

SHORT REPORT

The exercise addiction inventory: a quick and easy screening tool for health practitioners

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Br J Sports Med 2005;39:e30 (<http://www.bjsportmed.com/cgi/content/full/39/6/e30>). doi: 10.1136/bjism.2004.017020

Background: Exercise addiction is not routinely screened for probably because available instruments take a long time to administer, their scoring may be complicated, and their interpretation is not always obvious. A new psychometric instrument has been developed that is capable of identifying people affected by, or at risk of, exercise addiction: the exercise addiction inventory (EAI). A preliminary report showed the EAI had good reliability and validity.

Objectives: To test further the EAI's psychometric properties and show that it would be quick and simple to administer by general practitioners.

Methods: A sample of 200 habitual exercisers were given the EAI and two existing exercise addiction scales (obligatory exercise questionnaire; exercise dependence scale). Two weeks later, another sample of 79 exercisers were administered the EAI to determine the test-retest reliability of the questionnaire.

Results: The original data from the preliminary report were reanalysed to determine the split half correlation of the EAI. This was found to be 0.84 (Guttman split-half coefficient). A correlation between weekly frequency of exercising and EAI scores was also determined, and it was found that the two variables shared 29% of the variance ($r^2 = 0.29$). The test-retest reliability of the scale was found to be very good (0.85).

Conclusions: The EAI is a valid and reliable tool which would be capable of helping general practitioners to quickly and easily identify people affected by, or at risk of, exercise addiction.

Although universally acknowledged as a healthy habit, exercise has also been recognised as having the potential to become an unhealthy obsession. Hausenblas and Symons Downs¹ reported that the most commonly used term to describe this phenomenon is exercise addiction. Excessive exercise has also been termed "dependent",² "obligatory",³ "compulsive",⁴ "abusive",⁵ and "morbid".⁶ The most popular viewpoint has been that extreme or obsessive exercising is a form of addiction.⁷ People with this addiction not only risk doing themselves serious harm physically, but are so dependent on exercise that they will put it before their family, friends, health, and career. Exercise addiction is not routinely screened for by health practitioners, probably because the instruments that are currently available take a relatively long time to administer, because the instruments that are currently available take a relatively long time to administer, their scoring may be complicated, and their interpretation is not always obvious. On the basis of Brown's⁸ general components of addictions and modified by Griffiths⁹—that is, salience, mood modification, tolerance, withdrawal, conflict, and

relapse—we devised a brief six item exercise addiction screening tool, the exercise addiction inventory (EAI).¹⁰ In this study, we explore further the EAI's psychometric properties, based on further analysis and the collection of new data.

METHOD

Two samples of habitual male and female exercisers (phase 1, $n = 200$; phase 2, $n = 79$) participated in the study. As the scope of the study was the development of a general exercise (rather than specific sport or exercise) tool, the sample included those who engaged in many different forms of exercise (team sports, aerobics, combat sports, gym, etc). The age range was 18–40 years (mean (SD) 21.24 (3.77)). In phase 1, the EAI (see table 1 for individual items, which question related to which addiction component, and scoring) was administered alongside two existing scales with good psychometric properties: the obligatory exercise questionnaire (OEQ)³ and the exercise dependence scale (EDS).¹¹ This allowed the assessment of reliability and validity of the EAI. In phase 2, the EAI was administered on its own to examine test-retest reliability.

RESULTS

The results revealed that the EAI had good concurrent validity with both the OEQ ($r = 0.80$) and the EDS ($r = 0.81$). The EAI also produced good two week test-retest reliability ($r = 0.85$). Furthermore, principal components analysis showed that the six questions represented a single component explaining 55.9% of the variation. All the factor loadings were high and very significant (table 1). Six of the participants (3%) were found to score above 24 on the EAI and to be "at risk" from exercise addiction. The results also indicated that the EAI has good internal reliability (Cronbach $\alpha = 0.84$). The split half correlation of the EAI was found to be 0.84 (Guttman split-half coefficient). A correlation between weekly frequency of exercising and EAI scores was also performed, and it was found that the two variables share 29% of the variance ($r = 0.54$, $r^2 = 0.29$).

CONCLUSIONS

This study identified 3% ($n = 6$) of the sample as being at risk of exercise addiction. This is very similar to a previous study using the EDS, which identified 2.5% of the sample as being exercise dependent.¹¹ Analysis of the EAI's psychometric properties shows it to be a valid and reliable instrument capable of quickly and easily identifying people at risk of exercise addiction, which could be of great benefit to many health practitioners including general practitioners, physiotherapists, and occupational therapists. The psychometric properties of the EAI manifested themselves in very good internal reliability, content validity, concurrent validity, and construct validity. Previous attempts to create "exercise addiction" scales have resulted in lengthy questionnaires,

Table 1 Exercise addiction inventory and individual factor loadings using principal component analysis

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Factor loading	Addiction component
Exercise is the most important thing in my life	1	2	3	4	5	0.754	Saliency
Conflicts have arisen between me and my family and/or my partner about the amount of exercise I do	1	2	3	4	5	0.610	Conflict
I use exercise as a way of changing my mood (e.g. to get a buzz, to escape, etc.)	1	2	3	4	5	0.800	Mood modification
Over time I have increased the amount of exercise I do in a day	1	2	3	4	5	0.742	Tolerance
If I have to miss an exercise session I feel moody and irritable	1	2	3	4	5	0.801	Withdrawal
If I cut down the amount of exercise I do, and then start again, I always end up exercising as often as I did before	1	2	3	4	5	0.762	Relapse

followed by complicated scoring methods which had to be analysed by an expert. The EAI takes about a minute to complete and is easily scored. This has the potential to be of great benefit to a wide variety of health practitioners given their typical daily demands. The EAI could be printed on posters in a variety of outlets including gyms, general practitioner waiting rooms, and physiotherapy clinics. Not only could the exercising public test themselves if they thought they had a problem, but the EAI could also be used quickly and efficiently by general practitioners, physiotherapists, and occupational therapists who suspect exercise addiction in a patient. The EAI provides an essential tool that would enable measures to be put in place before the problem gets out of hand, causing a great deal of physical and social damage.

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Competing interests: none declared

All participants gave written and informed consent. The study was approved by the departmental ethics committee (Nottingham Trent University).

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Accepted 21 December 2004

REFERENCES

- 1 Hausenblas HA, Symons Downs D. Exercise dependence: a systematic review. *Psychology of Sport and Exercise* 2002;**3**:89–123.
- 2 Cockerill IM, Riddington ME. Exercise dependence and associated disorders: a review. *Couns Psychol Q* 1996;**9**:119–29.
- 3 Pasman L, Thompson JK. Body image and eating disturbance in obligatory runners, obligatory weightlifters, and sedentary individuals. *Int J Eat Disord* 1998;**7**:759–69.
- 4 Lyons HA, Cromey R. Compulsive jogging: exercise dependence and associated disorders of eating. *Ulster Med J* 1989;**58**:100–2.
- 5 Davis C. Exercise abuse. *Int J Sport Psychol* 2000;**31**:278–89.
- 6 Chalmers J, Catalan J, Day A, et al. Anorexia nervosa presenting as morbid exercising. *Lancet* 1985;**1**:286–7.
- 7 Griffiths MD. Exercise addiction: a case study. *Addict Res* 1997;**5**:161–8.
- 8 Brown RIF. Some contributions of the study of gambling to the study of other addictions. In Eadington WR, Cornelius JA, eds. *Gambling behaviour and problem gambling*. Reno: University of Nevada Press, 1993:241–72.
- 9 Griffiths MD. Behavioural addiction: an issue for everybody? *Journal of Workplace Learning* 1996;**8**:19–25.
- 10 Terry A, Szabo A, Griffiths MD. The Exercise Addiction Inventory: a new brief screening tool. *Addiction Research and Theory* 2004;**12**:489–99.
- 11 Hausenblas H, Symons Downs D. How much is too much? The development and validation of the Exercise Dependence Scale. *Psychology and Health* 2001;**17**:387–404.