running loads were conducted with the aim of preparing the athletes for participation in a series of long-distance mass running events (10 km, 21 km, 42 km). Recreational runners participated in mixed mass events, with a common start for professional athletes and those running for health, making their start from special positioning areas. A new running series in Bulgaria, uniting recreational and professional runners, was specially created in 2018 under the name "Run Bulgaria". This mass event was established by the Bulgarian Athletics Federation and has been held in cities across the country.

Measurements. Height measurement was performed with a height meter with an accuracy of 1 cm. The analysis of body composition was performed with an IN Body 230 apparatus, Korea. All specific running indicators and criteria for the efficiency of the running load and the subsequent recovery processes were recorded using the pulsometry method. For this purpose, Polar heart rate monitors, model Vantage V, 2020, were used. The analyzed data has been collected over a 5-month period (October 2020 – February 2021). The following parameters of external and internal training load were studied: total kilometres per month and 5 months; number of training sessions per month and 5 months, average heart rate (aver. HR) of the best training session of the month; intensity zones (Z5-Z1) presented as the dominant time distribution of training loads per month and 5 months, running index (RI). The indicator RI is presented for each individual subject, while the others are presented for the group as a whole.

Period of investigation. The study was conducted from October 2020 to February 2021. From November 5th to December 20th, a partial lockdown was imposed in Bulgaria. Despite the highly unfavourable situation, recreational runners managed to carry on training (in natural conditions, outdoors), which is evident from the recorded training sessions by the Polar software system. During this period, running was only allowed in parks and mountains. Evidently, recreational runners took advantage of these opportunities, as confirmed below in the analysis of the data regarding the number of training sessions conducted and the total kilometres run. The men running for health continued their usual training regiment (in terms of volume, intensity and number of training sessions), whereas there was a decrease in the number of the training sessions of the women running for health. The latter could be due to the fact that during the partial lockdown kindergartens and schools were closed, which necessitated additional commitments from women with children.

Statistics. We performed a Shapiro test to determine the normality of the sample. We found out normal distribution of data with respect to the studied parameters. There were two exceptions: the indicator of total kilometers run in the month of February and the indicator of intensity Heart ratio in the training zone Z-5 (Z5). The latter carries information about the percentage distribution of the training load in the zone of intensity Z5; the indicator reveals the percentage of the total training time performed in Z5. Here, the percentage distribution in the studied zones of intensity refers to the 5-month training (October-February). For these two indicators, the Kolmogorov-Smirnov test was applied for statistical reliability of the data. For all other studied parameters Student's t-criteria was used to investigate the statistical significance, with accepted level $p = 0.05$.

3. RESULTS

The results show that the largest volume of the training load (kilometres run) was performed in the HR zone of intensity Z4 (27.6%). The second place belongs to the Z3 zone (21.3%). The third place, with almost equal distribution of kilometers run, belongs to the zones Z5 and Z2 (20.5%; 20%, respectively). The smallest share of the running training of recreational runners belongs to the training zone Z1 (10.6%).

Based on the results of the monitored recreational runners, it can be concluded that the highest share of running training was realized in the HR zone Z4. Therefore, the HR zone of intensity Z4 can be considered as dominant in the training process.

4. DISCUSSION

The analysis of the training loads has been conducted in order to determine the optimal training loads that lead to sustainable adaptation and a healthy lifestyle. Establishing the effect of the running loads on recreational runners' body is an important aspect of their preparation, as it provides prevention from symptoms of overtraining and the associated negative consequences.

Dissociation between external and internal load units may be indicative of the state of fatigue of an athlete (Halson, Sh., 2014).

Training programs for recreational runners who are transitioning from active competitive activity to recreational sports should be implemented under continuous monitoring by coaches. However, training is often defined as "know-how" and it is not a common practice for athletes to reveal details regarding their training.

The issue of the impact of different types of physical activity on the body of those who practice sport for health and fitness is becoming more and more widespread. A new study by Collins, K et al. 2021, has examined the impact of different types of exercise and their effect on health and quality of life. The authors have used a wide range of research methods which reveal the relationship between different types of training loads and their impact on athletes. The study has found aerobic exercise or combined aerobic and strength exercise as the most effective type of training.

Thus, experienced recreational runners typically train on a separate basis on different training days, and their goal is to achieve a healthy training effect, which is subject to continuous monitoring.

In an experimental study by a team of scholars from Finland, daily prescriptions for endurance training were provided. The experiment was conducted with three groups of recreational runners: a group training according to a program, a training group with monitoring of ANS (autonomic nervous system) and a control group. The group training according to a program conducted six training sessions: two high-intensity and four low-intensity ones, each with a duration of 40 minutes. The results in the ANS monitoring training group were based on the individual changes in the ANS recording measured in the morning before getting up.

The increase in HRV (heart rate variability) was an indicator suggesting that the body had recovered and could train intensely. When HRV was reduced for two consecutive days below the reference values, low-intensity training or rest was prescribed. At the end of the experiment, it was found that the best positive adaptive changes occurred in

the group that trained with ANS monitoring. This group improved their running speed in a running test by 1 km / h compared to output data of the group (Kiviniemi et al. 2007).

In the analysis of training running loads, the formula of Banister et al, 1986, can be used. The latter determines the training impulse (TRIMP), which carries information about the amount of training as cited in (Banister et al., 1986).

An authors' team from the Centre for Research in Sport (Lyon) conducted a pilot study to quantify training load, applying the following formula, which was developed using HRV records at different time periods (5 minutes before training load, 5 minutes after training load and 30 minutes after training load). The study confirmed that for a training load at a maximum running speed ($S_{100\%}$) there was statistical data reliability and a high correlation between HRV measured 5 minutes before exercise and HRV measured 30 minutes after exercise. The authors analyzed the training load by three methods – the TRIMP method, the RPE method, and the TL_{HRV} method, and recommended the third method as the most effective one (Saboul, D. et al., 2015).

World athletics pays special attention to running for health, as it is of great importance for the promotion of athletics around the world. Hundreds of millions of people on all continents are running for health. Following the expansion of the COVID-19 pandemic, World Athletics has created a special section on its official website www.worldathletics.org, aimed at amateur runners with professional advice on training, nutrition, recovery, injury, etc., which can be useful for runners at every level. Usually, these running tips and articles are written by former and current elite athletes with valuable experience and expertise in middle and long distance running.

5. CONCLUSION

The present study has determined that recreational runners are characterized by established habits and persistent routine, leading to regular sports activity. Evidently, the partial and complete lockdown due to COVID-19 affects recreational runners to a lesser extent, as they find training tracks outside urbanized running areas and do not change significantly their established motor habits. It should be noted, however, that adolescent athletes are more at risk of being negatively affected by the pandemic, as they do not yet have established habits for regular sports activities.

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