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EXERCISE DEPENDENCE AMONG MARATHON RUNNERS IN RELATION TO THEIR DEMOGRAPHIC AND TRAINING STATUS

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A - author of the concepts, B - author of the assumptions, C - author of the methods, D - author of the protocol

ABSTRACT

Introduction and purpose. Taking into account that endurance athletes might be at an increased risk for exercise dependence there is a need for monitoring the prevalence and correlates of this phenomenon in them. The aim of the study was assessing the prevalence of exercise addiction among marathon runners and identify its socio-demographic and training correlates. **Material and method.** A total of 132 runners ranging in age from 18–69 years old took part in the study. To assess the exercise dependence a polish version of the *Exercise Dependence Scale-21* was used. **Results.** The results suggest that being at risk for exercise dependence concerns 12% of runners and – except of withdrawal factor - is not related to sex but is related to age. No significant differences were found between training volume groups and exercise dependence. C**onclusions**. More than one on ten marathoners seem to be addicted to running suggesting the need to increase knowledge on this phenomenon in this community.

Key words: exercise addiction; exercise dependence; runners; marathon

INTRODUCTION

On one hand exercise dependence was defined as a "positive addiction" because it was thought to produce psychological and physiological profits and on the other hand as a "negative addiction" due to occurring neuroadaptation (i.e., withdrawal symptoms like nervousness, exasperation, anxiety and tolerance – the need for more frequent and longer exercise) and negative consequences for the individual (i.e., exercising despite the injuries) (Allegre et al., 2006; Rowicka, 2015).

Exercise addiction, however, is not included in the Diagnostic and Statistical Manual of Mental Disorder-V (DSM-V; American Psychiatric Association, 2013) or ICD-10 (World Health Organization, 2009), should be regarded as a category of non-substance or "behavioral" addiction included into the new DSM-V, represented by gambling addiction. This category means failure to resist an impulse, drive, or temptation to perform an act that is harmful to the person or others. As such, exercise dependence means an obsession with exercise and physical fitness that results in spending an excessive amount of time on exercising, even if it carries a health risk or spoiling relationships with other people.

Based on criteria for substance dependence included in the DSM-V (American Psychiatric Association, 2013) seven components of exercise dependence are proposed:

1) Tolerance: either the need for increasing amounts of exercise to achieve the desired results or a diminishing effect from the same amount of exercise
2) Withdrawal: experiencing negative symptoms when exercise is deprived, like anxiety, guilt, tension, restlessness
3) Intention Effect: often taking on more exercise than intended
4) Lack of Control: a persistent desire or unsuccessful effort to cutting down or controlling exercise
5) Time: spending a great deal of time in exercise-related activities like preparing for it
6) Reductions in Other Activities: giving up or reducing important social, occupational, or recreational activities because of exercise
7) Continuance: continuing exercise despite having a persistent or recurrent physical or psychological problems that are likely to have been caused or exacerbated by the exercise (Hausenblas & Symons Downs, 2002a)

The highest percentage of exercise dependency was found among people practicing endurance sports (Lodovico et al., 2019). In meta-analysis of exercise dependence research conducted in 1970-1999, in the surveyed activities, running was the most frequently examined (50%) (Hausenblas & Symons Downs, 2002b).

Previous research findings have shown positive association of exercise dependence symptoms and longer race distances (Hausenblas & Symons Downs, 2002b; Cook et al., 2013).

Excessive exercise has been found to be related to eating disorders, both as a primary or secondary factor, depending of what comes first. Both syndromes have similar etiological and psychological characteristics, the aim of both is the controlling and manipulating body composition (Allegre et al., 2006; Cook et al., 2015; Lodovico, Dubertret & Ameller, 2018).

PURPOSE

Taking into account that endurance athletes might be at an increased risk for exercise dependence there is a need for monitoring the prevalence and correlates of this phenomenon in them. Therefore the aim of the study was assessing the prevalence of exercise addiction among marathon runners and identify its socio-demographic and training correlates.

The research questions was as follows: 1) what is the prevalence of dependence symptoms among amateur marathon runners 2) what addiction symptoms - psychological or physiological - prevail among those addicted to exercise? 3) Is exercise dependence related to gender and age?, 4) Is there a relationship between exercise addiction and training volume?

MATERIAL AND METHODS

Data for the study were collected during race registration the day prior to 39. PZU Warsaw Marathon. A total of 132 runners ranging in age from 18–69 years old took part in the study. The majority of the participants were male (n=100 male, n=32 female). A demographic questionnaire was used to determine participants' gender, age, number of previously completed marathons, number of training a week, weekly mileage and years of running experience. To assess the exercise dependence a polish version of the *Exercise Dependence Scale-21* (Hausenblas & Symons Downs, 2002a) was used. The scale includes 21 items divided evenly between seven subscales, based on the DSM-IV criteria for substance dependence (American Psychiatric Association, 1994): tolerance (i.e., "I continually increase my exercise intensity to achieve the desired effects/benefits"), withdrawal symptoms (i.e., I exercise to avoid feeling irritable"), intention effect (i.e., "I exercise longer than I intend"), lack of control over one's exercising, time (i.e., "I am unable to reduce how long I exercise"), reductions in other activities (i.e., I would rather exercise than spend time with family/friends), and continuance (i.e., "I exercise despite recurring physical problems"). Each item is scored on a 6-point Likert scale ranging from 1 (never) to 6 (always). The Cronbach's α for six variables reached accepted value above the 0.60 limit (Sokołowski and Sagan, 1999) - from 0.61 for Reductions in Other Activities subscale to 0.84 for Intention Effect subscale. Only the withdrawal factor value was slightly below the accepted threshold (α=0.56), therefore results obtained in these factor should be treated in caution. The higher the score on each item the higher severity of symptom it is related to. Individuals obtaining scores of 5 to 6 on items for at least three DSM criteria are classified as "at risk for exercise dependence", scores of 3 to 4 on are classified as "nondependent symptomatic" and scores of 1 to 2 are classified as "nondependent asymptomatic". The classification of being at risk means that if the individual is not already dependent, there is a high risk onset of dependence. A high score on tolerance and withdrawal scale indicate the physiological dependence type.

In the statistical data analysis, descriptive statistics were employed. For comparison of two means, the Student's t-test was used, and in order to determine the differences between more number of variables - ANOVA with accompanied post hoc Tukey test. Additionally, eta squared as a measure of effect size was calculated. All calculations were made in the Statistica 13.1 software.

RESULTS

Descriptive statistics of the sample on exercise dependence symptoms are shown in the Table 1. As it can be seen the highest means were observed in withdrawal and tolerance, while the lowest in reduction of other activities.

Table 1. Descriptive statistics of the sample on exercise dependence symptoms

Variable	M	Median	Min	Max	SD	Skewness	Kurtosis
Withdrawal	3.65	3.67	1.00	6.00	1.13	-0.09	-0.19
Continuance	2.91	2.67	1.00	6.00	1.29	0.33	-0.68
Tolerance	3.66	3.67	1.00	6.00	1.08	-0.28	-0.05
Lack of Control	3.08	3.00	1.00	5.33	1.08	0.03	-0.63
Reductions in Other Activities	2.54	2.50	1.00	4.67	1.02	0.12	-0.92
Time	3.21	3.17	1.00	6.00	1.11	0.08	-0.60
Intention Effect	2.82	2.67	1.00	5.67	1.19	0.43	-0.55

There were no significant between-gender differences in means except for the withdrawal factor: $t(130)=-2.15$, $p=0.034$, in which male runners scored significantly higher ($M=3.54\pm1.18$) than female runners ($M=4.02\ \pm0.85$).

Based on the aforementioned criteria 12% (16 individuals – 12 male, 4 female) of study sample may be classified as at risk of exercise dependence while 56% (74 individuals – 56 male, 18 female) as nondependent symptomatic (see Figure 1). Thus in the gender groups similar proportions as in the whole sample can be observed.

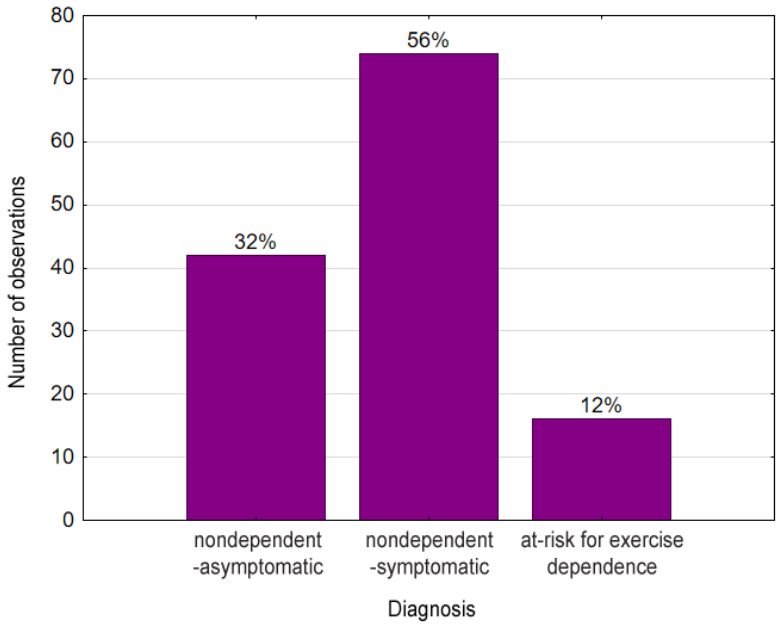

Fig. 1. Percentages of participants classified as at-risk for exercise dependent, nondependent -symptomatic, or nondependent-asymptomatic

In two diagnostic categories physiological dependence type was represent in 69% of at-risk group and in 35% of symptomatic group.

One-way analysis of variance (ANOVA) by ranks was used to examine age groups differences in the symptomatology of exercise dependence across at risk for exercise dependence, nondependent–symptomatic, and nondependent–asymptomatic exercisers (means of particular scale). Post-hoc comparisons examined a significant interaction between runners age and total mean scores of Exercise Dependence Scale. Runners aged 50 and over displayed the highest scores (Fig. 2). Also among the individuals diagnosed with at risk for exercise dependence were the oldest runners (Fig. 3). In both cases the partial eta squared value represents a moderate effect size.

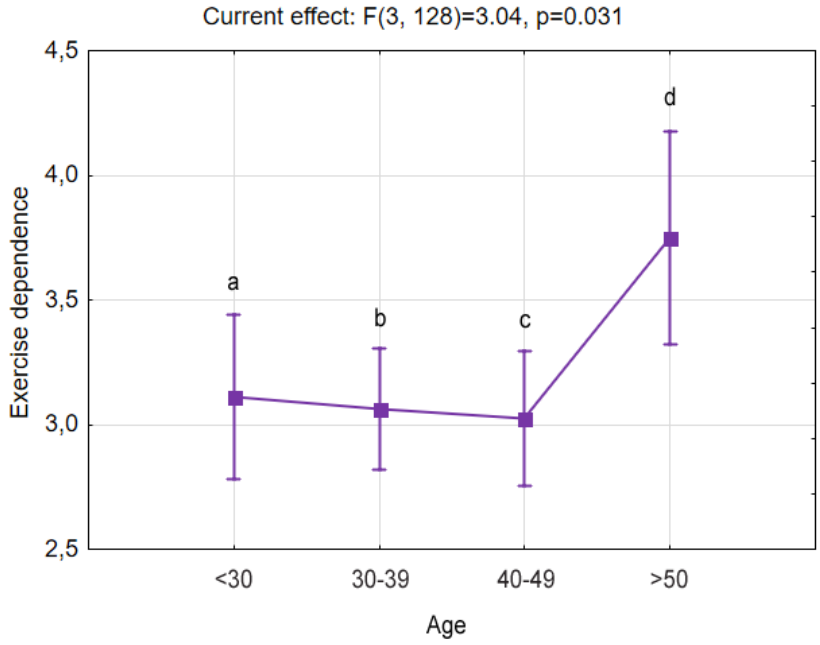

Fig. 2. Exercise dependence in age groups. Significant differences - ad: p=0.021; bd: p=0.006; cd: p=0.005; η^2=0.07

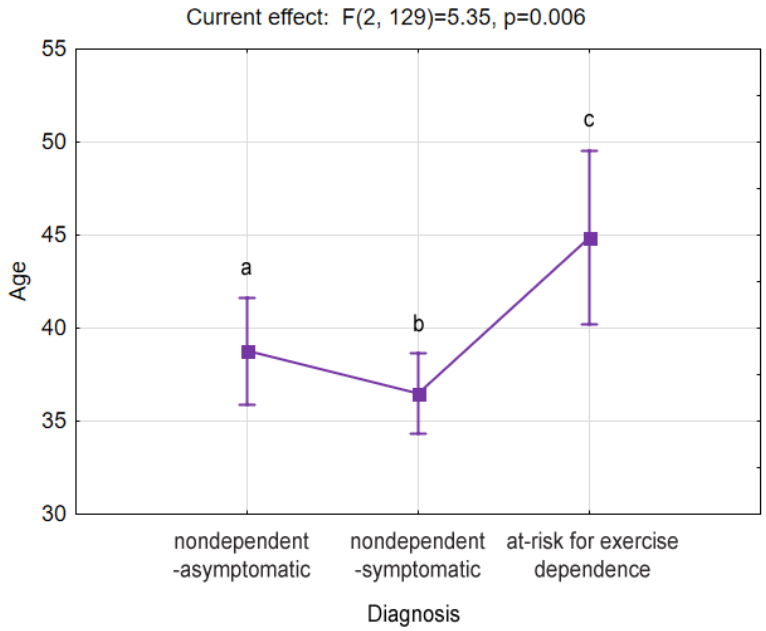

Fig. 3. Age and exercise dependence symptoms. Significant differences - ac: p=0,029; bc: p=0,002; η^2=0,08

No significant differences were found between training volume groups and exercise dependence. However planned post hoc comparisons revealed a trend towards significance in individuals who reported the highest weekly mileage. Similar situation related also do the number of workouts per week (see Fig. 4 & 5).

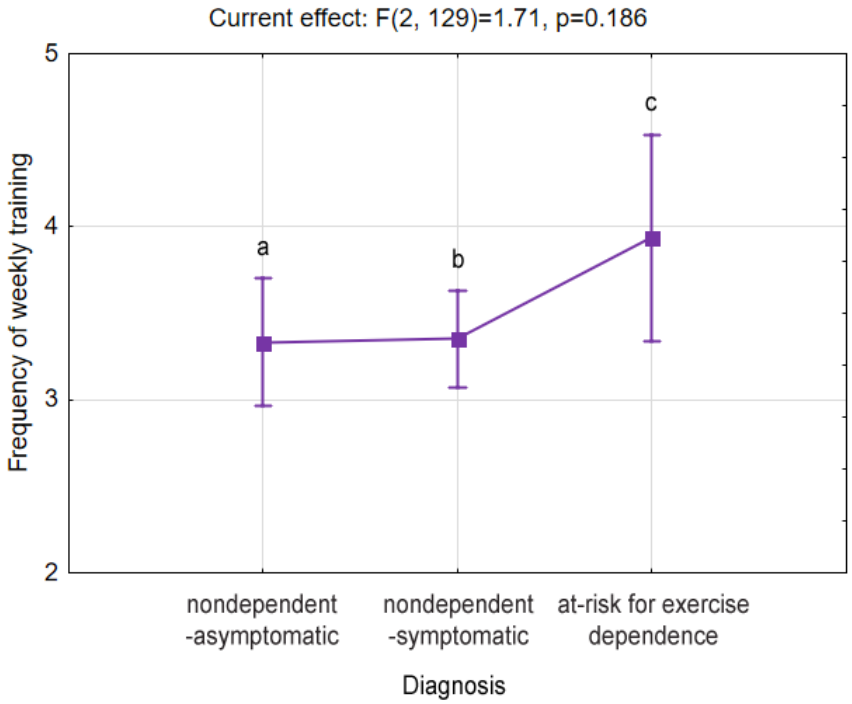

Fig. 4. Frequency of weekly training and exercise dependence symptoms. Post hoc comparisons revealed trend towards significance - ac: p=0,080; bc: p=0,090

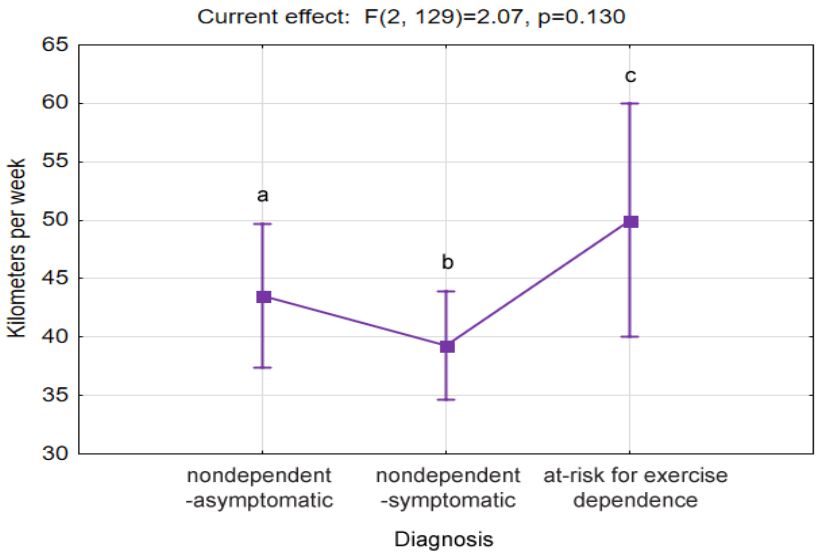

Fig. 5. Weekly training mileage and exercise dependence symptoms. Post hoc comparisons revealed trend towards significance - bc: p=0,055

DISCUSSION

The aim of this study was to investigate the association between exercise dependence and socio-demographic and training correlates of runners.

Results of the study indicate, that about one every ten amateur marathon runners may be classified as being at risk of exercise dependence, although over a half of them have some symptoms of dependence. This finding represents rather lower end of addicted exercises in people endurance sports in which values up to 20% were found (Magee, Buchanan, Barrie, 2016; Hausenblas, et al., 2004; Lodovico et al., 2019; Youngman & Simpson, 2014).

Means of particular symptoms were not significantly different between male and female runners, except from but withdrawal factor. This finding is contrary to the study of Shin & You, 2015 in which this factor was the only one that was non-significant in between gender comparisons. However it should be treated with caution because withdrawal factor had the Cronbach's α value slightly below proposed threshold of acceptable reliability of the scale. Furthermore one should bear in mind unequal number of male and female respondents.

According to previous studies (Ogles et al., 1995; Leedy, 2000; Zarauz Sancho & Ruiz-Juan, 2011) men report more time spending running than women and are more likely to be addicted to exercise (Crossman et al., 1989; Ogles et al., 1995; Szabo et al., 2013).

Mostly physiological dependence type in individuals at risk for exercise dependence is consistent with Magee, Buchanan & Barrie (2016) triathletes studies. Running and participation in marathons trainings, same as a sport such as Ironman, could lead to physical tolerance, because of large commitment and amount of time spent on exercising (Vleck et al., 2014).

Regarding obligatory exercising and age earlier studies has found younger individuals higher risk for exercise dependence (Menczel et al., 2014). Differently this study has shown a tendency to be addicted in older people group.

No statistically significant differences were found when relation between exercise addiction and training volume was considered, although statistics showed only a trend towards significance. Taking into consideration other studies, number of trainings and running kilometers are significant predictor of excessive commitment to running (Zarauz Sancho, Ruiz-Juan, 2011), same as total number of hours exercising each week, among triathletes (Youngman & Simpson, 2014). Similarly it was found that fewer trainings is associated with less exercise dependence tendency in university athletes, but not elite (Szabo, 2013).

To determine if this at-risk group is exercise dependent, clinical interviews are necessary because the Exercise Dependence Scale is a screening instrument and not a diagnostic tool. To diagnose exercise dependence should be excluded other disorders like personality disorder, obssesive-compulsive disorder or eating disorder, which may coexist with obligatory running and requires therapy focused on all found disorders.

CONCLUSIONS

Results indicate that more than one on ten marathoners seem to be addicted to running suggesting the need to increase knowledge on this phenomenon in this community.

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