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Relationship Between Training Volume, Mood States and Perceived Effort in Adults

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Abstract

The aim of this study was to evaluate changes and relationships between mood states, training volume and perception of effort in adults during an eight-week strength-training programme. Twenty-one male adults (age 30.19 ± 8.65 years; height 173.56 ± 7 cm; weight 78.07 ± 10.82 kg) took part in the study. Quantitative monitoring of the training volume, the profile of mood states (POMS) and rate of perceived exertion (RPE) were self-evaluated weekly, i.e. eight times in total. Analysis showed that a well-planned training volume resulted in positive changes of POMS over the eight weeks ($p < .05$); there was a decrease in the rate of depression and fatigue ($p < .05$). Positive correlations between evolution of POMS and evolution of volume training were observed ($p < .05$). In summary, changes in RPE were correlated with changes in POMS over the training programme. Thus, the use of psychological indicators can contribute to a better planning of training volume in adults. These findings may be helpful to coaches in prescribing an optimal training volume for adults.

Keywords: Mood States, Perception, Training, Physical Activity.

An optimal resistance training programme can assist in attaining goals related to health, fitness and physical performance (ACSM, 2009). The correct manipulation of programme variables (choice of resistance, exercise selection and order, number of sets and repetitions, frequency and rest period length) can increase the ability to obtain a higher level of muscular fitness (ACSM, 2009; Orquín, Torres-Luque, y Ponce de León, 2009), better functional parameters (Kraemer y Ratamess, 2004) and various therapeutic effects (Ewart, 1989).

In order to practice sport, a training prescription is recommended. It is generally believed that an increase in training volume can result in improvements in sport performance and physical well-being (Borresen y Lambert, 2009). Although this fact is widely accepted in sport performance, in a training programme that focuses on health and well-being, it is necessary to control increases in training volume, as an increase in intensity or frequency may also increase the likelihood of injury and symptoms of overtraining in this population (Borresen y Lambert, 2009). Changes in training volume may adversely affect adults. The type of training not only has implications at a physical level, but also at a psychological level, as for example, mood state can be influenced by the type of training performed (Torres-Luque et al., 2013). Considering that the psychological changes in sport can be more consistent than physiological indicators (Bonete, Moya, y Suay, 2009; Le Unes y Burger, 2000; Verde, Thomas, y Sherpard, 1992), it is necessary to monitor these changes as psychological indicators are a good alternative. The use of questionnaires and actigraphy to assess psychological effects and exercise is popular, as the administration of these assessment methods is easy, they are cost effective and do not impede training (Hernández, 2008; Suay, Ricarte, y Salvador, 1998).

Mood state evaluation with the *Profile of Mood States (POMS)* adapted by Balaguer, Fuentes, Meliá, García-Mérita, and Pons (1995) is frequently used to identify the psychological effects of training and competition in athletes. The POMS consists of a list of 29 adjectives through which a general index of alteration in the mood state of a person and five partial measures are obtained. The measures include four negative affect scales: depression (D), anger (A), tension (T), fatigue (F) and a positive affect scale: vigour (V). This is the most used instrument to measure this variable in Spanish adult athletes (Andrade, Arce, y Seoane, 2000; de la Vega et al., 2008) and in teenage athletes (Andrade, Arce, Armental, Rodríguez, y de Francisco, 2008; Hernández, Torres-Luque, y Olmedilla, 2009). In studies with athletes,

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this scale has been very useful when applied periodically, as it allows researchers to examine the relationship between athletes' mood states and their current situation (de la Vega, Ruiz, García-Más, Balagué, Olmedilla, y del Valle, 2008; Garatachea, Hernández-García, Villaverde-Gutiérrez, González-Gallego, y Torres-Luque, 2012; Hernández, Torres-Luque, y Olmedilla, 2009; Kumae, Suzukawa, y Ishii, 2012). These questionnaires are more commonly used with athletes than with non-athletes. However, through the use of questionnaires, it has been seen that subjects performing regular physical activity also show benefits, among which the subjective feeling of well-being and better mood states have been observed (O'Neil, Dunn, y Martinswen, 2000).

The influence of mood states has been successfully used with injured people (Abenza, Olmedilla, Ortega, y Esparza, 2009; Abenza, Olmedilla, Ortega, y García-Más, 2010), in physical activity programmes in an aquatic environment for pregnant women (Torres-Luque, Torres-Luque, Zagalaz, y Villaverde-Gutiérrez, 2010) or in long-term yoga training (Yoshihara, Hiramoto, Sudo, y Kubo, 2011). For example, in the work by Torres-Luque et al. (2010) a six-week physical activity programme in an aquatic environment for pregnant women showed a decrease in the tension and depression factors in the second part of the physical activity programme (the last three weeks of the study). In the same study, fatigue evolved steadily throughout the intervention period and decreased significantly at the end of the programme. Yoshihara et al. (2011) suggest that long-term yoga training can reduce the scores related to mental health indicators such as self-rated anxiety, anger and fatigue.

At the same time, effort perception through rate of perceived exertion (RPE) (Borg, 1998) is frequently used in training programmes. RPE is based on the understanding that athletes can inherently monitor the physiological stress their bodies experience during exercise and thus, are able to adjust their training intensity using their own perceptions of effort (Robinson, Robinson, Hume, y Hopkins, 1991). Compared with heart rate and blood lactate concentration, the RPE scale has also been shown to provide a valid measurement of exercise intensity (Borresen y Lambert, 2009; Foster, 1998). Accordingly, the use of a session-RPE method for perceived changes in training volume and strain during training could provide additional information on the athletes' status, allowing coaches to prevent eventual states of overreaching or overtraining (Elloumi, Makni, Moalla, Bouaziz, Tabka, Lac, y Chamari, 2012).

There is a lot of information on the effect of training volume on the psychological aspects of sport training populations. However, this is less investigated in populations that are not intended for athletic performance. Such information would be of great practical importance for fitness trainers working with non-athletes, e.g. in a fitness club setting focusing on strength training. Consequently, further investigations on the effect of training volume and psychological characteristics in adults is necessary. The aim of this study was to carry out a descriptive analysis of the changes in mood states and perception of effort during eight weeks of a training programme for adults and assess whether there are relationships between the mood state values of training volume and perception of effort obtained during the training programme.

Method

Participants

The participants were 21 males (age 30.19 ± 8.65 years; height 173.56±7 cm; weight 78.07±10.82 kg). All participants received detailed information on the purpose of the study and provided written informed consent. The following inclusion criteria were applied to participants: (i) age > 20 years old and < 40 years old; (ii) male and (iii) participants should be novice in strength training, e.g. untrained individuals with no resistance training or who had not trained for several years (ACSM, 2002). The following exclusion criteria were applied: (i) having an illness or injury and (ii) having taken medication (including vitamins or protein supplements, etc.) in the two months prior to the study. All participants were at a fitness club and participated voluntarily.

Measures

An abbreviated form of the original version of the POMS (McNair, Lorr, y Droppleman, 1992), validated in Spanish by Fuentes, Balaguer, Meliá, and García-Mérita (1995), was used in this study. The questionnaire presents a Cronbach's alpha ranging from .70 to .83. It is a 29-item adjective checklist-type questionnaire, with responses made on a Likert-type scale with values ranging from 0 (never) to 4 (always). The participants completed the questionnaire once a week (on a Sunday afternoon and in a relaxed environment) during the eight weeks of training.

Perceived exertion was obtained using the Borg category (with 6 = no exertion at all and 20 = maximal exertion) RPE scale (Borg, 1998; Borg y Kaijser, 2006). The scale was explained and practised before the training programme. The subjects were asked 'How hard do you feel the exercise was?' and they answered at the end of the training session (within 30 min of the end of the session). The Spanish version is the PSE (*Percepción Subjetiva de Esfuerzo*) previously used in other studies (Cuadrado-Reyes, Chirosa-Ríos, Chirosa-Ríos, Martín-Tamayo, y Aguilar-Martínez, 2012; Calahorro-Cañada, Torres-Luque, y Lara-Sánchez, 2014).

Procedures

Participants took part in an eight-week supervised programme. Training was conducted three times a week (Monday, Wednesday and Friday). Each session lasted from 30 to 45 minutes according to planning. The training included a dynamic warm-up and strength training (lower extremity, upper extremity and core). The strength training consisted of a circuit of overcharges, at 50–60%

of one-repetition maximum (1RM), between 2 and 4 sets of 15 repetitions per exercise and 30 to 40 s rest periods between sets. A 1RM estimate was carried out according to the protocol established in Orquín, Torres-Luque, and Ponce de León (2009). All the principles recommended by ACSM (2009) were taken into consideration. The training volume increased after week two and increased again in weeks five and six. In this way, the training always started with an aerobic 10-minute warm-up, joint mobility and active static stretching. After that, the circuit of overcharges comprised: on Monday of horizontal bench press, incline leg press, side shoulder raising and biceps curl ups, finishing with crunches, isometric side support and the bird-dog exercise. On Wednesdays, they performed lat pull down, incline leg press, side raisings, leg curls and rope pull down extensions, always finishing with the crunches, the isometric side support and the bird-dog exercise. To finish their weekly programme, on Friday they performed horizontal bench press, incline leg press, lat pull down, elbow extensions with high pulley, standing biceps curl with 'Z' bar, leg curls, lateral shoulder raisings, workout of the rectus abdominals, obliques and lumbar muscles.

During the eight weeks of training, the participants were self-evaluated for POMS and RPE (Table 1).

Table 1
Testing Schedule

Measures	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Training Volume	X	X	X	X	X	X	X	X
POMS	X	X	X	X	X	X	X	X
RPE	X	X	X	X	X	X	X	X

Note: POMS: Profile of Mood States; RPE: Rate of Perceived Exertion.

Data Analysis

All data were analysed with the statistical package IBM SPSS Statistics 19 (SPSS, Chicago, USA). The means and standard deviations of each of the variables by week were calculated. To test the effect of time on the variables of the study, an analysis of variance (ANOVA) with RPE as the dependent variable was carried out during the eight weeks, reporting on the effect size (η^2) and the statistical power (1-β). Furthermore, a linear mixed model analysis was performed to analyse the existing relationship between the training volume, RPE and POMS. The identity scale linear mixed mode was employed, using the Akaike Information Criterion (AIC), as this analysis allows the analysis of correlated variability.

Results

Training Volume

The evolution of the training programme is shown in Table 2.

Table 2
Weekly Training Volume (n = 21)

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Volume (s)	2100	2100	2400	2400	2700	2700	2400	2400

Rate of Perceived Exertion (RPE)

The average RPE of the participants varied during the training programme $F(7,13) = 7.098$ $p = .000$, $\eta^2 = .262$, 1-β = .992. As observed in Table 3, according to the post hoc Bonferroni test, there was a statistically significant decrease ($p = .000$) from initial value (week 1) to final value (week 8) and between week 3 vs week 5, week 4 vs week 8, week 5 vs week 8, week 6 vs week 7 and week 6 vs week 8.

Table 3
Means and Standard Deviation for RPE (n = 21)

Time	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	*p*
Measures	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	Comparison
RPE	10.95 (±2.20)	10.77 (±2.19)	11.09 (±2.46)	11.63 (±2.51)	12.68 (±2.24)	12.44 (±2.64)	10.38 (±2.46)	9.28 (±.99)	*p* = .000** wk 1 vs wk 8 wk 3 vs wk 5 wk 4 vs wk 8 wk 5 vs wk 8 wk 6 vs wk 7 wk 6 vs wk 8

*Note: ** p < .01*

Changes in the POMS

As Table 4 shows, from the measurements of the five factors of the POMS, the significant changes in ratings for depression $F(7,13) = 3.209$, $p = .003$, $h^2 = .138$, $1\text{-}\beta = .945$ and fatigue $F(7,13) = 3.209$, $p = .032$, $h^2 = .138$, $1\text{-}\beta = .945$ during the eight weeks of the study are evident. However, there were no significant changes in anger $F(7,13) = 1.557$, $p = .153$ *ns*, $h^2 = .072$; $1\text{-}\beta = .633$, tension $F(7,13) = 1.041$, $p = .405$ *ns*, $h^2 = .049$, $1\text{-}\beta = .437$ and vigour $F(7,13) = 0.814$, $p = .577$ *ns*, $h^2 = .039$, $1\text{-}\beta = .341$.

Table 4
Means and Standard Deviation for Profile of Mood States (n = 21)

Time	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	*p*
Measures	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	Comparison
Depression	47.14 (±8.29)	47.57 (±7.80)	45.0 (±7.08)	44.95 (±5.20)	42.71 (±2.98)	42.61 (±3.42)	42.8 (±3.50)	42.85 (±3.58)	*p* = .003** wk 1 vs wk 5 wk 1 vs wk 6 wk 2 vs wk 7 wk 2 vs wk 8
Anger	44.42 (±6.4)	42.23 (±5.83)	42.71 (±6.52)	42.72 (±5.32)	41.14 (±4.8)	41.66 (±6.02)	40.66 (±4.23)	40.6 (±4.2)	*p* = .153
Tension	38.85 (±7.12)	38.76 (±6.79)	40.33 (±6.33)	38.85 (±6.53)	36.57 (±5.87)	37.0 (±6.2)	37.23 (±6.45)	37.2 (±6.4)	*p* = .405
Vigour	51.33 (±8.59)	51.42 (±7.72)	48.47 (±11.46)	50.57 (±11.04)	47.80 (±10.34)	48.80 (±11.81)	48.04 (±12.96)	48.0 (±12.9)	*p* = .577
Fatigue	40.09 (±4.57)	42.90 (±5.67)	44.85 (±6.49)	43.47 (±6.84)	40.9 (±6.52)	43.8 (±7.79)	40.47 (±5.65)	40.4 (±5.6)	*p* = .032* wk 1 vs wk 3 wk 1 vs wk 4 wk 3 vs wk 7 wk 3 vs wk 8 wk 6 vs wk 7 wk 6 vs wk 8

*Note: * p < .05; ** p < .01*

As observed in Table 4, according to the post hoc Bonferroni test, there was a statistically significant decrease ($p < .01$) in depression between week 1 vs week 5, week 1 vs week 6, week 2 vs week 7 and week 2 vs week 8. Furthermore, there was a significant higher mean rating for fatigue ($p < .05$) from the initial value (week 1) to weeks 3 and 4 of training. Later, there was a significant decrease between mean rating on week 3 and weeks 7 and 8. Finally, there was a significant decrease between mean rating on weeks 6, 7 and 8.

Relationship between training Volume and Ratings on the POMS

A mixed linear model analysis between training volume and POMS was conducted. A relationship between training volume and changes in ratings on the POMS were obtained from the AIC. As observed in Table 5, the scores follow a similar pattern of behaviour and therefore there is no significant difference ($p > .05$) between training volume and mean ratings for anger $F(7,152) = 0.229$, $p = .967$ (AIC = 388.579), tension $F(7,152) = 0.467$, $p = .832$ (AIC = 389.756), vigour $F(7,152) = 0.601$ $p = .729$ (AIC = 382.807) and fatigue $F(7,152) = 0.389$ $p = .886$ (AIC = 382.386). For ratings for depression ($F(7,152) = 0.427$, $p = .427$ (AIC = 377.939)), training volume was related but in reverse, without this difference being significant ($p > .05$).

Table 5
Relationship between Training Volume, RPE and Ratings on the POMS'

POMS	Training Volume			Rate of Perceived Exertion (RPE)		
	F (7,152)	AIC	*p*	*F* (7,152)	AIC	*p*
Depression	0.427	377.939	.427	4.145	447.530	.000**
Anger	0.229	388.579	.967	1.044	475.885	.403
Tension	0.467	389.756	.832	2.160	473.949	.041*
Vigour	0.601	382.807	.729	0.335	488.019	.937
Fatigue	0.389	382.386	.886	0.769	474.599	.614

*Note: POMS: Profile of Mood States; RPE: Rate of Perceived Exertion. * p < .05; ** p <.01*

Relationship between RPE and POMS

There was a relationship in the mixed linear model analysis between evolution of RPE and ratings for anger $F(7,152) = 1.044$, $p = .403$ (AIC = 475.885), vigour $F(7,152) = 0.335$, $p = .937$ (AIC = 488.019) and fatigue $F(7,152) = 0.769$, $p = .614$ (AIC = 474.599), following the same behaviour pattern in the eight weeks of the study.

RPE and ratings for depression $F(7,152) = 4.145$ $p = .000$ (AIC = 447.530) and tension $F(7,152) = 2.160$ $p = .041$ (AIC = 473.949) did not evolve in the same way and no significant differences were obtained ($p < .05$). This indicates that when RPE increases, scores for depression and tension decreased.

Discussion

The intent of the present study was to evaluate the changes and relationships of mood states and training volume, and perception of effort during an eight-week training programme. To the best of our knowledge, this is the first study that focuses on the relationships between evolution training volume, the sPOMS and RPE during an eight-week strength-training programme focusing on non-athlete adult males. There are many protocols in the literature that focus on the sportspeople population, which look for maximum performance, but there are few protocols for other populations. At the same time, one of the important contributions of this study is to analyse the relationship between training volume evolution and the state of mood evolution throughout the training period, aspects that have been analysed previously, but in sportspeople populations (Hernández et al., 2009; Torres-Luque et al., 2013).

Participants completed the POMS during the eight weeks of training. It has been documented that an increase in training volume has negative effects on the depression, tension and anger factors, and also reduces the vigour factor (Bonete, Moya, y Suay, 2009; Rouveix, Duclos, Gouarne, Beauvieux, y Filaire, 2006). In the present study, we ob-

served significant changes in the depression factor, showing an increase in the first weeks followed by a decrease until the end of the training ($p < .01$) (Table 4).

At the beginning of the programme, the sportsperson undergoes an adjustment period and during the second part of the training programme, the depression factor decreases and shows levels lower than the initial values. These data indicate that the programme is adapted to the chosen sample. A similar effect has been seen in programmes focused on health (Torres-Luque et al., 2010; Yoshihara et al., 2011), although with a different orientation and sample profile (pregnant women, yoga practitioners, etc.). At the same time, depression evolves in the same way as the training volume, that is to say, when the volume increases, depression tends to increase and also the other way around. This indicates that volume has an influence on the individual, but it is not high enough to have a negative influence, an aspect which has been documented at sport level (Garatachea et al., 2012; Hernández, Torres-Luque, y Olmedilla, 2009; Morgan, Costill, Flynn, Raglin, y O´Connor, 1988).

Regarding the vigour factor, this is the positive variable within the POMS (Fuentes et al., 1995) that tends to increase in competitive moments in studies with sportspeople (Hernández, Torres-Luque, y Olmedilla, 2009; Huttunen, Kokko, y Ylijukuri, 2004). Despite the data not being significant ($p > .05$), there is a decrease from the beginning of the programme (Table 4). The vigour factor is a factor linked to the idea of 'being ready' for competition and despite being focused on an adult training situation in which competition was not the objective of the training, we expected higher values in this sense. In elite sportspeople, it has been observed that strength training increases the vigour factor in a competitive period (Torres-Luque et al., 2013). As the current sample are not athletes, it would be logical to expect an increase in this factor. Perhaps the evolution of the training volume is inadequate for the population and would need to be reviewed in the future. It would be necessary to evaluate this factor over a longer time period to see if this tendency is more pronounced or not. Regarding the vigour factor, this is the positive variable within the POMS (Fuentes et al., 1995) that tends to increase in competitive moments in studies with sportspeople (Hernández, Torres-Luque, y Olmedilla, 2009; Huttunen, Kokko, y Ylijukuri, 2004).

If this fact is transferred to this case, observing fatigue over time could provide indications of how training is affecting the individual. In this study, there is an increase at the beginning of the programme, followed by a statistically significant decrease at the end of programme, when there is a decrease in the training volume (Table 4). These data agree with those obtained by Torres-Luque et al. (2010) in a training programme in an aquatic environment with pregnant women. At the same time, there is a relationship between evolution of this parameter and training volume.

Anger and tension factors do not show statistically significant changes during the training programme. At the same time, the relationship between the evolution of the training volume and the evolution of these factors is parallel, that is to say, when one increases the other factors do so and vice versa. Despite these not being statistically significant data, anger and tension tend to decrease during the programme (Table 4). This is an interesting fact, as it has been seen that an aerobic type of training has, as a consequence, an increase in factors such as tension, depression and hostility in elite judokas (Torres-Luque et al., 2013). In the same line as in this study, this fact has been confirmed in other training programmes such as yoga (Kirkwood, Rampes, Tuffrey, Richarsdson, y Pilkington, 2005; Smith, Hancock, Blake-Mortimer, y Eckert, 2007; Yoshihara et al., 2011). A systematic review of the use of yoga to treat anxiety suggested that yoga may be beneficial for different anxiety disorders (Kirkwood et al., 2005). Yoga was found to be as effective as relaxation in reducing anxiety (Smith et al., 2007; Yoshihara et al., 2011). Therefore, a well-designed strength-training programme could have positive effects over the mood state of the group, in which although there is an increase of training volume, factors like tension and hostility tend to decrease.

We also think that an innovative contribution of this study is to relate two psychological variables such as RPE and POMS over time. Separately, both variables have proved to be good indicators of how the training load affects the individual (de la Vega et al., 2008; Garatachea et al., 2012; Hernández, Torres-Luque, y Olmedilla, 2009; Kumae, Suzakawa, y Ishii, 2012). In this sense, we can see a parallel relationship between the evolution of RPE over time and anger, vigour and fatigue factors. These results seem obvious, as when the training intensity perception increases, so do these factors. Nevertheless, there is no relationship between the evolution of RPE and the evolution of depression and tension. We may expect a positive relationship between RPE and these factors and that when the training intensity increases, tension and depression would also do so. Nevertheless, the RPE values show the programme as light–slightly hard (Borg y Kaijser, 2006), which highlights again the need to connect the implication of training volume and intensity in a training programme that focuses on health and well-being. We believe that the relationship between these parameters is vital in the daily work of the trainer and it also opens a future line of research, with the present study being the first contribution in this sense.

The findings of the present study may be of great practical value for both sports scientists and fitness trainers. Since this is the first study on psychological changes after a strength-training programme in non-athletes, sports scientists may use its findings as reference in future studies. In addition, fitness trainers working with non-athletes would be aided to develop efficient strength-training programmes, taking into account psychological changes.

In conclusion, changes in the volume of training in eight weeks of a training programme are accompanied by changes in mood states (decrease in depression, changes in fatigue). The vigour factor exhibited no statistically significant changes but decreases during the training programme, which is a factor to watch in the future, as the volume of training may negatively affect adults. However, this is not the case in this study. In general, we can see a positive relationship between training volume evolution and mood states. The use of psychological indicators can contribute to better planning of training volumes in adults.

Resumen

El objetivo del estudio fue evaluar los cambios y las relaciones entre los estados de ánimo, el volumen de entrenamiento y la percepción de esfuerzo en adultos durante un programa de entrenamiento de fuerza de ocho semanas. Se seleccionaron 21 hombres adultos (30.19 ± 8.65 años; altura de 173.56 ± 7.0 cm; peso 78.07 ± 10.82 kg). Se controló el volumen de entrenamiento, el perfil de estados de ánimo (POMS) y la percepción subjetiva del esfuerzo (PSE) a lo largo de las ocho semanas. El análisis mostró que un volumen de entrenamiento bien planificado tuvo como respuesta la disminución en Depresión y Fatiga ($p < .05$). A su vez, se mostró una correlación positiva entre la evolución del POMS y la evolución del volumen de entrenamiento a lo largo del tiempo ($p < .05$); y entre el POMS y la PSE ($p < .05$). Por lo tanto, el uso de indicadores psicológicos puede contribuir a una mejor planificación del volumen de entrenamiento en los adultos. Estos hallazgos pueden ser útiles a los entrenadores con el fin de prescribir un volumen de entrenamiento óptimo en adultos.

Palabras clave*:* estados de ánimo, percepción, entrenamiento, actividad física.

Relação entre volume de treino, estados de humor e esforço percebido em adultos

Resumo

O objetivo do estudo foi avaliar as mudanças e as relações entre os estados de humor, o volume de treino e a perceção de esforço em adultos durante um programa de treino de força de oito semanas. Foram selecionados 21 homens adultos (30.19 ± 8.65 anos, altura de 173.56 ± 7,0 cm, peso 78.07 ± 10.82 kg). O volume de treino, o perfil de estados de humor (POMS) e a perceção subjetiva de esforço (PSE) foram monitorizados ao longo das oito semanas. Os resultados revelaram que um volume de treino bem planeado teve como resposta a diminuição da Depressão e Fadiga ($p < 0.05$). Por sua vez verificou-se uma correlação positiva entre a evolução do POMS e a evolução do volume de treino ao longo do tempo ($p < 0.05$); e entre o POMS e a PSE ($p < 0.05$). Portanto, o uso de indicadores psicológicos pode contribuir para um melhor planeamento do volume de treino em adultos. Estas conclusões podem ser úteis para os treinadores formadores, visando a prescrição de um volume de treino ótimo em adultos.

Palavras-chave: Estados de Humor; Perceção; Treino; Atividade Física.

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