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Escopo

A revista Motricidade (ISSN 1646-107X, eISSN 2182-2972) é uma publicação científica trimestral, propriedade das Edições Desafio Singular. A política editorial da revista visa contribuir para o desenvolvimento e disseminação do conhecimento científico de caráter teórico e empírico nas áreas científicas do desporto, psicologia e desenvolvimento humano, e saúde, adotando sempre que possível uma natureza interdisciplinar.

Scope

Journal Motricidade is a scientific electronic journal, publishing quarterly and property of Desafio Singular Editions. Its editorial politics aim is contributing to the development and dissemination of scientific knowledge of theoretical and empirical character in the context of sports, psychology and human development, and health assuming whenever is possible an interdisciplinary commitment.

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O21. Load: too much or too little?

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INTRODUCTION

From a labour perspective the manual handling of loads (MHL) may compromise workers health. From an exercise perspective MHL may improve physical fitness and health. A Council Directive defines MHL as "any transporting or supporting of a load, by one or more workers, including lifting, (…), which, by reason of its characteristics or of unfavourable ergonomic conditions, involves a risk particularly of back injury to workers" (Council, of 29 May 1990). Portuguese law specifies a load limit of 30kg for occasional operations at work or 20kg if handled frequently (DL, 330/1993 of September 25). More than 25kg and or 25 times/day of lifting during work were associated with an annual incidence increase of low back pain (LBP) (Coenen et al., 2014). The World Health Organisations (WHO) states health benefits for adults (aged 18–64) from muscle-strengthening activities (moderate to vigorous intensity, 3-5 days/week, 30-60 minutes/session) (WHO, 2010). Dose-response recommendations for strength development ranged from 60% of one-repetition maximum (1RM) for untrained individuals to 85% of 1RM for athletes (Peterson, Rhea, & Alvar, 2005). The National Institute for Occupational Safety and Health (NIOSH) developed the Revised NIOSH lifting equation (RNLE) to find a recommended weight limit (RWL) and lifting index (LI) for workers based on seven lifting related task factors (Waters, Putz-Anderson, & Garg, 1994). The RWL is the lifting weight that nearly all healthy workers could perform over a substantial period (e.g., up to 8 hours) without an increased risk of developing LBP. The LI estimates the level of physical stress associated to lifting. Both are widely used and there is considerable literature on the subject (Boda, Bhoyar, & Garg, 2010; Lu, Waters, Krieg, & Werren, 2013; Ngo, Yazdani, Carlan, & Wells, 2017). The present paper aims to apply the RNLE to deadlift, an exercise commonly used in weight lifting programs.

METHODS

Three healthy adult males (34±10 years old; 167.3±2.5 cm height) were engaged to the study: P1) untrained (<1 year of consistent strength training), P2) recreationally trained (>1 year of consistent strength training; and P3) professional athlete.

One deadlift was performed under the following weight conditions: P1) 60% of 1RM (20kg), P2) 80% of 1RM (40kg), and P3) 85% of 1RM (50 kg).

RESULTS

The RNLE did not apply to P2 and P3. Both exceeded the load constant of 23kg (RWL for ideal conditions of lifting). RWL for P1 was 17.5kg and LI was 1.14 suggesting 20kg may increase the risk of developing LBP (Table 1).

Table 1

Data introduced for the 7 multipliers used to calculate RWL and LI

Participant	Load constant	Horizontal	Vertical	Distance	Asymmetric	Frequency	Coupling	**RWL**	**LI**
P1) Untrained	23 kg	1 (25cm)	0.844 (23cm)	0.90 (56cm)	1 (0º)	1 (≤0.2 lifts/min; ≤1 hour; <75cm)	1 (good)	**17.5 kg**	**1.14**

CONCLUSIONS

Is there a science for workers and another for untrained, recreational or athletes' populations? Should regulations and laws apply to all? Are professional athletes workers? Is "science" facing the problem from different and contradictory perspectives?

References.

Boda, S. V., Bhoyar, P., & Garg, A. (2010). *Validation of revised NIOSH lifting equation and 3D SSP model to predict risk of work-related low back pain.* Paper presented at the Proceedings of the Human Factors and Ergonomics Society Annual Meeting.