VIGOREXY AND LEVELS OF EXERCISE DEPENDENCE IN GYM GOERS AND BODYBUILDERS

ORIGINAL ARTICLE

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ABSTRACT

Introduction: Currently, good appearance is a synonym to success, health and determination. So as to, the modern society overwhelms the individuals to follow beauty stereotypes. The heritage of this capitalist and selfish society is the psychological appearance disorders and the psychological dependence associated with them. Among these, we can mention vigorexy and exercise dependence. Objectives: I) to compare vigorexy levels and exercise dependence among gym goers and bodybuilders, II) to correlate the variables on physical practice (time of practice, weekly frequency and sessions time) to the frequency dimensions of vigorexy and exercise dependence; and, III) to compare vigorexy levels according to the exercise dependence groups (dependent or in risk, not symptomatic dependent and not asymptomatic dependent). Methods: The sample was composed of 151 male gym goers (27.66 ± 6.54- year-old and 27.56 ± 5.03 BMI) and 25 bodybuilders (30.80 ± 5.54-year-old and 26.72 ± 4.24 BMI). The participants answered the Exercise Dependence Scale and the Muscle Dysmorphia Disorder Inventory. The statistical analysis involved descriptive, univariated normality, comparative and correlational analyses. Results: The main results were: I) absence of differences between gym goers and bodybuilders concerning vigorexy levels and exercise dependence, II) training session time is positively correlated with most of the dimensions of the exercise dependence, and, III) the group classified as dependent or in risk reveals medium superior levels of vigorexy. Conclusion: Lastly, it was found that both in bodybuilders and gym goers, the higher the vigorexy level, the higher the exercise dependence with this correlation in bodybuilders.

Keywords: body dysmorphia disorders, body image, resistance training.

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INTRODUCTION

Beauty has been extremely important since Greek mythology. Beauty was challenged by Olympus Goddesses and the One that was seen as the most beautiful was envied by all the others[1]. Nowadays our society worships beauty reinforced by media, *Photoshop® and* falsehood and that leads people to follow standardized exquisiteness. Apparently, this behavior has triggered several psychological disorders related to appearance[2]. Among the most common disorders, we focus on vigorexy and dependence on physical practicing. Vigorexy is a kind of body dysmorphic disorder[3,4] in which the individual empowers either the aesthetic defects s/he may have or the ones s/he thinks s/he has. Such imperfection may turn individuals into feeling they are hideous. Its comorbidity is extensive and individuals undergo immense psychic suffering[5,6] due to the fact that the imperfection may not be seen in a small portion of the body but in the whole. That is, people may perceive themselves as small, weak and lacking vigor. Men are likely to have this disorder and are obsessed to have maximum hypertrophy and minimum body fat. Process analysis of body image is delirious and dissatisfaction on results is permanent. The individual practices exercises only focusing on physical appearance[7,8]. Concerning exercise dependence, this disorder is classified as non-drug dependent in which individuals practice compulsively for the sake of the pleasure the practicing provides. Based on some studies (e.g. Hausenblas and Downs[9]), non-drug dependency have a higher number of casualties comparing to cocaine. Among diagnostic characteristics, withdrawal and loss of intensity control, frequency and time of exercising are found[9-13].

Reviewing scientific studies on that subject, we have found that marathonists and runners have been studied but individuals who practice strength training haven not[13-15]. On the other hand, vigorexy has often been studied on subjects who take anabolic steroids but has not been analyzed in specific groups concerning their psychological characteristics and comorbidity[16-18].

Frequency of weekly sessions and length of time of physical activities have also been disregarded. Criteria establishing compulsive exercising or addiction to exercising have been associated to eating disorders as studied by Grave *et al.*[26]. This study found that excessive exercising could be considered in individuals who practice exercises 3 hours on 5 weekly sessions reaching the total of 15 week house. These criteria has also been studies on marathonists who were considered addicted and practiced running five days a weeks and also reached 15 weekly hours[19]. Kjelsas *et al.*[19] has defined low physical activity for women who practiced exercises from 5 to 10 weekly hours and high physical activity for those who practiced longer than 10 weekly hours.

However, no studies associating the effects among different kinds of physical activity with strength training and its influence on exercise dependency or vigorexy. Studies associating number of sessions and weekly time spent on physical activity and vigorexy have not been found either.

Based on the previous data, our study has the objective of analyzing this theoretical scenario and provide insight into this scientific field by comparing levels of vigorexy and exercise dependency among gym goers and bodybuilders, relating the variables of physical exercising practice (time of practicing, weekly frequency and session length of time) to frequency dimensions of vigorexy and exercise dependence, and comparing levels of vigorexy among groups of exercise dependence (dependent or at risk, non-dependent symptomatic and non-dependent asymptomatic).

METHODS

Sample

This study has collected a group of 151 male individuals randomly chosen who have been to gym. 25 out of 151 were chosen for being bodybuilders. Table 1 presents an extended profile of this sample. They aged from 20 to 45 and they went to the gym three times a week for six consecutive months at least. They should have also practiced strength training among other exercises at the gym. For bodybuilders, they should have practiced or been training to compete in national championships. All individuals who presented any disease in the musculoskeletal system or declared any mental disorders previously diagnosed and not treated did not participate in this study.

Instruments

The Exercise Dependence Scale consists of an instrument to measure exercise dependence designed by Hausenblas and Downs[10]. Such instrument measures the exercise dependence through a questionnaire of 21 questions in which item is scored from one to six, representing never and always respectively following behaviors and beliefs in the last 3 months. The total of these items enables the calculus of seven differentiate scores, each one representing a symptom of exercise dependence: withdrawal, continuity, tolerance, loss of control, decrease of other activities, time and intentional effect. Besides that, it also enables the calculus of a representative global score for exercise dependence. The higher the score, the higher the level of exercise dependence and the higher the score for a specific symptom, the higher that aspect of increasing the exercise dependence in an individual. Additionally, this present scale provides differences in samples of these three groups[10]: i) those who are dependent or at risk of exercise dependence; ii) those are not dependent but present symptoms associated to exercise dependence; and iii) and those who are not dependent and do not present any symptoms of dependence.

The Muscle Dysmorphic Disorder Inventory consists of an instrument which measures muscle dysmorphia devised by Hildebrandt *et al.*[20]. It consists of 21 items in a scale divided from 1 to 5 points, representing always and never respectively according behaviors and beliefs in the last three months. The total of items enables the setting of 3 differentiated scores each one representing a vigorexy symptom: size, intolerance to appearance and functional defects. The higher the score, the higher tendency for vigorexy and the higher the score in a specific symptom, the higher the chance of increasing vigorexy in that individual.

Procedures

The present study followed rules for research on human beings, resolution 196/96 by National Health Council. We also submitted the research project to Research Ethics Committee from the Federal University of Mato Grosso do Sul in charge of studies on human beings. After being selected and qualified, this study was approved referred and supported by proceedings protocol no. 1563. Initially, we required a list of all gyms located in Campo Grande, MS, Brazil to Regional Board of Physicla Education (CREF-MS) in order to choose the gyms that would follow our criteria. 133 out of 261 associated gyms were either ballet schools or swimming schools or not located in residential areas. Therefore, 30 gyms were taken out of 128 and five gymgoers of each were chosen to participate in our research.

All participants agreed to sign a consent term for this study on which objective, evaluation procedures, volunteering and liabilities by the researchers were presented. After signing the consent term, the participants had their height and weight measured and medical history written down.

Body Mass Index (BMI) was evaluated following Quetelet index: BMI (kg/m2) = mass (kg) / height^2 (m). The measuring of weight and height was taken by using a mechanical anthropometric scale Welmy®, model R-110 and the subjects were shoeless and wore trunks only. After that, individuals answered in the questionnaires.

Statistical Analysis

Initially there were descriptive analysis (frequency, average, skewness and kurtosis) and internal consistency (Cronbach's alpha). After that, ANOVA and MANOVA analysis were done to determine the effect on groups (gymgoers or bodybuilders) of variables studied. The χ^2 was applied to compare the distributed samples among groups. Pearson's r coefficient was used to measure the linear relation among questionnaire dimensions. All analyses were performed using SPSS16.0 at significance level $p < 0.05$.

RESULTS

Table 1 presents results on characteristics of samples relating to anthropometric measures and practice of physical exercises (time of practice, weekly frequency and session time). Results show that samples do not differ relating to anthropomorphic variables even though bodybuilders report an older average age than gymgoers ($p < 0.05$). Comparing characteristics of physical exercise, bodybuilders reported a longer time of practice and higher weekly frequency ($p < 0.01$) though session time is longer to gymgoers ($p < 0.05$). Table 2 presents the descriptive parameters and normality analysis of each scale and respective coefficient of internal consistency as well.

Table 1. Characteristics of gymgoers and bodybuilders.

	Gymgoers (n = 151) M ± DP	Bodybuilders (n = 25) M ± DP	F	P
Age (years)	27.66 ± 6.54	30.80 ± 5.45	5.18	0.024
Body Mass (kg)	82.87 ± 13.11	81.80 ± 17.24	0.13	0.717
Height (m)	1.77 ±.07	1.74 ±.07	2.90	0.090
BMI (kg/m2)	26.72 ± 4.24	27.76 ± 5.03	1.23	0.269
Time of Practice (TP) (years)	6.25 ± 5.62	11.12 ± 6.87	15.10	0.000
Weekly Frequency (WF) (days)	4.53 ± 1.20	5.40 ± 1.19	11.32	0.001
Session Time (ST) (minutes)	92.62 ± 48.12	72.40 ± 26.54	4.19	0.042

Table 2. Descriptive analysis, normality and internal consistency of dimensions. Exercise Dependence Scale and Muscle Dysmorphia Inventory.

	Min.- Max.	M	DP	Skewness	Kurtosis	alpha
Dependence						
Withdrawal	3 - 18	8.48	4.33	0.56	–0.61	0.84
Continuity	3 - 18	6.31	3.77	1.43	1.76	0.78
Tolerance	3 - 18	10.78	4.11	0.14	–0.88	0.74
Loss of control	3 - 18	7.73	3.78	0.96	0.70	0.77
Decrease of other activities	3 - 18	5.18	2.84	1.61	1.73	0.72
Time	3 - 18	6.29	3.36	1.41	1.98	0.79
Intentional effects	3 - 18	5.99	3.65	1.54	2.19	0.79
Total score	25 - 112	50.95	17.82	1.38	1.74	0.89
Vigorexy						
Size	7 - 34	19.05	6.25	0.34	–0.53	0.81
Intolerance to appearance	7 - 28	12.70	4.26	0.88	0.44	0.73
Functional defects	7 - 28	13.69	4.56	0.65	–0.01	0.70
Total score	21 - 112	45.56	12.48	1.13	1.85	0.82

Concerning the descriptive analysis of scales, we have found that average values of exercise dependence questionnaire varied from 5.18 ± 2.84 to the decrease of other activities and 10.78 ± 4.11 to tolerance. Concerning vigorexy, the average values varied from 12.70 ± 4.26 to intolerance to appearance to 19.05 ± 6.25 to size. Standard values of univariated normality set in an interval associated to an approximately normal distribution. Results of internal consistency showed expected indexes of reliability (α > 0.70) to varied dimensions of questionnaires applied.

Taking the sample (gymgoers or bodybuilders), MANOVA has not found any significant effect on dimensions of exercise dependence (F (7.168) = 1.51, $p > 0.05$, Wilk's Lambda =.941, η^2 =.06), and vigorexy (F (3.172) =.82, $p > 0.05$, Wilk's Lambda =.986, η^2 = 0.02) as shown on the ANOVA results on table 3. ANOVA comparative analysis reinforces the absence of significant differences ($p > 0.05$) among groups relating to global dimensions and scores on exercise dependence and vigorexy.

Table 4 shows the correlation among variables of practicing physical exercise (time of practice, weekly frequency and session time) and the scales of exercise dependence and vigorexy. Correlational analysis shows that time of practicing physical exercise is not associated to intentional effects and appearance. Weekly frequency is associated to tolerance, though. Besides, time of session varied with higher correlated effect when associated to most of dimensions of exercise dependence (withdrawal, continuity, loss of control, time intentional effects and total score).

Table 3. Comparative analysis of dimensions relating to exercise dependence and vigorexy by modality.

	Gymgoers (n = 151) M ± DP	Bodybuilders (n = 25) M ± DP	F	P
Dependence				
Withdrawal	8.65 ± 4.31	7.48 ± 4.99	1.57	0.212
Continuity	6.32 ± 3.73	6.24 ± 4.06	0.01	0.918
Tolerance	10.69 ± 3.94	11.32 ± 5.11	0.50	0.479
Loss of control	7.73 ± 3.73	7.76 ± 4.16	0.00	0.969
Decrease of other activities	5.07 ± 2.66	5.88 ± 3.77	1.77	0.186
Time	6.26 ± 3.31	6.48 ± 3.72	0.09	0.761
Intentional effects	6.15 ± 3.69	5.08 ± 3.35	1.83	0.177
Total score	51.07 ± 17.84	50.24 ± 18.03	0.05	0.829
Vigorexy				
Size	19.10 ± 6.10	18.76 ± 7.22	0.06	0.802
Intolerance to appearance	12.74 ± 4.43	12.44 ± 3.12	0.11	0.744
Functional defects	13.52 ± 4.53	14.72 ± 4.70	1.48	0.225
Total score	45.50 ± 12.53	45.92 ± 12.43	0.03	0.876

Finally, we have categorized individuals according to their levels of dependence. Such data enabled us to identify 9 individuals at risk (5.1%), 104 (59.1%) non-dependent symptomatic men and 63 (35.8%) non-dependent asymptomatic individuals. No significant differences on distribution of the samples ($X^2(2) = 1.63$, $p > 0.05$). Considering groups of risk levels of dependence, MANOVA has shown a significant variable to differentiate dimensions of vigorexy (F (6.342) = 4.98, $p < 0.001$, Wilk's Lambda =.846, $\eta^2 = 0.08$) and such univariated results are presented on Table 5. Relating to ANOVA analysis, significant differences are kept among groups for all scales as well as for the global score which shows the tendency to increase levels of vigorexy and increasing the risk of exercise dependence.

Table 4. Correlational analysis of TP, WF and ST with dimensions. Exercise Dependence Scale and Muscle Dysmorphia Inventory.

	Time of practice (years)	Weekly Frequency (days)	Session Time (minutes)
Dependence			
Withdrawal	0.03	–0.01	0.19**
Continuity	0.11	0.10	0.15*
Tolerance	0.03	0.15*	0.06
Loss of control	–0.02	0.13	0.17*
Decrease of other activities	–0.07	0.08	0.07
Time	–0.13	0.03	0.19**
Intentional effects	–0.21**	–0.01	0.25**
Total score	–0.05	0.09	0.23**
Vigorexy			
Size	–0.04	0.05	–0.07
Intolerance to appearance	–0.17*	0.03	0.07
Functional defects	0.06	0.13	–0.11
Total score	–0.07	0.06	–0.06

*$p < 0,05$, **$p < 0,01$

DISCUSSION

This study has the objective of understanding the dynamics of dimensions related to exercise dependence and vigorexy on gymgoers and bodybuilders. Also, we found the necessity to analyze some specific populations from fitness context which have not been studied yet.

Comparing levels of vigorexy and exercise dependence among gymgoers and bodybuilders, we have observed that even though gymgoers reached higher total scores exercise dependence and bodybuilders reached higher total scores on vigorexy, there has been no significant difference between the two groups on the analyzed dimensions.

Table 5. Comparative analysis following dimensions of vigorexy and its risk levels for exercise dependence.

	Dependent/ At risk (n = 9) M ± DP	Non-dependent symptomatic (n = 104) M ± DP	Non-dependent asymptomatic (n = 63) M ± DP	F	P
Vigorexy					
Size	22.00 ± 4.77	20.13 ± 6.39	16.86 ± 5.60	6.85	0.001
Intolerance to appearance	15.11 ± 4.62	13.48 ± 4.44	11.06 ± 3.35	8.51	0.000
Functional Defects	16.89 ± 5.44	14.55 ± 4.44	11.83 ± 3.99	10.33	0.000
Total score	54.00 ± 7.89	48.50 ± 12.71	39.49 ± 10.05	14.27	0.000

According to Choi *et al.*[21], gymgoers have shown increasing dissatisfaction to appearance and that turns them more symptomatic at the total score on exercise dependence. According to Wolke and Sapouna[22], bodybuilders present a disorganized body perception which may enhance psychiatric difficulties and make them reach higher total scores for vigorexy.

Relating to exercise dependence, both groups presented the same level of dependence for all the seven symptoms of this disease. The symptoms we have analyzed are the withdrawal from physical exercise by reducing and suspended it, the capacity of keeping on exercising when the individual is severely injured or after knowing his problems have been caused by excessive training. We also studied the tolerance to increasing the intensity and time of exercising and consequent loss of control. Besides that, recreational and occupational activities from exercising, time spent on excessive exercising and exercises that demand longer time than expected were taken into consideration in this study[23,24].

The same was analyzed when taking vigorexy into consideration. Both samples presented the same probability to have the disease based on all three symptoms. These symptoms include constant concern on body size, intolerance to appearance and all its correlated behaviors, and functional damages which are part of sick people's lives and are diagnosed as depression, anxiety, and antisocial behavior and missing work[17,20].

Analyzing the averages of exercise dependence, bodybuilders reached higher scores on symptoms as tolerance, lack of control, time and decrease of activities. Gymgoers scored higher on symptoms as withdrawal, continuity, intention and total scores, though. In all previous studies, men scored higher than women in all symptoms of exercise dependence[11,14,25]. However, when we take the averages concerning vigorexy, bodybuilders scored higher on symptoms as functional defects and total score and gymgoers scored higher on size intolerance to appearance. Hildebrandt *el al.*[20] showed that gymgoers having size as symptom had a higher score reaching 28.6%. Likewise, our study showed that prevalence in both samples. According to Hausenblas and Fallon[14], these symptoms are often caused by anxiety and body image. Otherwise, our study has shown that intolerance to appearance was the lesser scored symptom of vigorexy in both samples and Hildebrandt *et al.*[20] presented functional defects as the lesser scored symptom.

Analyzing the variables of practicing physical exercise as time of practice (years), weekly frequency (days) and session time (minutes) with dimensions of frequency of exercise dependence and vigorexy presented significant results. Time of exercise practice is not associated to intentional effects and intolerance to appearance. Following parameters for exercise dependence presented by Downs *et al.*[24], we have found that the longer the practice time, the more satisfied with appearance and better control over his training the individual will keep exercising time and intensity planned before starting the training session[14].

Weekly time of exercising session was the variable that had a higher correlated effect and was associated to most dimensions of exercise dependence (withdrawal, continuity, loss of control, time, intentional effects and total score). We have observed that the longer the exercising session, the higher the probability of individuals to be exercise dependent, mainly on symptoms that that correlation was significant[26]. That is, the higher the exercising session, the higher probability of having symptoms like withdrawal, anxiety and depression when physical activity is restricted. Besides that, there are greater chances that the individual will keep on practicing even if he is severely injured and lose control of intensity and practice time and keep pushing on these variables[10,27]. Thus, the longer the training, the higher probability that the individual believes time is insufficient and keeps practicing longer hours than it has been planned previously[24].

Analyzing all the data presented we may infer that gymgoers usually practice physical activity longer than bodybuilders and also present a higher weekly frequency. Yet, time spent on daily physical activity is longer for bodybuilders. These differences were significant and that make us focus on continuity of physical activity for gymgoers provided that bodybuilders may follow different sport seasons and consequently practice harder[8,28].

According to Hausenblas and Downs[9], three or more out of seven symptoms for risk are necessary to diagnose exercise dependence. Downs *et al.*[24] has designed three levels of exercise dependence: at risk, non-dependent symptomatic and non-dependent asymptomatic. Following that criteria, we have identified nine (5.1%) individuals at risk of exercise dependence, 104 (59.1%) non-dependent symptomatic and 63 (35.8%) non-dependent asymptomatic.

However, individuals need to present three variables from Muscle Dysmorphic Disorder Inventory to be considered as having vigorexy. Based on data collected for our study, gymgoers scored higher on symptoms related to size and intolerance to appearance whereas bodybuilders scored higher for symptoms related to functional defects and total score for vigorexy[4,22].

Comparing levels of vigorexy in exercise dependent groups (dependent or at risk, non-dependent symptomatic and non-dependent asymptomatic), we have observed that significant differences were kept among groups for all scales as well as for the total score. That is, we found there is the tendency to increase levels of vigorexy along with the increase of exercise dependence.

Finally, Smith and Hale[15] found that correlation between vigorexy and bodybuilding dependence is not related to gender and that there are no correlations between anabolic steroids and bodybuilders. Because of that, many hypotheses on exercise dependence and vigorexy will be clarified.

CONCLUSION

Our study has found no significant differences among gymgoers and bodybuilders by comparing levels of vigorexy and exercise dependence. That also happens when we compared dimensions of exercise dependence and symptomatic vigorexy.

Session time of exercising is correlated to most dimensions of exercise dependence. Yet, no dimensions of vigorexy showed values that presented similar correlation.

Groups named as dependent or at risk of exercise dependence showed higher average levels of vigorexy. So, we were able to see there was a tendency to increase vigorexy levels related to increasing risk of exercise dependence.

Our study had some limitations related to the absence of instruments to trace a grade cut-off for vigorexy in the 21-item questionnaire used in this study. Besides, there are the restrictions to samples, individuals' shyness, and doubtful answers as well as lack of incentive like gifts or financial support to motivate individual enrolled for the study.

We suggest that studies on that matter to be done using a vigorexy questionnaire with grade cut-off to better illustrate the relation between exercise dependence and vigorexy for such groups. Studies on these disorders among other groups need further investigation.

All authors have declared there is not any potential conflict of interests concerning this article.

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