1RM bench press performance: a new method of evaluation in recreational male and female

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Citation: THOMAS, E. ... et al., 2013. 1RM bench press performance: a new method of evaluation in recreational male and female. IN: Balague, N. ... et al., (eds.) Book of Abstracts of the 18th Annual Congress of the European College of Sport Science – 26th - 29th June 2013, Barcelona – Spain, pp. 116 - 117.

Additional Information:

- This abstract was published in the Book of Abstracts of the 18th Annual Congress of the European College of Sport Science – 26th - 29th June 2013, Barcelona – Spain. The conference website is at: http://www.ecss-congress.eu/2013/13/

Metadata Record: https://dspace.lboro.ac.uk/2134/12684

Version: Published

Publisher: © European College of Sport Science

Please cite the published version.
18th annual Congress of the

EUROPEAN COLLEGE OF SPORT SCIENCE

26th - 29th June 2013, Barcelona – Spain

BOOK OF ABSTRACTS

Edited by:
Balagué, N., Torrents, C., Vilanova, A., Cadefau, J., Tarragó, R., Tsolakidis, E.

Hosted by the:
National Institute of Physical Education of Catalonia (INEFC)

ISBN 978-84-695-7786-8
Introduction

Demographic change, an extended work life and the employee’s health show growing importance in today’s professional world. Thus, employers face the challenge of finding qualified trainees. In addition, older employees need more time to convalesce. Promoting the health of older employees strongly is crucial in order to employ them until retirement. Methods 157 younger (<45 years) and older workers (≥45 years) (102 men, 55 women) in a medium-sized business took part in a two-year project regarding workplace health promotion. All employees were tested at the beginning (T1) and at the end of the project (T2) towards their work ability and physiologic parameters (body mass index, lipoproteins). The physiologic parameters were measured through diagnostic methods, work ability was assessed through the work ability index (WAI). An intervention focused on both condition oriented (i.e. physical activity, nutrition) and behaviour oriented prevention (i.e. job-ana-lysis, ergonomics). Results Work ability (r > 0.5) and physiologic parameters (p < 0.05) showed no age-related difference. Age was not associated with work ability. Age was positive associated with body mass before (r = 0.31**, p < 0.01) and after the intervention (r = 0.30**, p < 0.01). Age was also positive associated with LDL-cholesterol before (r = 0.35**, p < 0.001) and after the project (r = 0.30**, p < 0.01). Discussion We could not find any association between age and work ability. This is in accordance to other studies (Berg et al., 2009; Freude et al., 2000). Younger employees were less likely to be overweight than older employees. This positive association is consistent with findings from further research (Reas et al., 2007). Also, older workers showed a higher LDL-cholesterol than younger workers. This finding was expected, since it is assumed that the LDL-cholesterol level rises with increasing age (Pothof et al., 2007). The results indicate the importance of workplace health promotion for the health status of employees, especially older workers. References BERG, E. van den, Zwart, B. de, Burdorf, A. (2009) The effects of work-related and individual factors on the Work Ability Index: a systematic review. Occup Envir med, 66:211-220. Freude, G., Ullsprenger, P., Dehoff, W. (2000) Hrsg.: Bundesanstalt für Arbeitsschutz und Arbeitsmedizin. Zur Einschätzung von Vitalität, Leistungsfähigkeit und Arbeitsbewältigung älterer Arbeitnehmer. Wirtschaftsverlag NW, Bremerhaven. Reas, D.L., Nygård, J.F., Svensson, E., Sørensen, T., Sandanger I. (2007) Changes in body mass index by age, gender and socio-economic status among a cohort of Norwegian men and women (1999-2001). BMC Public Health, 7:35-47. Parasher, K.G. (2007) Hohes Alter und hohe Blutfette – was nun? Gültige Empfehlungen für die Therapie der Hyperlipoproteinämie beialten Patienten. CME, 4(6):60-67.

ASSOCIATION BETWEEN INTRA-PERSONAL PRESSURE AND MUSCLE ACTIVITY LEVELS OF TRUNK MUSCLES

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Introduction

Intramuscular pressure is defined as the pressure within a muscle. IAP plays an important role in acquiring stability and stiffness of the spine (Cholewicki et al. 2002). IAP is increased during various tasks, e.g. lifting and jumping. However, how IAP varies among tasks remains question. Furthermore, it is also unknown whether IAP measurement has good repeatability inter- and intra-day. We examined 1) the repeatability of IAP measurement over repeated trial inter- and intra-day, and 2) the exercise-related difference in the increase of IAP with relation to the activity level of trunk muscles during various tasks. Methods Six young males performed bracing, drawing, isometric trunk flexion and extension tasks with maximal voluntary effort. During these tasks, IAP with a pressure transducer placed in the rectum and surface electromyography (EMG) activities from rectus abdominis (RA), oblique external (OE) and internal (IO) muscles, and erector spine muscle (ES) were determined. All subjects performed each task twice in inter- and intra-day. Results There was no significant difference in IAP during each of the task in either the inter- or intra-day comparisons. Intra-class correlation coefficient for IAP measurement was 0.987 for inter-day and 0.779 for intra-day. To examine the association between IAP and EMG amplitude, the data were averaged across trials and days in each task. The maximal IAP value obtained in each task was 84.4±13.0mmHg for bracing, 74.4±14.4mmHg for trunk extension, 55.9±15.5mmHg for trunk flexion, and 9.5±4.5mmHg for drawing. The IAP in drawing was significantly lower than those in the other tasks. For all tasks except for drawing, IAP linearly increased with increases in the exerted force (r = 0.71 - 0.94) and EMG amplitude (r = 0.297 - 0.704). The slope of the regression line in the relationship between IAP and muscle activity levels for each muscle differed among the tasks. Discussion The findings obtained here were 1) IAP measurement has good inter- and intra-day repeatability, satisfying the standard value of repeatability (r≥ 0.75) (Vincent, 1995), and 2) increase of IAP differs among the tasks although IAP increases in proportion to exerted force and muscle activity levels of trunk muscles in each task. The current findings on the association between IAP and muscle activity levels of trunk muscles are consistent with earlier findings (Cresswell et al., 1992; Cholewicki et al., 2002). On the other hand, the task-related difference observed in the association between IAP and muscle activity levels indicates that the contribution of trunk muscle activation to IAP depends on exercise modality. In general, draining maneuver has been considered to elevate IAP, but the current result did not support this. This may be derived from the posture-dependent difference (standing vs. prone). References Cholewicki J, Ivaric P.C, Radebold A (2002) Eur J Appl Physiol 87:127-133. Cresswell AG, Grundstrom H, Thorstensson A (1992) Acta Physiol Scand 144:409-418. Vincent, W.J. (1995) Statics in Kinesiology. Champaign IL: Human Kinetics.

IRM BENCH PRESS PERFORMANCE: A NEW METHOD OF EVALUATION IN RECREATIONAL MALE AND FEMALE

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Introduction

The bench press test is the most valid in determining upper body maximal strength in both athletes and sedentary. Various approaches are used for its evaluation, both through prediction equations or practical attempts. The aim of this study is to use a new method for the evaluation of the bench press test (BPP) using combined previous validated theoretical and practical procedures. Methods Fifteen participants (8 male Ages: 23.5±2.3, 2.3 FWI=17.3±9.2 and 7 female Ages: 27.9±10 FWI=25.6±6.6, 9) with no specific training history were tested. Physiological parameters were recorded before, during and after each attempt. In first instance, the participants had to perform repetitions to fatigue (RTF) with 1/3 of their body mass (BMI) for a maximum of 25 repetitions. After a 5-minute rest, RTF were assessed with ½ of BM and the number of repetitions performed was then used on the theoretical Mayhew’s equation. Subsequently the participants were invited to attempt the Mayhew 1-RM for a maximum of three attempts. RPE scale was used during
experimentation. Results ¼ BMI workload was significantly (0.01) gender related with RTF showing higher performance values for male (25±6.6 repetitions) compared to female (11±10.6 repetitions). Moreover, compared to RTM performance the Meyhew’s equation showed a percentage accuracy of 0.7% in female and an underestimation of 18.3% in male. No significant difference between genders were found on Blood Lactate (IBL) and RPE recorded immediately post RTM performance. Oxygen uptake (VO2) and Heart rate (HR) showed some significant differences. Conclusions Despite the study at this stage is still a pilot it leads to consider this new method effective for recreational male and female. High accuracy percentage suggests low time consuming testing sessions and easiness in estimating RTM on the bench press. At this stage the study confirms the safety and feasibility of the BP test and the accurateness of Meyhew’s equation in particular in female.

EVALUATION OF CHRONOTYPES IN YOUNG ITALIAN PHYSICALLY ACTIVE ADULTS

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INTRODUCTION The expression of circadian rhythms can be different in people and this trait can be defined as “circadian typology” or “chronotype”. There are three different chronotypes: Evening-type (E-type), Morning-type (M-type) and Neither-type (N-type). Morning types show an early sleep-wake cycle and have their best performances in the morning, on the contrary evening-types show a late sleep-wake cycle and they have the best performances in the evening. The circadian typology emerges especially during adolescence and it is influenced by individual factors, like age and sex, and by environmental factors. The chronotype is typically defined by a validated questionnaire, the Morningness-Eveningness Questionnaire (MEQ)2. METHODS 500 subjects, Italian students of Sports Sciences from University of Milan, 345 males and 155 females, mean age: 21.9 ± 2.24 have been recruited. They compiled voluntarily the MEQ to determine their chronotype. The MEQ has been related with age, sex and photoperiod at birth for each subject. None of the participant was a shift worker. Ten subjects for each category of chronotype (10 M-types, 10 E-types and 10 N-types) were an actigraph to evaluate the sleep-wake cycle and the level of physical activity across the day. RESULTS MEQ scores showed that the subjects were 334 N-types, 117 E-types (105 Moderate E-types and 12 Extreme E-types) and 49 M-types (48 Moderate M-types and 1 Extreme M-type). The mean score of MEQ was 48.18 ± 8.66 but, as we expected, women totalized a higher mean score (49.54 ± 8.57) if compared to men’s mean score (46.82 ± 8.69). The data collected by the actigraphs showed that E-types were more physically active starting from the late afternoon until night and the M-types were more active in the morning. DISCUSSION We observed that individual factors, age and sex, influenced the chronotype: being our sample composed by young students, there were, as expected, more E-types (23.4%) than M-types (9.8%) and girls showed greater scores of the MEQ with a predisposition toward morningness compared to men. E-types had the predisposition to be active and to practice physical activity in the late afternoon/evening and M-types had the predisposition to be active and to practice physical activity in the morning. Training programs should be scheduled according with the individual’s chronotype. REFERENCES 1. Horne, J.A., Bruss, C.G. & Petuit A.N. (1980). Ergonomics 23: 29-36. 2. Horne, J.A. & Ostberg, O. (1976). Int J Chronobiol, 4(2), 97-110. 3. Kim, S.J., Lee Y.J., Kim H., Cho I.H., Lee J.Y., & Cho S.J. (2010). J. Psychosom Res. 68: 159-164. 4. Park, Y.M., Matsumoto, K., Seo, Y.J., Kang, M.J., & Nagashima, H. [2002]. Perceptual and motor skills, 94, 1199-1213.

EFFECTS OF SOCIAL AND ENVIRONMENTAL DETERMINANTS ON OVERWEIGHT AND OBESITY AMONG BRAZILIAN SCHOOLCHILDREN

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Introduction Current evidence suggests that the development and execution of intervention programs related to prevention and management of overweight and obesity require the identification of obesogenic social and environmental determinants [1]. Studies available in literature have shown the complex association between social and environmental determinants and obesity [2,3]. The aim of this study was to identify the social and environmental determinants that are most strongly associated with the prevalence of overweight and obesity in a representative sample of Brazilian schoolchildren assisted by Parana Health Program. Methods The Parana Health Program is an action of the State of Parana’ Secretariat of Sport serving approximately 2 million of schoolchildren. Its activities are focused on the prevention and weight management through nutrition education and physical activity. The study used multistage sampling to obtain representative estimates of the schoolchildren population from the State of Parana, Brazil. A total of 5460 subjects (2946 girls and 2514 boys) aged 4 to 20 years were included in the study. Overweight and obesity were defined by body mass index, based on sex-and-age-specific cut-off recommended by the IOTF. Social and environmental determinants were collected using a structured questionnaire. The impact of social and environmental determinants on the prevalence of overweight and obesity were analyzed using odds ratios (OR), established by binary logistic regression adjusted for the remaining independent variables included in the regression models. Results In girls, prevalence of overweight and obesity were 18.9% and 8.2%, respectively, whereas the corresponding numbers in boys were 18.6% and 9.5%. The chance of overweight was higher in schoolchildren that engaged in 2 hours or more of daily screen time (OR = 2.41, 95% CI 1.52–3.48), whose parents had higher educational levels (OR = 1.82, 95% CI 1.42–2.37), ≤ 2 siblings (OR = 1.92, 95% CI 1.39–2.67) and high economic class (OR = 2.07, 95% CI 1.47–2.75). Schoolchildren who traveled by car to school (OR = 1.60, 95% CI 1.24–1.97), lived within a radius of ≤5 km from school (OR = 1.56, 95% CI 1.17–2.11) and consumed foods sold in the school cafeteria (OR = 1.88, 95% CI 1.49–2.34) presented a high odds of overweight. Conclusions The background from a particular region of a country should be considered when implementing preventive measures regarding overweight and obesity. Measures taken should consider a multi-level intervention that includes the family, school and physical environment. References [1] Swinburn B, Egger G, Raza F. Prev Med. 1999; 29:563-570. [2] Johnson-Taylor WL, Everhart JE. Obesity (Silver Spring). 2006; 14:929-966. [3] Dunton GF, Kaplan J, Wolch J, Jerrett M, Reynolds KD. Obes Rev. 2009; 10:393-402.

SPEED OF TREADMILL WALKING AND SURVIVAL IN PATIENTS WITH CARDIOVASCULAR DISEASE. A 10-YEAR FOLLOW UP STUDY


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Introduction Walking speed has been shown to be associated with survival in older adults [1]. In this study the association between the speed maintained in a 1Km walking test and all-cause mortality in patients with cardiovascular disease has been determined. Methods 1255 male patients, aged 25-85 years at baseline, completed 1 km treadmill walking test [2] at moderate intensity corresponding to a