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ORIGINAL ARTICLE

An Exploratory Examination of the Relationship Between Symptoms of Depression and Exercise Addiction Among Undergraduate Recreational Exercisers

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Abstract
Research has consistently demonstrated an association between depressive disorders and behavioral addictions. However, the relationship between depression and exercise addiction has rarely been investigated. The present study examined the relationship between self-reported depression and exercise addiction symptoms. A sample of 691 Spanish undergraduate leisure exercisers (59% males; $M_{age} = 21.25$ years; $SD_{age} = 2.94$) completed a self-report survey. Two regression analyses employing a maximum likelihood robust estimation method were conducted controlling for the effects of age, gender, BMI, perceived health status, exercise frequency, and risk of eating disorders. In the first regression analysis, depression symptoms ($\beta = .275$) explained a significant amount of variance in exercise addiction symptoms (33%). In the second regression analysis, exercise addiction symptoms ($\beta = .320$) explained a significant amount of variance in depression symptoms (22%). Symptoms of depression and exercise addiction may simultaneously occur among leisure exercisers. These findings suggest the need for further longitudinal research examining the temporal patterns and directionality between depression and exercise addiction.

Keywords Depressive disorders · Eating disorders · Morbid exercise · Exercise dependence · Exercise addiction

Introduction

Behavioral addictions are typically defined according to the significant impairing nature of harm and/or distress derived from persisting in a given behavior (Kardefelt-Winther et al., 2017). The inclusion of this nonsubstance form of addiction (particularly, gambling and internet gaming) in the latest (fifth) edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013) has led to an increasing interest in exploring the potential addictive nature of a wide range of everyday life activities. Examples include work, shopping (buying), sex, internet use, and exercise (Starcevic, 2016). The latter case is particularly paradoxical given the body of evidence supporting the many potential health-related benefits of regular exercise (Ashton et al., 2020; Mandolesi et al., 2018). However, it is estimated that between 3%

and 7% of regular exercisers may be at risk of developing an addictive pattern of exercise (Marques et al., 2019). In light of this evidence, research to gain better insight into this unhealthy form of exercise is needed.

An unresolved issue in the field of behavioral addictions (and more specifically exercise addiction) is discerning the extent to which these potentially dysfunctional behaviors may be conceptualized as unique psychopathological entities or, on the contrary, as comorbidities of other existing mental disorders (Cunningham, Pearman, & Brewerton, 2016; Starcevic & Khazaal, 2017). Findings from several review papers indicate depression as the psychopathological condition most closely related to a range of problematic and addictive behaviors (Elhai, Dvorak, Levine, & Hall, 2017; Starcevic & Khazaal, 2017). Three main possibilities explain the high degree of comorbidity between depression and addictive behaviors. Firstly, individuals experience a specific behavior as rewarding that may lead to adopting that behavior as a way to cope with the negative emotions inherent to depressive disorders (Baker, Piper, McCarthy, Majeskie, & Fiore, 2004). Secondly, the impairment derived from some of the elements inherent to the addictive behavior at hand (e.g., experiencing withdrawal or the emergence of intrapersonal or interpersonal conflicts) lead to experiencing increased levels of depression symptoms (Gámez-Guadix, 2014). Thirdly, that the two aforementioned scenarios occur somewhat simultaneously, so that the two conditions reinforce each other (Elhai et al., 2017).

Overall, the aforementioned arguments support the existence of a possible causal relationship between depression and exercise addiction symptoms. However, current evidence on this matter is limited to a few cross-sectional studies. Given the inconclusive nature of the findings, researchers in the field have probably not seen the need to explore the relationship longitudinally. For instance, findings from research conducted among middle-aged recreational exercisers suggest that the prevalence rates of depression may be 13% higher among those classified at high-risk versus those at low-risk of exercise addiction (Lichtenstein, Nielsen, Gudex, Hinze, & Jørgensen, 2018). Similarly, moderate relationships between self-reported scores on psychometric depression and exercise addiction scales have been found among college students (Li, Nie, & Ren, 2015). On the contrary, no differences in self-report scores of depression symptoms were reported among amateurs cyclists classified as in high-risk compared to those classified as in low-risk in terms of exercise addiction (Mayolas-Pi et al., 2017). Furthermore, a small-sized relationship was reported between depression and exercise addiction at the univariate

level among a sample comprising both recreational exercisers and professional athletes (Levit, Weinstein, Weinstein, Tzur-Bitan, & Weinstein, 2018). However, the relationship was non-significant after controlling for eating disorder symptoms, a condition that, apart from being identified as a relevant covariate of exercise addiction (Alcaraz-Ibáñez, Paterna, Sicilia, & Griffiths, 2020), has been also associated with depression (Puccio, Fuller-Tyszkiewicz, Ong, & Krug, 2016).

Two limitations of the aforementioned studies should be taken into account when proposing further research to further understand the relationship between depression and exercise addiction symptoms. A first limitation is operationalizing exercise addiction in terms of presenting low or high risk levels rather than clinically validated cut-off points (Lichtenstein et al., 2018). The present authors suggest that research should employ continuous scale scores as has been done elsewhere in this area (Alcaraz-Ibáñez, Aguilar-Parra, & Álvarez-Hernández, 2018; Alcaraz-Ibáñez, Sicilia, & Lirola, 2020; Cunningham et al., 2016; Levit et al., 2018). A second limitation is the inclusion of professional athletes (Levit et al., 2018). This is because some scholars have called into question whether the content of currently available self-report measures of exercise addiction have the capacity to reflect a truly maladaptive behavior among elite athletes, therefore studies should restrict their samples to leisure exercisers (Szabo, Griffiths, de La Vega Marcos, Mervó, & Demetrovics, 2015). However, recruiting leisure exercisers as the target population does not guarantee that the scores obtained on such measures reflect a personal and/or social harm derived from exercise instead of an over-involvement in the activity (e.g., in terms of the time devoted to it). This is important because the presence of this type of harm is an inherent characteristic of addiction (Szabo, Demetrovics, & Griffiths, 2018; Szabo et al., 2015).

One approach frequently adopted for the purpose of facilitating the distinction between a high exercise involvement and exercise addiction when examining the potential correlates of this phenomenon at the multivariate level is controlling for exercise volume, for instance, on the basis of exercise frequency or hours of practice within a given time-period (Alcaraz-Ibáñez et al., 2018; Alcaraz-Ibáñez, Sicilia, et al., in press; Sicilia, Alcaraz-Ibáñez, Lirola, & Burgueño, 2017; Sicilia, Alcaraz-Ibáñez, Lirola, Burgueño, & Maher, 2018). A complementary approach would be to control for some kind of health indicator. In support of this possibility, potential healthy habits such as following a balanced diet or reducing tobacco and alcohol consumption have been found among individuals showing high levels of exercise addiction symptoms (Lejoyeux, Avril,

Richoux, Embouazza, & Nivoli, 2008). Similarly, there is evidence suggesting that sedentary individuals report lower levels of perceived health than regular exercisers irrespective of the level of exercise addiction symptoms shown by the latter group (Mayolas-Pi et al., 2017). Despite the plausibility of the latter argument, to the best of our knowledge, there is no precedent for the employment of a health indicator when examining the correlates of exercise addiction at the multivariate level.

Consequently, the present study examines the relationship between symptoms of depression and exercise addiction on the basis of a three-fold premise. Firstly, the likely bidirectional nature of the relationship between behavioral addictions and depression and, consequently, of the relationship under consideration (Männikkö, Ruotsalainen, Miettunen, Pontes, & Kääriäinen, 2020). Secondly, the fact that healthy exercise and exercise addiction share some common attributes (Freimuth, Moniz, & Kim, 2011) and, as a result, the need of controlling for some of them, for instance, exercise frequency or perceived health status (Alcaraz-Ibáñez et al., 2018; Mayolas-Pi et al., 2017; Sicilia et al., 2018). Thirdly, the need to take into account some of the potential sociodemographic covariates that may influence the variables under investigation, as may be the case with gender (Mojtabai, Olfson, & Han, 2016; Rudolph, 2018), age (Alcaraz-Ibáñez et al., 2018; Sutin et al., 2013), and body mass index (BMI; Richard, Rohrmann, Lohse, & Eichholzer, 2016; Sicilia et al., 2018), as well as being at risk of an eating disorder (Alcaraz-Ibáñez, Paterna, et al., 2020; Puccio et al., 2016). In view of the aforementioned evidence, it is expected that symptoms of depression and exercise addiction will be positively associated with each other. This relationship is expected to be found (i) after controlling for several potentially relevant variables in this context (i.e., exercise frequency, perceived health status, gender, age, and BMI), and (ii) irrespective of which of these symptoms are considered as independent or dependent variables(in the latter case because the potential bidirectional nature of their relationship and the cross-sectional nature of the present study).

Method

Participants

The sample comprised 691 undergraduate students who were regular exercisers (42% females) enrolled in a Spanish public university. ‘Regular exercisers’ were defined as those exercising at least once a week in their leisure time at the time when the study was conducted (Lichtenstein et al., 2018). Participants ranged in age from 18 to 37 years

(*M*=21.52, *SD*=3.16) and in BMI from 16.41 to 34.63 (*M*=22.94, *SD*=2.76). Participants identified themselves as White/Caucasian (94%), Maghrebi (4%) and Latin (2%).

Measures

Exercise addiction. This was assessed with the Spanish version (Sicilia, Alías-García, Ferriz, & Moreno-Murcia, 2013) of the Exercise Addiction Inventory (EAI; Terry, Szabo, & Griffiths, 2004). Scored on a 5-point scale from 1 (*totally disagree*) to 5 (*totally agree*), the six items comprising this instrument (e.g., "Conflicts have arisen between me and my family and/or my partner about the amount of exercise I do") reflect the behavioral addiction criteria proposed by Griffiths (2005). Evidence in support of the psychometric properties of the EAI in the Spanish context has been provided (Sicilia et al., 2013). In the present study, the composite reliability of the EAI was very good (ρ=.80; Raykov, 2004).

Depression. This was assessed with the Depression sub-scale of the Spanish version of the Brief Symptom Inventory-18 (BSI-18; Derogatis, 2000). Scored on a 5-point scale from 0 (*not at all*) to 4 (*extremely*), the 6 items comprising this instrument assess distress derived from depression symptoms of apathy, sadness, self-deprecation, anhedonia, loss of hope and suicidal ideation in a seven-day period. Evidence in support of the psychometric properties of this instrument in the Spanish context have been provided (Andreu et al., 2008; Galdón et al., 2008). In the present study, the composite reliability of the Depression sub-scale was excellent (ρ=.91).

Risk of eating disorders. This was assessed with the Spanish version (Garcia-Campayo et al., 2005) of the SCOFF questionnaire (Morgan, Reid, & Lacey, 1999). Scored dichotomously (i.e., no/yes), the five items comprising this instrument reflect key characteristics of anorexia and bulimia nervosa such as loss of control over eating or food intrusive thoughts. Two or more positive responses suggest being at risk of eating disorder (Morgan et al., 1999). Evidence in support of the use of the SCOFF as an screening instrument for risk of eating disorders in the Spanish context have been provided (Garcia-Campayo et al., 2005).

Exercise frequency. This was assessed with the following two items proposed by Prochaska, Sallis, & Long (2001): (i) "Over the past 7 days, on how many days were you physically active for a total of at least 30 min per day?" and (ii) "Over a typical or usual week, on how many days are you physically active for a total of at least 30 min per day?". Consistent with previous research in the field of exercise addiction, a composite score

from these two items was employed (Alcaraz-Ibáñez, Sicilia, Dumitru, Paterna, & Griffiths, 2019). In the present study, the composite reliability was excellent (ρ=.92).

Perceived health status. This was assessed using the Spanish version (Alonso, Prieto, & Antó, 1995) of the SF-1 derived from the Health Status Questionnaire Short Form (Ware Jr & Sherbourne, 1992). Scored on a 5-point scale ranging from 0 (*excellent*) to 5 (*poor*), this single item ("In general, would you say your health is…") provides an assessment of general health. Once reverse-scored, higher scores reflect better perceived health status. The high predictive capacity of the SF-1 concerning health-related quality of life has been has been previously demonstrated (McHorney, Ware Jr, & Raczek, 1993).

Demographics. Participants self-reported their gender, age, ethnicity, height and weight, with the latter two being employed to compute BMI (kg/m^2).

Procedure

Following ethical approval from first author's institutional Ethics Committee, participants were recruited in classroom settings. After being briefly informed about the study's content (exercise behavior and health), as well as about the voluntary, anonymous, and non-rewarded nature of their participation, those who agreed to participate and met the inclusion criteria in terms of being considered as regular exercisers (98%) completed a paper-and-pencil survey. The instruments were counterbalanced by presenting two different versions of the survey. Participants needed around 8 minutes to complete the survey.

Statistical analyses

Firstly, descriptive statistics and bivariate correlations among the study variables were computed. Additionally, differences in study variables across gender and being or not at risk of eating disorders were computed an interpreted in terms of its effect size (i.e., *d*; Cohen, 1988). Next, the measurement model for the three latent variables specified (symptoms of exercise addiction/depression and exercise frequency) were examined utilizing confirmatory factor analyses (CFAs) by employing Mplus 7 (Muthén & Muthén, 2012). Given the ordered polytomous nature of the variables under examination, the CFA was conducted by employing the weighted least squares mean and variance-adjusted (WLSMV) robust estimation method (Li, 2015). Missing values (less than 0.5%) were handled using imputation methods implemented in Mplus 7. Values for Comparative Fit Index (CFI) above .96, for Root Mean Square Error of Approximation (RMSEA) below .06, and for weighted root mean residual (WRMR) around 1.00 or less indicate excellent model fit for the WLSMV estimation method (Yu, 2002). Latent factor scores for

symptoms of exercise addiction/depression and exercise frequency were derived from the described CFA by employing the FSCORES function of Mplus 7. These latent factor scores were subsequently employed when exploring the multivariate relationships of interest. This approach allowed us to take measurement errors into account without the need of specifying a model consisting of latent variables. More specifically, the latter would have meant having a case-to-parameter ratio below the minimum usually accepted (Kline, 2011). Therefore, symptoms reflecting exercise addiction and depression were respectively considered as dependent variables in two regression analyses conducted in Mplus 7 while controlling for age, gender, BMI, perceived health status, exercise frequency, and risk of eating disorders. Given the presence of both dichotomous (e.g., gender and being or not being at risk of eating disorders) and continuous variables (e.g., latent factor scores), as well as the potential nested character of the data (i.e., they were collected in several classroom environments), these regression analyses were conducted by employing the maximum likelihood robust (MLR) estimator method and the COMPLEX function of Mplus.

Results

Descriptive statistics, bivariate correlations, and differences across study variables in terms of gender and risk of eating disorders are shown in Table 1. Participants showed (i) low levels of depression symptoms, (ii) mid-levels of exercise frequency and exercise addiction symptoms, and (iii) high levels of perceived health status. According to the screening cut-off point proposed for the SCOFF (Morgan et al., 1999), 18% of the participants were classified as being at risk of eating disorders. Exercise addiction symptoms were positively correlated with BMI, perceived health status, exercise frequency, and depression symptoms. This latter variable was negatively correlated with both exercise frequency and perceived health status. In the case of depression symptoms, small to medium-sized differences favoring females and those classified as at risk of eating disorders were found. In the case of exercise addiction symptoms, small differences favoring males and those classified as at risk of eating disorders were found.

The following goodness-of-fit indices were found for the measurement model: $\chi^2 = 205.523$, $df = 74$, $\chi^2/df = 2.777$, $p < .001$; CFI=.988; RMSEA = .051 (90%CI=.042, .059), $p = .443$; WRMR=1.055. The results of the first regression analysis (Table 2) showed that being male, perceived health status, exercise frequency, being at risk of eating disorders, and depression symptoms positively explained significant variance in exercise addiction

symptoms. The results of the second regression analysis (Table 2) showed that being male, perceived health status, and exercise frequency (all negatively), and being at risk of eating disorders and exercise addiction symptoms (all positively) explained significant variance in depression symptoms. The independent variables included in the models explained 33% in the case of exercise addiction symptoms and 22% in the case of depression symptoms.

Discussion

The present study adds to the existing body of knowledge by providing empirical evidence in support of the association between self-reported symptoms of depression and exercise addiction among a sample of undergraduate regular leisure exercisers. In particular, by suggesting that this relationship may occur irrespective of potential confounding variables such as age, gender, BMI, perceived health status, exercise frequency, or being at risk of eating disorder. Evidence from the present study contributes to expanding the number of addictive behaviors previously associated with depression (Elhai et al., 2017; Starcevic & Khazaal, 2017), and suggests the need for further longitudinal research to clarify the temporal relationship between these two disorders.

Findings from the present study are consistent with those reporting low-to-moderate relationships between depression and exercise addiction symptoms at the univariate level (Levit et al., 2018; Li et al., 2015; Lichtenstein et al., 2018). However, they differ from those reported in previous research examining the relationship under consideration by employing multivariate techniques in which exercise addiction symptoms were considered as the dependent variable (Levit et al., 2018). In particular, the data show that not only being at risk of eating disorders but also experiencing depression symptoms may contribute to explaining additional variance of exercise addiction symptoms at the cross-sectional level. A plausible explanation for these differences could be the differentiated nature of the sample (i.e., professional and leisure exercisers in the study by Levi et al. 2018 as opposed to only leisure exercises in the present one). These findings suggest that adopting exercise as a coping strategy in the face of the range of negative emotions inherent to depression could be more common among leisure exercisers than professional athletes. This is because for professional athletes, exercise is not a recreational activity in which to find relief from specific life stressors but is their daily job.

Some clinical and practice implications may be drawn from the observed findings. Firstly, the need to move away from the concept that exercising is inherently beneficial in terms of health promotion (Aggestål & Fahlén, 2015). On the contrary, the results here suggest that the potential health-related benefits derived from exercise may be compromised in the event that such activity becomes addictive (Ashton et al., 2020; Mandolesi et al., 2018). Similarly, it has been suggested that the fact that an initially pleasurable activity such as exercise may contribute to individuals' good quality of life (for instance, in terms of reduced depression symptoms) does not preclude the possibility that this ultimately becomes in the life's main organizing principle, thus leading to impairments in daily functioning and, ultimately, to the emergence of depression symptoms (Freimuth et al., 2011).

Consequently, the results of the present study raise the need to increase awareness of exercise addiction and depression symptoms by health and exercise professionals. This is because the presence of these symptoms could raise the possibility of either exercise being adopted as a means of getting short-term relief from a distressed emotional state (Alcaraz-Ibáñez et al., 2018) or exercise being a source of emotional distress characterizing depression that, in both cases, may ultimately compromise the potential health-related benefits derived from such a behavior (Ashton et al., 2020; Mandolesi et al., 2018). These two possibilities are particularly relevant when exercise is employed as a non-pharmacological strategy to mitigate depression symptoms in sedentary individuals (Béland et al., 2020; Gordon et al., 2018). In particular, it cannot be ruled out that an over-reliance on exercise as a means of coping could lead to the return of the initial depression symptoms in the long-term. However, the latter is just a hypothesis whose feasibility should be investigated in further study.

A second important implication concerns the fact of having accounted for the effect of perceived health status when examining the relationship between symptoms of exercise addiction and its potential correlates. The existence of a positive relationship between these two variables suggests that individuals reporting exercise addiction symptoms tend to perceive themselves as healthy. This is not surprising considering that some symptoms of exercise addiction (at least as they are operationalized in the scale used in the present study) may not necessarily reflect the harm inherent to addictive processes (Szabo et al., 2015) but physiological and likely health-inducing adaptations derived from being involved in such an activity (Alcaraz-Ibáñez et al., 2018). A clear example of the latter relates the tolerance criterion (the need to increase the amount of

exercise over time to achieve the desired mood modifying effects) just in terms of increasing the amount of daily exercise over time (Terry et al., 2004). Consequently, these findings reinforce the notion that exercise addiction may share some of the attributes of healthy exercise (Freimuth et al., 2011), therefore underlining the need to control not just the indicators of exercise behavior (e.g., in terms of exercise frequency; Alcaraz-Ibáñez et al., 2018; Sicilia et al., 2018) but also the perceived health status when examining the correlates of this potential disorder at the multivariate level.

Two main limitations of the present study should be noted. First, the cross-sectional and self-report nature of the data collected. Consequently, further research aimed at elucidating the temporal relationship between exercise addiction and depression may benefit from employing longitudinal designs, as well as complementary (e.g., external corroboration by others) or more reliable (e.g., clinical interview) assessment methods. The latter is particularly applicable to depression and eating disorders since the diagnostic criteria for both disorders have been defined (American Psychiatric Association, 2013). It could be also applied to BMI, exercise frequency, or health status, in the latter two cases, by employing not only subjective but also objective indicators. Examples of the latter are data derived from accelerometers or physiological indicators of health such as fitness level or those suggesting cardio metabolic risk (Poitras et al., 2016). A second important limitation relates to the very specific nature of the participants (i.e., a non-clinical sample of undergraduate students). A logical next step would be to replicate the present study considering populations in which particularly high levels of exercise addiction symptoms have been reported, such as fitness club users or endurance exercisers (Allegre et al., 2007; Marques et al., 2019). Similarly, considering clinical populations in terms of eating pathologies is also of interest. In particular, because of evidence suggesting a high degree of comorbidity between eating pathologies and depression (Puccio et al., 2016), as well as a stronger association between exercise addiction and symptoms of eating pathologies in those clinically diagnosed with the latter (Alcaraz-Ibáñez, Paterna, et al., 2020).

In summary, the results of the present study show that, irrespective of gender, age, BMI, or being at risk of eating disorder, self-reported depression and exercise addiction symptoms appear to be moderately related among leisure exercisers. These findings suggest that depression and exercise addiction symptoms may co-occur, therefore suggesting the need of further research to more clearly delineate the sociodemographic

or cognitive variables that may explain such circumstances and their temporal patterns and directionality.

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Table 1

Means (M), standard deviations (SD), and bivariate correlations of main study variables

	Gender					Risk of eating disorders														
	Women (*n*=291)		Men (*n*=400)			No (*n*=566)		Yes (*n*=125)			Full sample (*N*= 691)									
	M	*SD*	*M*	*SD*	*d*	*M*	*SD*	*M*	*SD*	*d*	Range	*M*	*SD*	γ_1	γ_2	1	2	3	4	5
1. Age	21.40	2.93	21.62	3.31	0.07	21.56	3.10	21.38	3.43	0.06	18-37	21.52	3.16	1.77	4.24	-				
2. BMI	22.24	3.09	23.44	2.38	0.44	22.55	2.55	24.67	3.01	0.75	16.41-34.63	22.94	2.76	0.58	0.77	.08*	-			
3. Perceived health status	3.85	0.75	4.12	0.65	0.39	4.07	0.67	3.73	0.80	0.46	1-5	4.01	0.70	-0.39	0.40	-.05	-.16***	-		
4. Exercise frequency	3.47	1.50	4.19	1.57	0.47	3.92	1.59	3.73	1.54	0.12	1-7	3.88	1.58	0.06	-0.85	-.06	.02	.21***	-	
5. Depressive symptoms	0.94	0.90	0.65	0.72	0.36	0.66	0.71	1.30	1.02	0.71	0-4	0.77	0.81	1.35	1.60	.04	.03	-.18***	-.12**	-
6. Exercise addiction symptoms	2.42	0.85	2.76	0.70	0.44	2.57	0.79	2.81	0.75	0.31	1-5	2.62	0.79	0.10	-0.27	-.03	.11**	.15***	.46***	.21***

Note. BMI=Body mass index, *d*=effect size of differences, γ_1=skewness, γ_2=kurtosis.

*p<.05; **p<.01; ***p<.001.

Table 2

Linear regression analyses predicting depression and exercise addiction symptoms

	Model 1: R^2= .33 DV: Exercise addiction symptoms					Model 2: R^2= .22 DV: Depression symptoms				
	β	95% CI		*SE*	*p*	β	95% CI		*SE*	*p*
		LL	UL				LL	UL		
Age	-.018	-.096	.060	.040	.648	.045	-.038	.128	.042	.285
Gender	.172	.076	.268	.049	.000	-.148	-.249	-.047	.051	.004
BMI	.041	-.044	.126	.043	.345	-.080	-.165	.005	.042	.065
Perceived health status	.101	.031	.170	.036	.005	-.126	-.194	-.059	.035	.000
Exercise frequency	.434	.365	.503	.035	.000	-.189	-.258	-.119	.036	.000
Risk of eating disorders	.111	.029	.194	.042	.008	.246	.173	.319	.037	.000
Depressive symptoms	.275	.207	.342	.034	.000	-	-	-	-	-
Exercise addiction symptoms	-	-	-	-	-	.320	.244	.396	.039	.000

Note. DV=Dependent variable, β=Standardized regression coefficients, CI=Confidence interval, LL=Lower limit, UL=Upper limit, *SE*=Standardized error. Being woman (in the case of gender) and classified as "not at risk" (in the case of eating disorders) were taken as reference categories for dichotomous independent variables.