

The role of gender and age in the development of physical exercise dependence in endurance sports

El rol del género y la edad en el desarrollo de la dependencia al ejercicio físico en deportes de resistencia

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Abstract

Exercise dependence is characterized by a lack of ability to resist the urge to continue exercising despite the negative and serious consequences it has on both mental and physical health and in various areas of life. There is no consensus on whether gender is associated with a risk factor for the development of exercise dependence. In the case of age, we found more agreement among authors highlighting youth as a risk factor. The objectives of this study were to analyze gender and age differences in the exercise dependence, emotional regulation, affect, motivation to practice exercise and exercise identity. A mixed method of data collection was used, through quantitative instruments and qualitative strategies, focus groups. Gender differences were found in the symptoms of exercise dependence, which can be used to identify specific maladaptive thoughts and beliefs and apply them in individualized therapeutic interventions.

Keywords

Exercise dependence; Gender; Age; Endurance sports.

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Resumen

La dependencia al ejercicio físico (EF) se caracteriza por la falta de capacidad de resistir el impulso de continuar ejercitándose a pesar de las consecuencias negativas y graves que genera tanto en la salud mental como física y en diversas áreas de la vida. No hay consenso sobre si el género está asociado a un factor de riesgo para el desarrollo de la dependencia al EF. En el caso de la edad, encontramos más acuerdo entre los autores destacando la juventud como factor de riesgo. Los objetivos de este estudio fueron analizar las diferencias de género y edad en la dependencia al EF, la regulación emocional, el afecto, la motivación de práctica e identidad deportiva. Se utilizó un método mixto de recogida de datos, a través de instrumentos cuantitativos y estrategias de tipo cualitativo, los grupos de discusión. Se encontraron diferencias de género en los síntomas de la dependencia al EF, las cuales pueden emplearse para identificar los pensamientos y creencias desadaptativos específicos y aplicarlas en las intervenciones terapéuticas individualizadas.

Palabras clave

Dependencia al ejercicio físico; Género; Edad; Deportes de resistencia.

I. INTRODUCTION

Addictive behavior is defined as the difficulty for controlling a behavior associated to an activity, regardless of the negative consequences it may origin (Sellman, 2016). Exercise dependency (ED) is characterized by the lack of ability to resist the impulse to continue exercising in spite of having negative and severe consequences in mental and physical health (Berczik et al., 2012). A recent systematic review (Colledge et al., 2020) compared symptomatology of excessive and out of control exercise with gambling disorder, which is actually the only behavioral addiction recognized in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; DSM-5; APA, 2013). Colledge et al. (2020) suggested ten diagnostic criteria for ED: increase of

volume, negative affect, inability to reduce time and quantity, worry, exercising as a way of coping, continuing with exercise in spite of being injured, reducing other activities, jeopardizing personal relationships, continuing with exercise in spite of the consequences, and feeling guilty when the individual is not exercising.

In several theoretical models, ED is related with emotion regulation (Szabo, 1995; Egorov & Szabo, 2013). It has been proposed that exercising could be a mean for reducing or avoiding unpleasant emotions and for improving emotional states (Griffiths, 2005). Kun et al. (2022) found that emotion regulation difficulties had a mediating role among psychological uneasiness and ED. In this sense, emotion regulation has been identified as a key component



of addictive behaviors, since they may be related to difficulties for modulating negative (Brooks et al., 2017). Lassner et al. (2022) found that ED was associated with negative affect. Also, Dreier et al. (2021) suggested that the use of exercise for regulating negative affect was related with a combination of emotion regulation difficulties and compulsivity (APA, 2013).

In the same lane, several experts associate identification with exercise with mood disorders, dependency, and substance abuse, as well as psychosocial isolation and a restricted personal identity (Horton & Mack, 2000; Pummell et al., 2008). Burke & Stets (2009) highlight that exercise can be addictive for those individuals whose self-esteem depends on the identification of themselves as a sportsperson. Thus, individuals with a strong identification with exercise may have a greater probability of developing an addictive behavior related with exercise (Berczik et al., 2012). While analyzing the relationship of identification with exercise and ED, social, sports and cultural context of the type of exercise that is practiced (Kerr et al., 2007). Several authors have found a relationship between ED and practicing long-distance and endurance sports (Latorre et al., 2016).

It is important to highlight as well the role of motivation to explain ED, since among the main motivations for a healthy practice of physical exercise we can find the aim of improving positive affect and alleviating stress and negative affect (Szabo et al., 2018). The specific behaviors that an individual acquires for regulating emotions are related to perseverance and planification of exercise, as well as behaviors originated as a consequence of inner

emotional urgencies related to alcohol consumption or binge eating (Dreier et al., 2021). Motivation impacts directly in the motives for practicing physical exercise (Latorre et al., 2016), and previous studies show that motivational facets such as introjected regulation, identified regulation, integrated regulation or external regulation may predict ED (González-Cutre & Sicilia, 2012; Hamer et al., 2002; Parastatidou et al., 2014; Sicilia et al., 2018).

Regarding sociodemographic factors related to ED, the role of sex and age has been highlighted. In the case of sex, there is no consensus in previous research on whether sex might be a risk factor for developing ED. Some authors consider males to be at a higher risk (Dumitru et al., 2018), while other authors affirm that females may have a greater risk for developing ED (Pierce et al., 1997). Alcaraz-Ibáñez et al. (2022) suggest that the variability of the differences among men and women depends on the instruments that are used to measure to assess the risk of ED. In the case of age, there is a greater agreement among authors, who highlight young age to be a risk factor for ED (Alcaraz-Ibáñez et al., 2018; 2019).

This research aims to: a) analyze sex differences in ED, emotion regulation, affect, sports motivation and identification with exercise, b) and analyze the perceptions of individuals related to ED, emotion regulation, affect, sports motivation, and identification with exercise in association with life cycle.



METHODS

This research used an hermeneutic-interpretative method, since it aims to understand the studied phenomenon related with the beliefs, meanings, interpretations and experiences of implied individuals (Denzin & Lincoln, 2012). A multimethod or mixed method perspective was used. Fetters et al. (2013) argue that the integration of quantitative and qualitative methods improves. This research combines quantitative and qualitative data following the proposal of Bericat (1998), that is, it tries to deepen on the meanings of the results stemming from quantitative techniques through the use of qualitative techniques.

Instruments

Exercise dependency. The Exercise Dependence Scale-Revised (EDR-R; Downs et al., 2004), adapted to Spanish by Sicilia & González (2011). This instrument assesses the risk of developing ED. The reliability of this instrument is adequate, with a value of the alpha of Cronbach of .92 for the total scale and .68-.85 for the subscales.

Difficulties of emotion regulation. Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). Spanish adaptation by Hervás & Jódar (2008). This scale measured difficulties of emotion regulation through five factors: 1) Lack of emotional awareness; 2) Non-acceptance of emotional; 3) Lack of emotional clarity; 4) Difficulties engaging in goal-directed behavior; 5) Lack of emotional control. Reliability of the original scale is optimal, with a value of the alpha of Cronbach of .93 in the total scale, and .73-.93 in the subscales.

Positive and negative affect. The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988), adapted to Spanish by López-Gómez, Hervás & Vázquez (2015), was used to evaluate affect in two dimensions: positive and negative. The reliability of the original scale is optimal, with a Cronbach's alpha of .92 for positive affectivity and .88 for negative affectivity.

Identification with exercise. Exercise identity Scale (EIS; Anderson & Cyshosz, 1994) adapted to Spanish by Modrono et al. (2010). It measures the importance of physical exercise for the self-concept of individuals that practice physical exercise. It presents satisfactory levels of reliability, with an alpha of Cronbach value of .96 and a test-retest reliability of .90 after a week.

Sports Motivation. Sport Motivation Scale (SMS; Pelletier et al., 1995) adapted into Spanish by Balaguer et al. (2007). This instrument measures the reasons for which individuals practice sports. It comprises three factors: intrinsic motivation (intrinsic motivation to know; intrinsic motivation to experience stimulation and intrinsic motivation to accomplish things); extrinsic motivation (identified regulation, introjected regulation and external motivation) and amotivation. The reliability of the original scale is adequate with a value of .82.

The qualitative data was obtained through focus groups, that is, the reflections of a group of individuals in a common space were collected (Kamberelis & Dimitriadis, 2005).



Participants

Quantitative data: the sample comprised a convenience sample of 375 endurance sports practitioners [32.5% women ($n=122$) y 67.5% men ($n=253$)] between 19 and 72 years old ($M = 38.96$, $DT = 10.87$).

Qualitative data: 2 focus group were conducted, one of them with sportswomen ($n=8$) and the other one with sportmen ($n=6$). Participants represented the same profile of endurance sport amateur and leisure-recreative practitioners, with a mean age of 45 years old to guarantee a long sport career.

Procedure

Data collection was sequenced. First, qualitative data was collected, and then focus groups were conducted. In both cases participants were informed of the aims of the study and informed consent was requested. Contact data of the main research was provided. The procedure was approved by the Ethics committee of the University of the authors.

Data analysis

Quantitative data was analyzed with SPSS 28.0 statistical package. Mean differences in ED, difficulties of emotion regulation, negative and positive affect, identification with exercise and sports motivation as a function of sex were analyzed with t test. Next, correlation among age, ED, difficulties of emotion regulation, positive and negative affect, identification with exercise and sports motivation was measured through Pearson's r .

Qualitative analyses were conducted with content analysis technique with Atlas.ti 22 software. Qualitative data underwent a deductive and inductive analysis of content through a single study matrix. The codification of the text was carried out in a cyclical process of constant comparison until the meaning matrix was saturated, at which point the end of the analysis was marked. In this point, inductive categories emerged, which were analyzed as a function of frequencies and interactions.

4. RESULTS

Quantitative data analyses (Table 1) show that men had greater scores in ED (total dependency, tolerance, time, continuance, reduction of other activities and intention effects).

In congruence with quantitative data, qualitative data shows that both men and women had the higher scores in "exercise dependency" category in the analysis content. The most repeated symptoms of ED were vinculated to "continuance" category (maintaining the practice of physical exercise in spite of psychological or physical consequences) and the "reduction of other activities" (reducing social, recreative or professional activity for practicing physical exercise): "...I can't, I can't stop ... How could I be without practicing my swimming..." (MP6). "I have reached a point in which I directly quit other things for practicing sports, but I am clear about it, and it does not pose a difficulty for me... Going to dinner and having a drink... I pass!" (HP2). This reduction manifests in significant moments such as work or even holidays: "Me too, I have changed activities, and I lie about it" (MP5).



Table 1. Mean differences in exercise dependency, difficulties in emotion regulation, positive and negative affect, identification with exercise and sports motivation as a function of sex

	Male (n = 253)		Female (n = 122)		t(gl)
	M	DT	M	DT	
1. ED- Total	52.25	18.46	46.67	17.22	2.802(1,373)*
2. ED-Tolerance	9.67	4.37	7.72	3.68	4.514(1,279.575)*
3. ED- Withdrawal	7.92	4.23	8.33	3.84	-0.916(1,373)
4. ED - Time	9.34	3.91	7.84	3.80	3.515(1,373)*
5. ED-Continuance	6.83	3.56	6.07	3.03	2.157(1,276.829)*
6. ED – Intention effects	5.84	2.73	5.08	2.71	2.523(1,373)*
7. ED – Lack of control	6.60	3.35	6.16	3.22	1.219(1,373)
8.ED – Reduction	6.01	2.63	5.44	2.68	1.963(1,373) *
9. ER - Total	56.34	18.28	57.98	18.74	-.807(1,373)
10. ER – Lack of awareness	9.60	3.52	8.97	3.45	1.631(1,373)
11. ER – Non-acceptance	13.62	5.78	14.72	6.03	-1.696(1,373)
12. ER- Lack of clarity	7.92	3.48	7.90	3.05	.041(1,373)
13. ER- Interference	9.29	3.48	9.42	3.64	-.343(1,373)
14. ER – Lack of control	15.89	6.68	16.95	7.19	-1.395(1,373)
15. Positive affect	27.17	7.01	26.22	7.26	1.207(1,373)
16. Negative affect	7.73	5.97	9.32	6.73	-2.326(1,373) *
17. Identification with exercise	49.18	10.50	43.24	13.68	4.231(1,192.101) *
18. SM-Total	108.209	29.84	97.42	30.89	3.242(1,373) *
18. IM- Total	58.52	17.03	52.42	19.09	2.999(1,216.382) *
19. EM- Total	42.05	14.27	37.56	13.46	2.903(1,373) *
20. IM-Know	18.41	6.50	16.16	7.03	3.057(1,373) *
21. IM-Experience	21.15	5.66	18.97	6.38	3.216(1,215.600) *
22. IM-Accomplishing things	18.95	6.18	17.28	6.91	2.261(1,217.048) *
23. EM-Identified	15.64	6.19	14.50	5.91	1.695(1,373)
24. EM – Introjected	15.98	5.64	14.80	5.88	1.879(1,373)
25. EM- External	10.42	5.21	8.26	4.43	4.166(1,277.042) *
26. SM-Amotivation.	7.63	4.63	7.43	4.38	.394(1,373)

* p = < .05 ED= Exercise dependency. ER = Emotion regulation SM = Sports motivation; IM= Intrinsic motivation; EM = Extrinsic motivation.



[I'm in a life period in which I think that yes, I would renounce to go to a place if I don't have the possibility of practicing a physical activity that satisfies me... It is a part of my life and enjoyment, the other motivations should be very important to make me renounce to sports] (HP2).

ED is related among men with the category "contribution" (support or proposition that sports provide to the person) and represents the second category with the greater number of iterations. In this sense, it is interesting to note that "exercise dependency" and "contribution" had a high a similar frequency among men (61 and 59 respectively), and the contributions were mostly linked to positive aspects, such as this participant expresses:

[It contributes with so many things that you may mention some, but you leave many unsaid...adrenaline, motivation, health... it is a mixture of everything, that is why it is so important in our lives. It allows me to grow...propose challenges to myself...be disciplined...reach to many people. It can be said that, without sports, I would be worse] (HP2).

ED among male participants can be understood by the great (positive) contribution that physical exercise poses for them in their daily life. However, among women "exercise dependency" category was high, but the contribution was much less common, with a frequency of 24. Quantitative results (Table I) showed that women had greater scores in negative affect than men, which may help to understand why (positive) "contribution" is not so mentioned among them: "It is unavoidable...I had very bad times" (MP1); "If I don't practice sports, I feel bad... and I feel angry at everybody (...) it is frustrating" (MP6).

Another remarkable facet of "contribution" is the great number of interactions it has with other categories, such as "benefits for physical health", "benefits for mental health", "social benefit", "self-care", "energy", "fun", "self-improvement", "discipline", "learning", "problem-solving", "equilibrium", "order", and "harms". This shows how rich is this category in terms of meanings not by itself, but in relation with other categories. Among women the most repeated ones were "benefits for mental health" and "self-care", whereas in men "benefits for physical health" and "benefits for mental health" were mentioned the most.

The second most mentioned category among women was "sex and physical exercise" (36), which refers to the experiences related to physical exercise as a function of the sex of the person that practices it. This category is less repeated among men (22), who include in this category the motives for practicing physical exercise. Male participants perceive women to be less competitive than men and that they exercise for pleasure motives and not for competing. However, most men agree in the fact that they are inherently more competitive than women and their main reason for practicing physical exercise is to improve marks and to compete. Women referred to the category "sex and physical exercise" in relationship with the comments they receive as sportswomen: "That is what they told me, can't you quit? (referring to sports), now that you are with the kids? (referring to her children)" (MP2).

Most of these experiences interacted with the category "maternity-paternity", which had a great presence in the focus group of women (27), whereas it was not mentioned in the focus group of men. One of the participants expressed: "I want to be with my kids (...) then I go to run when they are asleep..." (MP7).



Regarding difficulties of emotion regulation, women scored higher in the total score and in the subscales of non-acceptance, interference and lack of control, although no significant differences were found in quantitative data (Table I). Qualitative results showed that “emotion regulation” category (the use of physical exercise as a way of emotion regulation) appears with a similar frequency in both sexes, but with a slight nuance that helps to understand quantitative data. Women identify “emotion regulation” as the main motive for which they practice physical exercise, as they associate physical exercise with a way of evading or escaping their daily life: “It is a way of escaping, uh, disconnecting from your life” (MPI).

For men, the main motive for which they practice physical exercise is related with competition and the implications that sport-related identity has for socializing and sharing time with peers with the same passion. In fact, they had greater scores in sports motivation (intrinsic motivation, extrinsic motivation, and amotivation) in quantitative data (Table I). “So, you are going to try to win races” (HP2); “Such fun, I enjoy a lot sports” (HP3). Nevertheless, men also referred to regulating emotions through physical exercise: “It is a shield, or it provides that equilibrium to the problems you may have with family or work” (HP2).

Another sex difference related with the experience of physical exercise in long-distance and endurance sports refers to physiological facets. Women mention “menstrual cycle” as a category directly related with “menstruation” and “menopause” as physiological phenomena that directly interfere with sport-related performance or progress. Men did not reflect the importance of physiology, mentioning only old age and the performance going down as a consequence of age.

The influence of social environment of a sportsperson in their daily actions related with sports (category “identification with physical exercise”) in both quantitative and qualitative data of the study was significantly greater for men (40) than for women (31). This is reflected among men participants this way: “I can’t conceive life without exercise, for health reasons, for my way of understanding life and for the capacity it gives you or the possibilities it creates for establishing links with other people” (HP5).

In both sexes exercising is reflected as a way of life, that is, as something that identifies them as their way of being in the world; they highlighted sports as a way of socializing and indicated the existence of a social group related to sports where the relationships are close and of confidence: “An important facet of sports for me is that it provides me my best relationships, my best friends, my best links with society” (HP6).

Finally, the influence of physical exercise on “family” (family unit: children, partner, parents, parents in law, siblings...) and in the couple (the person with whom a romantic relationship is shared) was analyzed. The interference of exercising on taking care of relatives was assessed. Male participants related “taking care of family” and “bilateral consequences of exercising” with their own competitive aims: “One ends up obsessed with running... at home... they enter into that circle, the aim is to make less than three hours. Then you come home... they are even more passionate about it than you” (HP4). However, women refer to the influence and role of the “partner” as pushing forward or obstructing exercise and “reconcile family” as a difficulty for practicing physical exercise. Moreover, the reaction of others and the partner while training with people of different sex was mentioned:



"I started running with the club and it was very cool, it was my thing, instead of blaming me for not going to run, I said, no, no, no... I won't be more tied" (MP5).

Regarding the second aim of our study, age correlated negative and significantly with all the variables of the study except for lack of emotional awareness and positive affect (Table 2). In the qualitative analysis, men mentioned old age and limitations that may arise while aging in relation with the rhythm and distance of races. However, when age was mentioned, women referred to the difference before and after having children.

DISCUSSION

The aims of this study were: a) to assess mean differences in ED, emotion regulation, affect, sports motivation, and identification with exercise as a function of sex, and b) to analyze the perceptions of individuals in relation with ED, emotion regulation, affect, sports motivation, and identification with exercise in relation to with life cycle.

First, it has been found that men scored higher than women in all the scales except for ED –withdrawal. Nowadays there is no agreement in different studies on sex differences in ED. Alcaraz- Ibáñez et al. (2022) affirm that men would have higher rates of ED than women, whereas other experts consider women to be more dependant than men (Pierce et al., 1997). Other authors such as Cabrita et al. (2018) and Magee et al. (2016) did not find sex differences. In this study, sex differences could be confirmed for withdrawal but not for the rest of scales. In both men and women, the more frequent symptoms of

ED were continuance and the reduction of other activities. The emotional pressure for practicing physical exercise and reducing or modifying other activities, such as work, leisure or family activities with the aim of exercising instead has been identified as an stressor that influences and may interfere with personal and social life, as well as in work-related activities. Lassner et al. (2022) had similar results in a study that included 72 women that were marathon runners. Additionally, Szabo et al. (2018) found that the most frequent symptoms of ED were lack of control and negative consequences in physical, psychological and social areas. Moreover, physical exercise practiced for alleviating or avoiding withdrawal symptoms may generate negative emotions and rumination, especially in women, and it could explain the relationship among ED and negative affect (Lassner et al., 2022).

Regarding affect, women had higher scores in negative affect than men. It has been proved that personal factors may lead to ED as an strategy to regulate negative mood. It has been affirmed that physical exercise can be used as a mean for regulating emotions and compensating emotion regulation difficulties (Bernstein & McNally, 2017). One of the significant differences that has been identified is that women perceive exercising as a time for themselves and as a way of evading, so physical exercise may be related to exercising as a way of emotion regulation in women. According to Lichtenstein et al. (2018), perceiving physical exercise as the only effective way of facing a negative mood or finding time for oneself can lead to a increase of negative mood in situations in which the person has limitations for exercising.

Table 2. Bivariate correlations among exercise dependency, difficulties in emotion regulation, positive and negative affect, identification with exercise, sports motivation and age

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1. Age	-																											
2. ED - Total	-.34**	-																										
3. ED - Tolerance	-.24**	.72**	-																									
4. ED Withdrawal	-.25**	.69**	.37**	-																								
5. ED Time	-.32**	.75**	.55**	.37**	-																							
6. ED Continuance	-.17**	.69**	.45**	.38**	.35**	-																						
7. ED - Intention effects	-.25**	.80**	.50**	.48**	.59**	.52**	-																					
8. ED Lack of control	-.20**	.80**	.53**	.51**	.54**	.48**	.62**	-																				
9. ED - Reducing other activities	-.35**	.75**	.39**	.47**	.50**	.49**	.62**	.60**	-																			
10. ER- Total	-.19**	.36**	.15**	.34**	.16**	.27**	.31**	.32**	.42**	-																		
11. ER - Lack of awareness	-.07	.14**	.05	.06	.00	.13**	.09	.19**	.22**	.54**	-																	
12. ER - Non-acceptance	-.16**	.34**	.14**	.37**	.14**	.26**	.29**	.27**	.35**	.88**	.28**	-																
13. ER - Lack of clarity	-.22**	.31**	.15**	.29**	.20**	.22**	.21**	.28**	.33**	.71**	.56**	.50**	-															
14. ER - Interference	-.17**	.24**	.09	.24**	.12**	.14**	.22**	.19**	.32**	.76**	.21**	.64**	.38**	-														
15. ER - Lack of control	-.14**	.34**	.14**	.31**	.15**	.25**	.31**	.28**	.39**	.91**	.31**	.79**	.52**	.69**	-													
16. Positive affect	-.02	-.07	.06	-.09	.06	-.12*	-.07	-.12*	-.16**	-.34**	.29**	-.27**	-.14**	-.27**	-.33**	-												
17. Negative affect	-.17**	.35**	.17**	.39**	.15**	.23**	.32**	.26**	.34**	.47**	.07	.46**	.23**	.43**	.50**	.25**	-											
18. Identification with exercise	-.18**	.30**	.31**	.09	.47**	.09	.17**	.21**	.19**	-.02	-.19**	-.01	-.00	.07	.00	.15**	.01	-.15**	.49**	-								
19. SM- Total	-.31**	.44**	.37**	.28**	.42**	.24**	.36**	.29**	.33**	.11*	.05	.11*	.14**	.12*	.09	.14**	.17**	.49**	-.54**	.90**	-							
20. IM1-total	-.32**	.31**	.30**	.14**	.39**	.12**	.22**	.18**	.20**	-.03	-.15**	-.01	.03	.03	-.03	.24**	.07	.54**	.90**	.65**	.90**	-						
21. EM-total	-.22**	.43**	.34**	.31**	.36**	.26**	.38**	.29**	.34**	.17**	.01	.16**	.15**	.16**	.15**	.03	.18**	.40**	.90**	.65**	.90**	.61**	-					
22. IM4-know	-.30**	.29**	.30**	.13*	.35**	.12*	.21**	.19**	.19**	-.06	-.14**	.04	.04	-.02	-.07	.25**	.05	.46**	.85**	.94**	.61**	.74**	.61**	-				
23. IM4-perception	-.30**	.26**	.25**	.12*	.38**	.07	.18**	.14**	.19**	-.00	-.15**	.02	.02	.08	.00	.18**	.08	.58**	.81**	.90**	.61**	.74**	.61**	.80**	-			
24. IM4-accomplishing things	-.31**	.29**	.30**	.13**	.35**	.13**	.22**	.17**	.19**	-.02	-.14**	.00	.03	.03	-.02	.25**	.06	.48**	.85**	.96**	.61**	.87**	.61**	.87**	.80**	-		
25. EM1-identified	-.26**	.33**	.24**	.23**	.32**	.21**	.27**	.21**	.22**	.04**	.09	.07	.02	.09	.04	.08	.08	.40**	.84**	.70**	.86**	.67**	.61**	.67**	.61**	.67**	-	
26. EM1-introjected	-.14**	.39**	.34**	.30**	.30**	.19**	.32**	.29**	.30**	.16**	.012*	.17**	.14**	.15**	.13**	-.01	.18**	.34**	.74**	.52**	.83**	.44**	.54**	.48**	.56**	.48**	-	
27. EM4-external	-.15**	.37**	.28**	.25**	.28**	.24**	.37**	.22**	.35**	.25**	.12**	.18**	.24**	.17**	.23**	.00	.19**	.26**	.67**	.40**	.81**	.39**	.35**	.36**	.56**	.52**	-	
28. SM4-motivation	-.15**	.37**	.18**	.34**	.16**	.31**	.39**	.32**	.34**	.34**	.19**	.33**	.34**	.17**	.28**	-.13*	.30**	-.13**	.35**	.05	.38**	.08	.03	.20**	.33**	.43**	-	

Note. **p < .01 *p < .05 . ED= Exercise dependency. ER = Emotion regulation SM = Sports motivation; IM= Intrinsic motivation; EM = Extrinsic motivation.



Relevant differences in motives for exercising have been found among men and women in this study. In women, escaping was the main motive for exercising. In men, however, competition and improving personal marks has been found to be an important motive. Men have a greater tendency to exercising for motives that are inherent to the activity (Rodrigues et al., 2022). This study agrees with these authors, since men referred to exercising as a very important activity in their daily routine and consider physical exercise important for developing skills, improving personal marks or competing. Therefore, men may exercise for an interest related with the sport itself, whereas exercising in woman is linked with emotion regulation. In this sense, Sicilia et al. (2018) mention that introjected extrinsic motivation is very important for understanding the development of ED. These results are novel regarding sex differences in motives for exercising.

Both male and female participants considered exercising as a lifestyle in which daily events are conditioned by the requirements of an exercising planification. Exercising is understood as more than a mere physical activity, it is considered to be a lifestyle, a set of values, attitudes and behaviors. In this sense, men have been found to have a higher identification with exercise than women. Identification with physical exercise has been linked with psychosocial isolation and a restrictive sense of personality (Pummell et al., 2008). These limitations may interfere with social, work and family life of sportspeople, damaging their social and psychological well-being (Berczik et al., 2012). According to Burke and Stets (2009) the perception of identity related with exercising may help to understand the meaning that physical exercise has

to sportspeople and the relationship among exercise dependency and identification with physical exercise (Allegre et al., 2007). Regarding sex differences, no differences had been found in identification with physical exercise (Modrono et al., 2010; Cabrita et al., 2018) so these results are novel about sex differences in identifying with exercise.

The relationship among "sex and physical exercise" was the second most mentioned among women. Women related this category with comments received as sportswomen. Caregiving roles are perceived as linked with female gender (Tobio, 2012). On the other hand, men only expressed the differences in motives for exercising that they observed. The conclusions of men agree with Alcaraz-Ibáñez et al. (2022) who defined physical exercise patterns that are characteristic for each sex; in the case of women, the use of physical exercise as a way of improving health and controlling mood, and in the case of men, as a way of spending a great amount of time in exercising, with a higher degree of volume/intensity than expected.

Moreover, previous studies affirm that age is determined for the development of physical exercise, since age correlates negatively with the risk for developing exercise dependency (Allegre et al., 2007). However, this study shows that it is life cycle rather than age what determines the risk for developing exercise dependency. Women especially highlight the difference before and after entering motherhood. Men usually don't experience relevant changes in how they exercise after entering fatherhood, but women tend to increase the presence of physical exercise in their lives after motherhood as a way of finding time for themselves. In this case, age has been a limiting factor for men due to the worsen-



ing of physical performance, while women mention menstrual cycle and most especially menopause as a limiting factor. No previous literature has been found that refers to the impact of parenthood in physical exercise.

Finally, some limitations must be highlighted. First, this is a cross-sectional study so causal relationships cannot be established, and the results cannot be generalized to other sports nor younger profiles. It would be interesting to replicate the study in longitudinal studies and thus assess exercise dependency in different moments of exercising career.

CONCLUSIONS

This study provides psychological and social risk factors for constructing an explicative model of exercise dependency. Emotion regulation, negative affect, identification with exercise and sports motivation are factors that have been related with exercise dependency as well as age and sex.

Sex differences have been found in the specific symptoms of exercise dependency in men and women. These differences can be helpful for identifying specific maladaptive beliefs and applying then in individualized therapeutic interventions. The differences that have been found among sportspeople of different sex can help to understand the reality of their daily life and its relationship with exercising.

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