



Contents lists available at ScienceDirect

Journal of Science and Medicine in Sport

journal homepage: www.elsevier.com/locate/jsams



Original research

The prevalence and performance of resistance exercise training activities in an Australian population in relation to health authority guidelines

Brendan Humphries^{a,*}, Rob Stanton^a, Aaron Scanlan^a, Mitch J. Duncan^b

^a Central Queensland University, School of Medical and Applied Sciences, CQUniversity, Australia

^b University of Newcastle, School of Medicine and Public Health, Australia

ARTICLE INFO

Article history:

Received 18 December 2016

Received in revised form

14 September 2017

Accepted 20 September 2017

Available online xxx

Keywords:

Intensity

Exercise

Strength

Resistance training

ABSTRACT

Objectives: Resistance training research highlights the importance of training intensity to resistance exercise training (RET) and the associated benefits to health and function for healthy and at-risk populations. The American College of Sports Medicine (ACSM) recommend specific intensities, frequencies, repetitions, and number of exercises of RET to be performed to maintain health. The primary aim of this study was to describe the prevalence of achieving recommended levels of RET in relation to ACSM guidelines for intensity, frequency, repetitions, and number of exercises in a regional Australian population.

Design: A Computer-Assisted-Telephone-Interview (CATI) survey (n = 1237) was conducted to determine RET participation.

Methods: Participants were 18 years plus, residing in Central Queensland, Australia.

Results: The prevalence of respondents performing 'No RET', 'insufficient RET' and 'sufficient RET' were 79.6.0%, 15.2% and 5.2% respectively. Significantly higher proportions of younger adults adhered to all RET guidelines for intensity (19.2 vs 8.1%), frequency (19.9 vs 11.6%), repetitions (17.8 vs 6.3%), and number of exercises (8.2 vs 3.6%) (p < 0.05). Significantly higher proportions of males, younger adults (18–34 years), higher educated individuals (> 15 years), and individuals engaging in sufficient levels of aerobic exercise training (AET) engaged in sufficient levels of RET (p < 0.05).

Conclusions: The prevalence of Australian's participating in regular RET programs is low and only a small proportion of participants meet ACSM guidelines for the quantity and quality of RET that is likely to provide health benefits. This has implications for public health policy and the future development and promotion of population-level RET guidelines.

© 2017 Sports Medicine Australia. Published by Elsevier Ltd. All rights reserved.

1. Introduction

Participation in regular physical exercise training incorporating resistance exercise, aerobic, flexibility and neuromotor based activities is important to promote health, wellbeing and functional independence, particularly for older adults.^{1,2} Specifically, engagement in resistance exercise training (RET) can benefit health by improving glucose control,³ cardiac risk factors,⁴ falls and frailty,⁵ bone density,^{6,7} cancer,⁸ kidney disease,⁹ mental health^{10,11} and functional performance.¹² These benefits are observed in a variety of populations including adolescents, the elderly and clinical populations.^{13,15,16} Current Australian exercise prescription recommendations for healthy and older adults promote engagement

in RET to maintain health benefits.¹⁷ The guidelines are typically derived from the American College of Sports Medicine (ACSM) which details the minimum number of sets, exercises, repetitions and intensity (example, % one repetition maximum (%1RM)) required for apparently healthy adults to build muscular strength and endurance to gain complementary health benefits associated with RET participation.^{1,18,19} However, the public health message for specific prescription regarding RET is often diluted in the many brochures, fact sheets and media releases that mostly promote performing some muscle strengthening activities.²⁰

Previous monitoring of RET, assessing either engagement in RET or the frequency of participation has been conducted in Australian, U.S. and Japanese adults.^{21,25,26} In Australian adults, engagement in any RET in the previous week is 13.7% and does not differ between genders; however, higher proportions of younger adults (23.8%) report any participation in RET compared to older adults (7%).²³

* Corresponding author.

E-mail address: b.humphries@cqu.edu.au (B. Humphries).

Bennie et al.²⁴ also report 10.4% engagement in RET and higher proportions of younger adults (13.5%) compared to older adults (7%) performing RET. Current ACSM guidelines recommend adults engage in a minimum of two RET sessions per week. However, only 3.9% of Japanese adults and 19.6% of US adults achieve this target with substantial variation in reported intensity and among socio-demographic categories. In both Japanese and US populations, higher proportions of men and younger adults engage in, or are more likely to engage in RET compared to women and older adults.^{21,22,27} These studies are useful in identifying initial patterns among populations; however, they do not assess other characteristics of RET training programs such as training intensity, frequency, exercise repetitions or the number of exercises performed, which are all important in producing benefits to health and strength adaptations.^{14,28,29} Current RET guidelines from the ACSM call for moderate to vigorous intensity, using 3 sets of 8–12 repetitions and 8–10 exercises for all of the major muscle group. It should be recognised, however, that the ACSM statement represents a guideline, and that manipulation of these training variables over short and long term training programs can have a profound effect upon the body altering muscular, skeletal, hormonal, neural, metabolic and cardiovascular responses.^{14,15,28} Additionally, the health benefits when participating in high intensity RET appear to have a longer lasting effect on health.³⁰ However to date, no studies have examined these RET variables at the population level to determine RET engagement. It is important to capture information on these parameters when assessing RET engagement. Furthermore, assessing these training variables independently permits determination of RET engagement at the minimum quality and quantity to promote health as described by the ACSM. Data from such a study can help inform policy and practice in RET implementation to improve functional capacity and quality of life. Therefore, the primary purpose of this study was to examine the prevalence of meeting ACSM guidelines for RET intensity, frequency, repetitions, and number of exercises. This study will also report on participants meeting ACSM RET guidelines by various socio-demographic categories using recommended criteria.^{18,19,25}

2. Methods

Participants (n=1237) were adults aged 18 years and over, residing in Central Queensland, Australia that were able to be contacted by land line telephone. Participants completed a computer-assisted-telephone-interview (CATI) survey as part of the Central Queensland Social Survey (CQSS) conducted by the Population Research Laboratory, Central Queensland University Australia. The CQSS is an omnibus CATI survey conducted in October–November each year since 1999. The survey methodology of the CQSS is replicated each year and further details of these are provided elsewhere.²³ Briefly, participants were selected in a two stage process; first, households were randomly selected from database of current telephone numbers followed by randomly selecting the gender of the respondent within the household and inviting them to participate. Due to the omnibus nature of the CQSS participants provided information on a variety of issues including physical activity level, participation in RET and socio-demographics. The overall response rate was 39.4% representing 1237 completed interviews. The estimated sampling error at the 95% confidence level using a 50/50 binomial percentage distribution based on survey estimates for the total sample of 1237 are 0.0278% points, 19 times out of 20.³¹ CQUUniversity's Human Research Ethics Committee provided ethical clearance for the study (H07/08-081).

Exercise prescription criteria referencing ACSM recommendations for healthy adults are used in the current study to determine

if participation in RET is at a level sufficient to derive a health benefit.^{1,18} These criteria state that RET should be performed at a moderate intensity using an Rating of Perceived Exertion (RPE) scale between 1 'no effort' to 10 'maximal effort' at an intensity of 5–6 on the RPE scale or (60–70% 1RM) or vigorous (RPE 7–8) (80–100% 1RM); with a frequency of at least two days per week; using 3 sets of 8–12 repetitions of a program comprising 8–10 exercises involving all the major muscle groups. The ACSM guidelines state that RET can include progressive weight training, weight bearing activities and other resistance exercises that utilise major muscle groups.^{1,18} In line with this and in order to capture activities that may meet this definition that are performed outside of formal gym settings the following question was used to differentiate individuals participating in RET from those who did not, those who did not participate in RET were not queried further on their RET participation. A single dichotomous yes or no response was asked for the question "Do you currently perform any strength based training to build or maintain muscle? This could include activities such as training at home or the gym using barbells, dumbbells, hand weights or weight machines." The following items were then used to examine the number of days, number of different RET exercises performed, repetitions of each RET exercise and the intensity of RET. "How many days each week do you perform strength based training activities?" "When you perform the activities to build or maintain muscle, how many different exercises do you perform?" "On average how many repetitions do you perform in each set?" and "Thinking about the weight that you lift during your muscle strengthening sessions, we would like you to categorise the intensity of this weight on a scale of 1–10, where 1 means that it is no effort at all, 5 is moderate effort and 10 is the weight you can only lift once." The scale to determine intensity was based on the level of effort for RET statement in the ACSM guidelines, on a 0–10 RPE scale, where no movement is 0, and maximal effort of a muscle group is 10, moderate-intensity effort is a 5 or 6 and high-intensity effort is a 7 or 8, and previous research on perceived exertion scales for RET.^{28,32,33} Age specific (<65 = 8–12; ≥65 = 10–15 repetitions) were used in line with current guidelines for RET to maximise strength development.^{1,18} Respondents that met the ACSM RET guidelines for intensity, frequency, repetitions, and number of exercises were categorised as 'sufficient RET'; those respondents participating in RET but not meeting all ACSM RET guidelines were categorised as 'insufficient RET', and those respondents not performing an RET were categorised as 'No RET'.

The statistical relationship between all descriptive variables was assessed as mean and SD values. A Pearson's Chi square statistic was used to examine the relationship between different exercise prescription criteria for participation in RET and socio-demographic categories. Cramer's V was also used as a post-test to determine strengths of association between variables as directional (+/–) and categorised as <0.10 = significant, very weak, 0.10–0.19 = significant, weak, 0.20–0.29 = significant, moderate and ≥0.30 = significant, strong.³⁴ Pearson's Chi square was also used to examine relationships between socio-demographic categories and meeting the separate frequency, number of exercises, repetitions and intensity of RET criteria. All analyses was performed using Statistical Package for Social Sciences (SPSS) for Windows (version 22.0). An alpha level of $p < 0.05$ was used for significance.

3. Results

The overall response rate for the survey was 39.36% and is similar to other recently conducted telephone interviews.²³ The overall prevalence of engagement in RET was 20.4% with 15.2% of respondents participating in RET that was at a level not sufficient

Download English Version:

<https://daneshyari.com/en/article/8592787>

Download Persian Version:

<https://daneshyari.com/article/8592787>

[Daneshyari.com](https://daneshyari.com)