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ORIGINAL ARTICLE

Risk of eating disorder in Colombian women who go to the gym

Riesgo de trastorno de la conducta alimentaria en mujeres colombianas que van al gimnasio

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ABSTRACT

Background: Mental health in gyms has not been a topic of study in Colombia. Social stereotypes of beauty and dissatisfaction with body image make women a population prone to excessive exercise. This research analyzes the risk of eating disorder in women who attend gyms (comparing ages), its relationship with the frequency of physical exercise and the use of diet to improve physical appearance. **Methods:** 519 women with ages between 15 and 50 years participated. The EAT-26 Eating Attitude Test was used, a standardized procedure to estimate the frequency of physical exercise and a brief socio-demographic survey. **Results:** the percentages of women with risk (46.8%) of TBI and without risk (53.2%) are similar, the factor scores and the total of the EAT-26 only show significant differences in the age range 15 -19 and 20-24, no significant correlations were found between the factors and the total score of the EAT-26 and the measure of frequency of physical exercise, and there is an association between the risk of eating disorders and diet to improve physical image. **Conclusion:** The percentage of women at risk for eating disorders is higher than those reported for high school students, university students, and athletes. A very high percentage of gym users would be compromising their mental health in some way, considering the frequency values of physical exercise.

Keywords: Eating disorder, gyms, physical exercise.

RESUMEN

Introducción: La salud mental en los gimnasios no ha sido un tema de estudio en Colombia. Los estereotipos sociales de belleza y la insatisfacción con la imagen corporal hacen que las mujeres sean una población proclive al ejercico excesivo. Esta investigación analiza el riesgo de trastorno de la conducta alimentaria en mujeres que asisten a gimnasios (comparando las edades), su relación con la frecuencia de ejercicio físico y el uso de dieta para mejorar la apariencia física. **Métodos:** participaron 519 mujeres con edades entre los 15 y los 50 años. Se utilizó el Test de Actitudes Alimentarias EAT-26, un procedimiento estandarizado para estimar la frecuencia de ejercicio físico y una breve encuesta sociomdemográfica. **Resultados:** los porcentajes de mujeres con riesgo (46,8%) de TCE y sin riesgo (53,2%) son similares, las puntuaciones de los factores y el total del EAT-26 solo presentan diferencias significativas en el rango de edad 15-19 y 20-24, no se encontraron correlaciones significativas entre los factores y la puntuación total del EAT-26 y la medida de frecuencia de ejercicio físico, y sí hay asociación entre el riesgo de TCA y la dieta para mejorar la imagen física. **Conclusión:** el porcentaje de mujeres con riesgo de TCA es superior a los reportados para estudiantes de secundaria, estudiantes universitarias y deportistas. Un muy alto porcentaje de las usuarias de gimnasio estarían comprometiendo de alguna forma su salud mental, considerando los valores de frecuencia de ejercicio físico.

Palabras clave: Conducta alimentaria, centros de acondicionamiento, ejercicio físico.

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BACKGROUND

Concern for, and even rejection of, plumpness and the ideal of a body adjusted to socially determined aesthetic parameters are increasingly frequent problems in a society in which cultural stereotypes of beauty promote thinness and slim-line silhouettes certain models of beauty (Brudzynski and Ebben, 2010; Musaiger and Al-Mannai, 2014). The desire to achieve an idealized figure has motivated, in some people, an intensified use of gyms as a means of improving their appearance and increasing satisfaction with their body image (Franco, Ayala & Ayala, 2011; Polivy & Herman, 2002).

Cultural stereotypes of beauty, dissatisfaction with body image and frequent physical exercise are a combination that has been shown to be associated with an increased risk of eating disorder (ED) (Granados & Del Castillo, 2009). Studies carried out with a population at risk of eating disorders have indicated that acceptance of body image is conditioned by the assessment of other people and the physical comparisons they make, therefore, the greater the sociocultural influence, the greater the perception of body fat, greater dissatisfaction with the image, lower assessment of physical self-concept and greater need to perform physical exercise (from Sá Resende Santos, Santos, Rodrigues, Falcão and Mendes, 2019).

Frequent exercise can lead to a decrease or alteration in diet and nutrition (diets or insufficient intake) with a consequent increase due to concern about weight and physical appearance. Women who attend gyms generally have a desire to improve their body image through frequent exercise and dieting or other modifications in their eating behaviors (Smink, van Hoeken & Hoek, 2012). This combination can increase the risk of eating disorders.

Women and athletes have a high vulnerability to eating pathologies (Currie, 2010; Niñerola and Capdevila, 2002). Exercising, under certain conditions, can be a trigger for an eating disorder (Fajardo, Méndez & Jauregui, 2017). It has been indicated that the sports environment can not only precipitate or aggravate an eating pathology, but also legitimize it, since these environments favor competition, overtraining and food restriction, since the ideals of body image often imply the loss of weight or body fat as a method of looking slim.

Most of the studies on ED in Colombia have been carried out regularly with high school students (Barrera, Manrique and Ospina, 2013; Fandiño, Giraldo, Martínez, Claudia and Espinosa, 2007; Moreno et al., 2016; Rodríguez and Mina, 2005; Rueda et al., 2005). In university students, a prevalence of 44.1% was reported in women and female gender and the desire to reduce weight were found as associated factors (Constaín et al., 2014). Mental health, and its physical implications, in gyms has not, until now, been a topic of interest in Colombia or, as reflected by the limited literature, in Latin America. Exercise is health, but certain excesses or associated conditions can change a healthy practice into an activity that is detrimental to physical and mental health.

In the results of the study by Sánchez, Miranda and Guerra (2008) it was reported that 48% of the women evaluated go to the gym to be in shape. Likewise, the investigation by Dosil and Díaz (2012) found that there is a high risk of suffering from eating disorders in women who exercise in gyms (9.20% obtained a score higher than 30 on the EAT, which is indicating symptoms of a severe ED). In addition, Lentillón-Kaestner (2015) found that 10.31% of women who attend cardio-fitness classes reached a critical threshold, indicating an Eating Disorder (EAT-26 score ≥ 20) and reported that the greater the sports commitment of the users, the greater the risk of suffering from eating disorders. In the study by Castrejón (2018), carried out with gym users, it was found that 14.5% present risky eating attitudes, the risk being higher in women (16.1%) compared to men (13.0%). This result agrees with the findings of San Mauro et al. (2014), who found that more than 50% of the sample studied had concerns about their physical appearance, the highest percentage being in women (66% in women vs 45% in men), in addition those evaluated mentioned that the acceptance of their image was conditioned by the assessment of other people and the physical comparisons they made, therefore, the greater the sociocultural influence, the greater the perception of body fat, the greater the dissatisfaction with the image and the lower the assessment of physical self-concept.

Regarding abnormal eating patterns and compensatory behaviors used by women suffering from ED, Castrejón (2018) found that 100% of gym users presented restrictive eating behaviors, 58% binge-eared and 92% stated having performed compensatory behaviors, such as: taking laxatives, diuretics or pills to lose weight, in addition to prolonged fasting (41.6%). In those evaluated, purging had two main functions: to compensate for binges and to reduce calorie intake, regardless of the amount of food eaten.

Castro-López, Cachón, Valdivia-Moral and Zagalaz, (2015) reported that there were significant differences in the hours spent in the gym between the subjects who presented greater concern for the image, compared to those who did not, since the group of Subjects who reported spending more than 21 hours a week in the gym had a higher risk of eating disorders, a result that is compatible with the findings of López-Barajas, Castro-Lopez and Zagalaz-Sanchez, (2012), who stated that eating disorders are related to concern about the increase in hours that must be devoted to exercise routines in the gym.

It is possible to identify some indicators related to the risk of suffering from ED in those who practice physical activity, of which the deficit in self-concept and self-image stands out, since when a distortion occurs in these self-schemas, there is a greater probability that dependence will develop physical exercise as a strategy to lose weight and look slim (Cifuentes, 2016). This is consistent with the results of Chacón and Moncada (2013), who found in their study that participants with the highest body fat percentage also had higher body dissatisfaction scores. Baile, González, Ramírez and Suárez, (2011) observed that gym users who have alterations in their body image also have more altered eating and exercise habits,

Souza, Souza, Barroso and Scorsolini-Comin, (2013) highlighted that one of the main reasons why people start physical activity programs is dissatisfaction with the body, hence in the results of their research they found that more than half of the women who were evaluated (54%) and who had a normal body mass

index reported that they wanted to weigh less or that they felt dissatisfied with their weight, which is why they had a constant fear of gaining weight and exhibited abnormal eating behaviors. Knowing the mental health conditions of people who carry out physical activity will allow the elaboration and implementation of promotion and prevention programs and strategies aimed at generating behavioral changes that affect the risk of eating disorders. The general objective of this study was to analyze this risk in a sample of female gym users in the city of Medellín, Colombia. According to the literature review, this is the first study in the country and one of the few in Latin America to address this problem with this particular population. The research questions that guided the study were:

1. What is the prevalence of ED risk in a group of women who go to the gym?
2. Are there statistically significant differences in the factor scores and the total risk score for eating disorders as a function of age?
3. Are there any correlations between ED risk and gym frequency self-reports?
4. Is there an association between the risk of eating disorders and diet to improve physical appearance?

METHOD

Design

A cross-sectional ex post facto investigation was carried out with a quantitative, descriptive-correlational approach using non-probabilistic convenience sampling.

Technique for gathering information

The technique used was the unstructured interview, which seeks the information that is needed through defined topics or focuses. Díaz, Torruco, Martinez and Varela (2013) state that this type of interview is informal and flexible, whereby it adapts to contextual conditions. However, this does not prevent us from delving into the subject and detailing relevant aspects for the research. Through the question and answer, the life reconstruction of the interviewed person is achieved and in his story the meaning that the person has about an experience or topic addressed is reflected, in this case the experience of suffering from Type 2 Diabetes Mellitus.

Participants

The study involved 519 women aged between 15 and 50 years (Me = 23.64; IQR = 20-26). 62.6% of the women had university education, 17.0% had technical or technological education, 16.4% were high school graduates and 4.0% had postgraduate training. 66.5% were in the middle socioeconomic stratum (3 and 4), 18.3% in low (1 and 2) and 15.1% in high (5 and 6). The participants were contacted in 12 gyms in the city of Medellín, Colombia. They performed different training modalities, such as: CrossFit, functional training, weightlifting and traditional use of machines. The only inclusion criterion was that they had been attending the gym for at least three months. The instruments were completed by self-report.

Instruments

The instruments and techniques for collecting information were: 1) a sociodemographic questionnaire that included questions about age, education, socioeconomic status, time devoted to exercise (total time in months attending, days per week and routine hours per day) and the consumption of diets to improve body image. 2) The Eating Attitudes Test (EAT-26): has a validation in the female population of the city of Medellín (David, et al., 1993) with an appropriate factorial structure (determinant of the correlation matrix = 0.000000291, Bartlett's sphericity test = 2.466.48 with a $p < 0.0001$, and Kaiser-Meyer-Olkin measure of sampling adequacy = 0.90), excellent reliability values (Cronbach's alpha was 0, 92) and sensitivity (100.0%; 95% CI: 86.3-100.0%), and an adequate specificity value (85.6%; 95% CI: 77.6-91.5%), appropriate for screening for possible eating disorders in a population at risk. The risk of eating disorders is satisfied with a score ≥ 20. It is made up of four factors: diet, bulimia, preoccupation with food, and oral control. And 3) a measure of the frequency of physical exercise: the procedure suggested by Davis, Brewer and Ratusny (Campo and Villamil, 2012), which has been used in multiple investigations on the subject, was adopted. The participant was asked to indicate the following: the number of weeks of gym attendance during the last 12 months, the average number of sessions per week, and the average duration (in minutes) of each session (1-30, 30- 60, 60-90, 90-120, 120+).

Analysis plan

The parametric data (according to the Kolmogorv-Smirnov test in which all variables obtained a $p > 0.05$) were systematized and analyzed using the IBM SPSS v. 24 using descriptive statistics, one-way ANOVA (Tukey's HSD post hoc test), bivariate correlation analysis (Pearson's correlation coefficient), and chi-square independence test. The results were considered significant for p values <0.05.

Ethical aspects

The research was carried out in compliance with the provisions of Law 1090 of 2006 of the Colombian College of Psychologists, as well as Resolution 8430 of 1993 of the Ministry of Health of Colombia. The project was reviewed and approved by the Bioethics Committee of one of the universities that executed it. The objective of the project was explained to them and all participants signed the informed consent.

RESULTS

The women had been attending the gym for between 3 and 252 months (Me = 24; IQR = 12-48). Attendance occurred at least one day a week and maximum every day of the week (Me = 5; IQR = 4-5). The daily routine hours varied between 1 and 5 (Me = 2; IQR = 1-2). 46.8% of the participants were on a diet to improve physical appearance.

As can be seen in Table 1, the percentages with risk and without risk are similar, although the percentage of participants without risk is higher. In the percentages discriminated by age ranges, the results are similar, with the exception of the ranges of wom-

en with ages between 30 and 34 years, and the age range equal to or greater than 35 years. Here the percentages at risk are higher than the percentages without risk.

Table 2 contains the values of the medians and interquartile ranges of the factors and the total score discriminated by age ranges. The one-way ANOVA analyzes for all factors and the total score comparing the ranges only reported statistically significant differences in the Oral Control factor. Tukey's HSD post hoc test indicated that statistically significant differences are between the 15-19 and 20-24 ranges.

No statistically significant correlations were found between the factors and the total score of the EAT-26 and the measure of frequency of physical exercise (see Table 3). The chi-square test to analyze the association between the risk of eating disorders (With risk / Without risk) and the realization of a diet to improve the physical image reported a positive result ($\chi^2 = 6.44$; df = 1; p = 0.011). In such a way that there is an association between the risk of eating disorders and this type of diet.

DISCUSSION

The findings of this study were: first, the percentages of women at risk of ED and without risk are similar, although the percentage without risk is higher. Second, the factor scores and the total of the EAT-26 only present significant differences in the age range 15-19 and 20-24. Third, no significant correlations were found between the factors and the total score of the EAT-26 and the measure of frequency of physical exercise. And fourth, there is an association between ED risk and diet to improve physical image.

In Colombia there are few studies on eating disorders in female gym users and this prevents comparisons. The studies that have been carried out have used the general population, regularly students. In female secondary school students, prevalences have been reported with a range between 3.5% and 41.3% (Barrera, Manrique and Ospina, 2013; Fandiño et al., 2007; Moreno et al., 2016; Rodríguez and Mina, 2005; Rueda et al., 2005). In university students, the range is from 20.4% to 44.1% (Campo and Villamil, 2012; Fandiño et al., 2007), higher than that of high school students, but lower than that of gym users, whose percentage is of the 47.5% (Sánchez, Miranda and Guerra, 2008).

The findings on risk factors associated with the risk of eating disorders suggest that there should be a greater probability of risk in those who attend gyms. It has been found, for example, that female gym users who perform sports for aesthetic purposes frequently alter their eating habits in order to lose fat, weight and flaccidity (Costa, Fernandes, Matsudo & Cordás, 2008). Almost half of the women in the present study were dieting to improve physical appearance, which could eventually be associated with an increased likelihood of ED risk.

Pursuing aesthetic purposes, that is, seeking to improve phys-

Table 1. Risk of eating disorder.

		With risk	Risk free
	n	*F* (%)	*F*(%)
Total	519	243 (46.8%)	276 (53.2%)
Age range			
15-19	97	43 (43.9%)	54 (56.1%)
20-24	231	112 (48.3%)	119 (51.7%)
25-29	134	56 (41.2%)	78 (58.8%)
30-34	37	22 (59.5%)	15 (40.5%)
≥35	16	10 (62.5%)	6 (37.5%)

Table 2. Factors and total score of the EAT-26 by age ranges

	Total	Age range					
	M (DE)	M (DE)					
		15-19	20-24	25-29	30-34	≥35	ANOVA
Bulimia	1.83 (2.4)	1.56 (2.0)	1.92 (2.5)	2.08 (2.5)	1.29 (1.4)	1.50 (1.3)	0.27
Diet	3.30 (4.0)	2.65 (3.7)	3.23 (4.0)	3.70 (4.4)	3.21 (3.3)	5.18 (4.3)	0.116
Concern	5.62 (3.9)	4.82 (3.5)	5.91 (4.0)	5.31 (3.6)	6.70 (4.6)	6.31 (4.6)	0.055
Oral control	2.16 (2.6)	2.97 (2.9)	2.01 (2.4)	1.95 (2.6)	1.83 (3.0)	1.93 (3.4)	0.024 *
Total EAT	12.92 (9.9)	12.03 (8.4)	13.05 (10.2)	13.13 (10.9)	13.05 (8.7)	14.43 (10.3)	0.87

* p <0.05

ical appearance (body image) is one of the reasons why some people attend gyms (Baile, González, Ramírez & Suárez, 2011). This desire has been associated with a negative self-image. Lentillon-Kaestner (2012) observed that gym users who have alterations in their body image also have more altered eating and exercise habits, which supports the hypothesis that the acceptance or not of body image has a significant impact on the altered eating behaviors and inappropriate use of the gym.

Previously, in the same city, but with a smaller sample and from different fitness centers, Restrepo and Castañeda (2018) had analyzed the relationship between the risk of eating disorders and the use of social networks in women. Using the EAT-26 and a questionnaire on the use of social networks, they reported a risk percentage of 47.5% and a statistically significant association with some aspects of the use of networks: the group at risk took more photos to show their progress in the gym, more frequently compared their photos with those of other people they consider to be a "better figure" and when they upload a photo to Instagram they expect to have more *likes* and positive comments about how they look.

The present study found a similar percentage and detected a statistically significant association between ED risk and diet to improve physical appearance. This finding is in line with other studies that suggest that there is an interaction between dissatisfaction with body image, excessive exercise and the risk of eating disorders (Laus, Braga & Almeida, 2013). It is likely that the use of gyms is more oriented towards the search for an aesthetic ideal or the desire to improve body image due to media and sociocultural pressures (Musaiger and Al-Mannai, 2014). The excessive practice of physical exercise in this group of Colombian women may be more motivated by the desire to modify their physical appearance and this motivation, as other research has shown (González-Cutre and Sicilia, 2012) is a risk factor for the development of an eating disorder or an addiction to physical exercise.

Although there are reasons and empirical findings that support the idea of a high prevalence of ED risk in gym users compared to the general non-clinical population, the results of the studies remain heterogeneous. In female gym users, prevalences of 10.31% (Ward, Rodriguez, Wright, Austin and Long, 2019), 16.1% (Castrejón, 2018) and 50% (Baile, González, Ramírez and Suárez, 2011). The results of the present investigation are closer to this last study, which was carried out in Brazil. Without a doubt, the prevalence is higher in gym users compared to the general population.

In women older than 30 years there is a higher percentage of risk of eating disorders, but this descriptive information was not supported by statistical analyzes to detect significant differences, nor does it coincide with epidemiological reports (Currie, 2010), although these have been carried out with the general population. Statistically, the age ranges only differed in the Oral Control factor (ranges 15-19 and 20-24). In the total score of the instrument, which defines the risk of eating disorders, there were no differences between the ages. The percentage of prevalence of ED in women has been reported to increase from 10.3% at 21 years to 19.4% at 40 years (Shroff, Thornton, Tozzi, Klump & Berrettini, 2006).

The Oral Control factor depends on the items: "I cut my food into small pieces", "I notice that others would prefer that I eat more", "Others think that I am too thin", "I take longer to eat than other people "And" I notice that others are pressuring me to eat "and is associated with a concern to reduce the amount of food eaten. This concern, which may be related to the diet that almost half of the women were doing to improve their physical appearance, is associated with dissatisfaction with body image and is associated with the pathogenesis of eating disorders (Granados and Del Castillo, 2009, Restrepo and Castañeda, 2018). This finding coincides with the one reported by Castrejón (2018) in relation to abnormal eating patterns and compensatory behaviors used by women suffering from ED,

So oral control seems to be a differential aspect of the eating behavior of women between 15 and 24 years of age. According to the epidemiological study by Ward et al., (Shroff et al., 2006), which analyzed the dynamics of ED as a function of age, adolescence and young adulthood are critical periods for the initial development of an ED, with almost all cases (95%) occurring for the first time by the age of 25 years. Thus, they suggest concentrating prevention efforts at these ages. However, they highlight that, given the risk of relapse and continued prevalence at later ages, diagnosis and treatment at older ages should also be a priority.

This recommendation is interesting since, when comparing the risk of ED (with / without) according to age, the group of women over 30 years of age had the highest percentages in the group at risk. Undoubtedly, it is an unexpected finding since it does not coincide with the reports in the literature in which,

Table 3. Correlations between the factors and total score of the EAT-26 and the frequency of physical exercise

	Exercise frequency	
	Correlation	***p***
Bulimia	-0.003	0.964
Diet	-0.029	0.669
Concern	-0.041	0.544
Oral control	-0.063	0.351
Total	-0.044	0.522

as stated, a higher prevalence has been detected between adolescence and young adulthood. However, these reports have been made predominantly with a population other than gym users. Complementary studies should be carried out to find out the reasons that motivate the use of the gym in this age group in order to advance in the understanding of these differences.

Excessive exercise is a common feature of eating disorders. Between 21% and 55% of people with eating disorders exercise excessively, and this is associated with an earlier onset, more symptoms, and a greater persistence of these disorders (Bratland, Martinsen, Rosenvinge, Ro and Sundgot, 2011). Other studies (Cook, Hausenblas, Crosby, Cao & Wonderlich, 2015) have also reported that ED symptoms are positively associated with a weekly amount of vigorous, non-moderate physical activity; that is, with an excess of physical activity, but they have concluded that it is more important to analyze the intensity of the exercise and not its frequency. In the present study, no correlation was found between the risk of eating disorders and the frequency of exercise. Cook et al. (Ghoch, Soave, Calugi and Dalle,

A descriptive study conducted in the United States between 2011 and 2015 in which more than a million people participated analyzed the association between physical exercise and mental health and concluded that more exercise is not always better: extreme ranges of more than 23 times a month, or more than 90 minutes per session, were associated with worse mental health (Ghoch, Soave, Calugi, & Dalle, 2013). According to the authors, exercising beyond 6 hours per week is associated with poorer mental health.

With these figures as a reference, the women who participated in the present study would be above, with a frequency of weekly hours of 10 hours (calculated from the median hours per day and the median days per week). Thus, although only half are at risk of eating disorders, a very high percentage of gym users would be compromising their mental health in some way. In this way, gym trainers should be a target for education on eating disorder risk factors, as they are potential 'agents' for early detection of eating disorders (Ghoch, Soave, Calugi and Dalle, 2013).

One of the main limitations of this study was the failure to form age groups with the same number of participants. Although it was tried, there are definitely some age ranges in which there are more women who go to the gym (20 to 30 years). Differences in the frequencies of participants by rank may have affected the results. Despite this, this is, most likely, the first study on the risk of eating disorder in Colombian women who attend gyms. It is also one of the few Latin American studies on mental health in people who are active in fitness centers. Despite this, it coincides to a very high degree with a study carried out in Colombia with university students in which a prevalence of 44.1% was reported in women and the female gender and the desire to reduce weight were found as factors associated with the risk of ED (Constaín et al., 2014).

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CONFLICTS OF INTEREST

None of the authors declares a conflict of interest.

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