

Is the rating of perceived exertion planned by the personal trainer similar to subject's perception? A pilot study

A percepção subjetiva de esforço planejada pelo treinador personalizado é similar à do aluno? Um estudo piloto

Witalo Kassiano Cláudio Assumpção Ulisses Cunha
Karla de Jesus Mário Simim Alexandre Medeiros

Abstract

The present study aimed to compare the intensity planned by the Personal Trainers (PTs) with that perceived by subjects in resistance training. Six male and female practicing resistance training (4 males and 2 females with mean age 33.0 ± 6.16 years, 1.3 ± 0.55 years training with follow-up) and two PTs participated in the study (average 32.0 ± 4.0 years, postgraduates, with a five -year or more experience). The comparison between the intensity planned by the PT and the intensity experienced by the subjects was determined by the Rating of Perceived Exertion (RPE). Previously, at the beginning of each training, the PT should respond individually to the RPE estimated for each student in that training session. At the end of each session, 30 minutes after its completion, this same scale was answered by the subjects. To compare the intensity of the sessions perceived by the subjects and that planned by the PTs, we used descriptive statistics, standardized mean differences and their confidence

Este site usa cookies para melhorar sua experiência de navegação. Leia nossa Política de Privacidade.

OK

intervals. Results have showed that subjects reported substantially higher intensities (small effect size) when compared to PTs. It has been concluded that the intensity experienced by the subjects was substantially higher than that planned by the PTs.

Key words

Intensity; Monitoring; Resistance training; Supervision

Resumo

Objetivou-se comparar a intensidade planejada pelos treinadores personalizados com a percebida por alunos no treinamento resistido. Participaram do estudo seis praticantes de treinamento resistido (4 homens e 2 mulheres; média de idade $33,0 \pm 6,16$ anos, $1,3 \pm 0,55$ anos treinando com acompanhamento) e dois treinadores personalizados (média de $32,0 \pm 4,0$ anos, pós-graduados, com experiência acima de cinco anos atuando como treinador personalizado). A comparação entre a intensidade planejada pelo treinador personalizado e a intensidade experienciada pelos alunos foi realizada através da aplicação da escala de percepção subjetiva do esforço (PSE). Previamente, ao início de cada treino, o treinador personalizado respondeu individualmente a PSE estimada para cada aluno naquela sessão de treinamento, e ao final de cada sessão, 30 minutos após seu término, esta mesma escala era respondida pelos alunos. Para a comparação entre a intensidade das sessões percebidas pelos alunos e a planejada pelos treinadores utilizamos as diferenças de médias estandardizadas, intervalos de confiança. Houve diferença substancial entre a PSE pretendida pelos treinadores personalizados e a experienciada pelos alunos no treinamento resistido. A intensidade percebida pelos praticantes foi maior do que a planejada pelos treinadores personalizados.

Palavras-chave

Intensidade; Monitoramento; Supervisão; Treinamento resistido

INTRODUCTION

A “personal trainer” (PT) is a Physical Education expert, skilled to plan and execute individual training aiming health ¹, ² and wellbeing ³. Literature in this scope has already demonstrated that training programs monitored by specialists present greater improvements and so their practitioners in comparison to unsupervised interventions ⁴⁻⁶. Therefore, an increasing population's concerning

is growing, having in consideration aspects related to health and quality of life ¹. This setting has been favouring an increasing in the search for a personal trainer's supervision and monitoring in physical activity practice ^{1, 4}.

To promote the improvement of physical fitness it is necessary a training plan and its systematization, watching the external load, the stimuli offered to the subject (i.e. weekly attendance, number of exercises, overload) and the internal effects (i.e. heart rate, delayed-onset muscle soreness, perceived effort) resulting from training ^{7, 8}. PT's knowledge in using tools allowing the follow-up of changes resulting from the intervention program, might potentiate subjects' positive adaptations, mainly to provide better adjustments in the training loads and suitable recovery periods ^{9, 10}.

Currently, there are several tools to monitor the chronic and acute effects of training internal load ^{11, 12} and among them is the Borg Rating of Perceived Exertion Scale (RPE Scale) ¹³, adapted by Foster et al. ¹⁴. This is a 0-10 item scale tool and hypothesizes that the physiological responses of physical stress are followed by average perceived answers ¹⁴. Results found using RPE scale have been effective in positive adaptations, both in high performance ^{15 - 17} and in the health scope ^{9, 18, 19}. RPE scale is also a simple and low-cost strategy to training load monitoring and control ²⁰. In this sense, to meet the pre-established goals it is necessary a balanced relationship between the training load planned by the PTs, i.e. RPE score, and that perceived by the subjects ^{14, 21}.

However, for example, in the Sciences of Sport have been reporting a gap between what has been planned by the coach and that perceived by the athletes ^{15 - 17, 21}. Brink, Frencken ²¹ have demonstrated that juvenile football players have perceived the training more intensely than what has been planned by the coach ²¹, which can favour overtraining ¹⁷. Foster, Heimann ¹⁴ suggest that one of the potential causes in the triggering of negative results in training is the incompatibility between the external load planned by the coach and the internal load perceived by the athletes.


Row, Knutzen ¹⁸ have reported in relation to health, the effectiveness when prescribing loads in resistance training, according to RPE reported by the subject. However, to the best of our knowledge, to date, no study has compared the intensity planned by the PT or fitness professional and that experienced by the subject in the resistance training. These findings can contribute to the control and improvement of the relationship dose/response in the resistance training under supervision and individual prescription. Hence, the objective of the current research was to compare the intensity planned by PTs to that perceived by the subjects in the resistance training.

METHOD

Subjects

Six subjects practicing resistance training participated in the study, both genders, four men and two women aged 33.0 ± 6.1 years; 1.3 ± 0.5 years with follow-up training and two PTs 32.0 ± 4.0 years old, experienced over five years as personal trainer. Inclusion criterion: subjects should attend training at least, three times a week, practicing time equal or above six months and with no injury report. PTs should be graduated in Physical Education, Post-graduation lato sensu, and holding, at least, a three-year experience in personal training. All the volunteers have been informed about study procedures. Data collection occurred as a training routine and the PTs were familiarized in recording the session intensity perceived by the subjects ²². The protocol was written in accordance with the standards established by the Declaration of Helsinki.

Procedures

Data collection has been carried out during volunteers' training sessions, totalling 20 sessions for six weeks. Sessions performed in the two first weeks (6 sessions) underpinned RPE. To guarantee a better subjects and PTs' RPE response reliability, the underpinning procedures have been used as described by Robertson, Goss ²³. Training has been carried out meeting each subject's specific goals, without interference from the study researchers.  Box 1 presents subjects' general planned training characteristics. All the sessions have been performed by the subjects in the habitual gym, maintaining their routine procedures. Previously, at the beginning of each training, the PT responded individually each subject's planned RPE and at the end of each session, after 30 minutes, this scale was responded by the subjects ¹².

Statistical Analysis

Initially, mean and standard deviations have been calculated using descriptive statistics. Later, the comparison between the intensity perceived by the subjects and that planned by the PTs was analysed through the magnitude-based inference ²⁴, standardized mean differences (SMD) and their confidence intervals (CI=90%). The quantitative probability of finding differences between PTs' and subjects' RPE has been qualitatively assessed through the scale: < 1%, almost certainly not; 1-5%, very unlikely; 5-25%, unlikely; 25-75%, possible; 75-95%, likely; 95-99%, very likely; >99%, almost

Este site usa cookies para garantir que você obtenha a melhor experiência de navegação. Leia nossa Política de Privacidade.

OK

RESULTS

Figure 1 presents subjects' intensity scores and those planned by the PTs, during training sessions. All the sessions have been rated as high intensity (RPE > 5).

Figure 2 presents the comparison between subject's perception of intensity and that planned by the PT. Subjects reported intensities substantially higher (effect size) when compared to PTs'.

DISCUSSION

This study aimed to compare the intensity planned by the PT and the one perceived by the subjects in the resistance training. To the best of our knowledge, this has been the first investigation to compare the intensity perceived by the recreational practitioner and the one planned by the PT. The main finding was that the RPE score experienced by the subjects was higher than the one planned by the PTs, being both RPE (planned and perceived) rated as "high intensity" (RPE > 5) ²⁵.

In the training setting, strong disagreements between coaches' planned contents and athletes' perception have been highlighted as a risk factor that might trigger the decreasing of sportive adaptation ¹⁴, ¹⁷, e.g. when planning a light stimulus session and the athletes' perception is not in the same line of agreement with the planned intensity. This scenario might provide the responses of an over or under estimated training, mainly due to an unsuitable recovery ¹⁴, ¹⁷ or in the absence of no physical fitness improvement ¹⁴, ¹⁷.

Although substantial differences have been found in RPE score, the impact of this difference has been small (ES = *Small*). If we take in consideration Foster, Florhaug ²⁵ proposal, it is possible to acknowledge that there has been a high agreement in the planned and perceived intensity zone. This enables us to infer that the coach was aware of the session impact, and thus, in the know to allow him to adjust the interval between strong stimuli.

Our findings corroborate the literature. Recent investigations conducted in team sports have been finding low connection between coaches' planning and athletes' perception ¹⁵, ¹⁷. On the other hand, individual sports have shown dissimilar findings. Some researches evidence a nearness between coach and athlete's RPE ¹⁴, ¹⁶ others report disagreement ²⁶. The latter scenario

theoretically favours a greater closeness between what has been planned by the PT/coach and the subjects/athletes' perception, hence allowing a personalized adjustment and a greater external training

Este site usa cookies para garantir que você tenha a melhor experiência em nosso site. Saiba mais sobre nossa Política de Privacidade.

OK

load control (i.e. repetition number, under pressure time, overload). However, even regulating the external load (i.e. volume, intensity, frequency) of two subjects, they might distinctively perceive the effort due to some factors, such as, readiness, training and injury background ²⁰ .

Scantlebury, Till ¹⁷ in a study comprising several modalities (rugby, hockey, football) reported that the connection between the planned and the perceived RPE tends to increase all the season through, as well as the agreement between RPE and the intensity [% Repetition Maximum (RM)], which also increases according to the subject/athlete's training level ²⁷ . These findings suggest that it might exist a minimum period where the PTs could be more sensitive in predicting sessions intensity, and that in the resistance training sessions the overload control (%RM) is reliable to better predict practitioner's RPE.

Despite having the above mentioned data, the majority of the researches has been conducted in the sportive performance scope ¹⁵ - ¹⁷ , which precludes greater conclusions on recreational practitioners of resistance training. The current investigation has shown that 100% of the sessions has been rated as "intense" (i.e. PSE > 5) ²⁵ , suggesting a high index of monotony, which is in the Sport Sciences an adverse characteristic to improve performance ²⁵ . Nevertheless, our data is not conclusive of resistance training in recreational practitioners, in relation to training load monotony, taking into consideration the small number and the interval between sessions.

The high session intensity found in the current study has shown that strength drills for lower limbs have evidenced higher RPE scores than the drills for upper limbs ²⁸ . Among the four weekly sessions performed by the participants, only one has been specifically directed to these muscle sets. Other factors can trigger a greater RPE, such as, the session total volume ²⁸ , drill overload (%RM), practitioner's previous experience and recovery level ²⁰ . PT's knowledge on these factors might contribute to a greater agreement between what has been planned and what has been experienced by the subject.

Planning intense sessions can be justified by the additional gains that stronger stimuli promote on physical fitness and body composition ²⁹ . Another factor influencing Pts' to apply heavy stimuli is the small quantity of weekly sessions (i.e. three sessions), hindering two intense stimuli on the same muscle set ³⁰ .

This investigation holds some limitations, such as, the non-monitoring of some variables of external

load, i.e. drills overload and session total volume, which, as shown above, have influence on RPE. This situation can be overcome by a greater experience and knowledge of the PTs. Further studies should verify these variables and help to respond to literature gaps on the relationship

Política de Privacidade

OK

between what is planned by PTs and what is perceived by their subjects. Also, studies ought to follow the population's medium- and long-term adaptations, concerning the agreement or disagreement between what has been planned by the PT and what has been perceived by the resistance training subject.

CONCLUSION

Current results have demonstrated that RPE scores reported by the subjects have been substantially higher (effect size) than those planned by PTs. However, both have presented a proneness to high intensity zone.

Acknowledgments

The authors thank all the subjects for their engagement in this study.

COMPLIANCE WITH ETHICAL STANDARDS

Ethical approval

The protocol was written in accordance with the standards established by the Declaration of Helsinki. All the volunteers have been informed about study procedures. Data collection occurred as a training routine and the PTs were familiarized in recording the session intensity perceived by the subjects.

How to cite this article

Kassiano W, Assumpção C, Cunha U, Jesus K, Simim M, Medeiros A. Is the rating of perceived exertion planned by the personal trainer similar to subject's perception? A pilot study. Rev Bras Cineantropom Desempenho Hum 2020, 22:e63257. DOI: <http://dx.doi.org/10.1590/1980-0037.2020v22e63257>

REFERENCES

- 1 Bossle CB. The personal trainer and the care of self: a perspective of professional mediation. Mov 2008; 14: 187-1998.

Este site usa cookies para garantir que você tenha a melhor experiência em nosso site. Saiba mais sobre nossa Política de Privacidade.

OK

- 2 Kravitz L. Highly effective personal training: an evidence-based review of teaching strategies. *Strength Cond J* 2010; 32: 87-89.
- 3 Anversa ALB, Oliveira AAB. Personal trainer: professional skills required by the job market. *Pensar Prát* 2011; 14.
- 4 Mazzetti SA, Kraemer WJ, Volek JS, Duncan ND, Ratamess NA, Gómez AL, et al. The influence of direct supervision of resistance training on strength performance. *Med Sci Sports Exerc* 2000; 32: 1175-1184.
- 5 Lacroix A, Hortobágyi T, Beurskens R, Granacher U. Effects of supervised vs. unsupervised training programs on balance and muscle strength in older adults: a systematic review and meta-analysis. *Sports Med* 2017; 47: 2341-2361.
- 6 Coutts AJ, Murphy AJ, Dascombe BJ. Effect of direct supervision of a strength coach on measures of muscular strength and power in young rugby league players. *J Strength Cond Res* 2004;18(2):316-23.
- 7 Bartlett JD, O'Connor F, Pitchford N, Torres-Ronda L, Robertson SJ. Relationships between internal and external training load in team-sport athletes: evidence for an individualized approach. *Int J Sports Physiol Perform* 2017; 12: 230-234.
- 8 Cardinale M, Varley MC. Wearable training-monitoring technology: applications, challenges, and opportunities. *Int J Sports Physiol Perform* 2017; 12: S255-S262.
- 9 Helms ER, Byrnes RK, Cooke DM, Haischer MH, Carzoli JP, Johnson TK, et al. RPE vs. percentage 1RM loading in periodized programs matched for sets and repetitions. *Frontiers in Physiol* 2018; 9: 247.
- 10 Shinya Yamauchi SM. Rating of perceived exertion for quantification of the intensity of resistance exercise. *Int J Phys Med Rehabil* 2013; 01.
- 11 Borresen J, Lambert MI. The quantification of training load, the training response and the effect on performance. *Sports Med* 2009; 39: 779-795.

Este site usa cookies para garantir que você tenha a melhor experiência em nosso site. Saiba mais sobre nossa Política de Privacidade.

OK

- 12 Nakamura FY, Moreira A, Aoki MS. Monitoramento da carga de treinamento: a percepção subjetiva de esforço da sessão é um método confiável? J Phys Educ 2010; 21: 1-11.
- 13 Borg GA. Psychophysical bases of perceived exertion. Med Sci Sports Exerc 1982; 14: 377-381.
- 14 Foster C, Heimann KM, Esten PL, Brice G, Porcari JP. Differences in perceptions of training by coaches and athletes. S Afr J Med Sci 2001; 8: 3-7.
- 15 Andrade FC, Nogueira RA, Coimbra DR, Miloski B, Freitas VH, Filho MB. Internal training load monitoring across a period training in volleyball players. Rev Bras Cineantropom Desempenho Hum 2014; 16(6):638.
- 16 Wallace LK, Slattery KM, Coutts AJ. The ecological validity and application of the session-RPE method for quantifying training loads in swimming. J Strength Cond Res 2009;23(1):33-8.
- 17 Scantlebury S, Till K, Sawczuk T, Weakley J, Jones B. Understanding the relationship between coach and athlete perceptions of training intensity in youth sport. J Strength Cond Res 2018;32(11):3239-3245.
- 18 Row BS, Knutzen KM, Skogsberg NJ. Regulating explosive resistance training intensity using the rating of perceived exertion. J Strength Cond Res 2012;26(3):664-71.
- 19 Lazzirini BS, Dropp MW, Lloyd W. Upper-extremity explosive resistance training with older adults can be regulated using the rating of perceived exertion. J Strength Cond Res 2017;31(3):831-836.
- 20 Abbiss CR, Peiffer JJ, Meeusen R, Skorski S. Role of ratings of perceived exertion during self-paced exercise: what are we actually measuring? Sports Med 2015; 45: 1235-1243.
- 21 Brink MS, Frencken WG, Jordet G, Lemmink KA. Coaches' and players' perceptions of training dose: not a perfect match. Int J Sports Physiol Perform 2014; 9: 497-502.
- 22 Winter EM, Maughan RJ. Requirements for ethics approvals. J Sports Sci 2009; 27: 985.

Este site usa cookies para garantir que você tenha a melhor experiência de navegação. Saiba mais em nossa Política de Privacidade.

OK

- 23 Robertson RJ, Goss FL, Rutkowski J, Lenz B, Dixon C, Timmer J, et al. Concurrent validation of the OMNI perceived exertion scale for resistance exercise. *Med Sci Sports Exerc* 2003; 35: 333-341.
- 24 Hopkins W. Linear models and effect magnitudes for research, clinical and practical applications. *Sportscience* 2010; 14: 49-58.
- 25 Foster C, Florhaug JA, Gottschall L, Hrovatin LA, Parker S, Doleshal P, et al. A new approach to monitoring exercise training. *J Strength Cond Res* 2001; 15: 109-115.
- 26 Cruz R, Fretas JV, Santos JPNR, Castro PHC, Siqueira R, Alves DL, et al. Comparison between the RPE planned by coach with perceived by youth athletes of track and field. *Rev Bras Ciên Mov* 2017; 25: 13-18.
- 27 Testa M, Noakes TD, Desqorces FD. Training state improves the relationship between rating of perceived exertion and relative exercise volume during resistance exercises. *J Strength Cond Res* 2012; 26: 2990-2996.
- 28 Lodo L, Moreira A, Zavanela PM, Newton MJ, McGuigan MR, Aoki M. Is there a relationship between the total volume of load lifted in bench press exercise and the rating of perceived exertion? *J Sports Med Phys Fit* 2012; 52: 483-488.
- 29 Mayer F, Scharhag-Rosenberger F, Carlsohn A, Cassel M, Muller S, Scharhag J. The intensity and effects of strength training in the elderly. *Dtsch Arztebl Int* 2011; 108: 359-364.
- 30 Ralston GW, Kilgore L, Wyatt FB, Baker JS. The effect of weekly set volume on strength gain: a meta-analysis. *Sports Med* 2017; 47: 2585-2601.

Publication Dates

» Publication in this collection	» Date of issue
09 Mar 2020	2020

Este site usa cookies para garantir que você tenha a melhor experiência em usar o site. Para saber mais, leia nossa Política de Privacidade.

OK

History

» **Received**
22 Apr 2019

» **Accepted**
07 Jan 2020



This is an Open Access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Universidade Federal de Santa Catarina

Universidade Federal de Santa Catarina, Campus Universitário Trindade, Centro de Desportos - RBCDH, Zip postal: 88040-900 - Florianópolis, SC. Brasil, Fone/fax : (55 48) 3721-8562/(55 48) 3721-6348 - Florianópolis - SC - Brazil
E-mail: rbcdh@contato.ufsc.br

Este site usa cookies para melhorar sua experiência de navegação. Leia nossa Política de Privacidade.

OK

SciELO - Scientific Electronic Library Online

Rua Dr. Diogo de Faria, 1087 – 9º andar – Vila Clementino 04037-003 São Paulo/SP - Brasil

E-mail: scielo@scielo.org



Leia a Declaração de Acesso Aberto

Este site usa cookies para melhorar sua experiência de navegação. Leia nossa Política de Privacidade.

OK