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Abstract

In the present study, we investigated whether binge/purge eating disorders (ED) and pathological gambling (PG) in males can be differentiated by means of weight history and temperament and character traits. We investigated 43 male ED patients, 46 pathological gamblers and 46 healthy controls (HC) by means of lifetime weight information and the Cloninger's Temperament and Character Inventory-Revised (TCI-R). The MANCOVA results showed that ED patients showed significantly more lifetime weight fluctuations compared with PG and HC after controlling for age. Additionally, both ED and PG patients showed significantly higher scores on Harm Avoidance and lower Self-Directedness compared with HC. Results of a multinomial logistic regression showed that ED versus HC membership was determined by more weight fluctuations and lower Self-Directedness; whereas ED versus PG membership was determined by more weight fluctuations. Finally, PG versus HC membership was characterized by more Harm Avoidance, Novelty Seeking, and Persistence, and less Self-directedness. Given that both patient groups were characterized by low levels of Self-Directedness (i.e., low levels of effortful or executive control), they can benefit from training in self-regulation; and in PG patients special attention needs to be given on the training of behavioral control in the presence of novel and rewarding stimuli.

INTRODUCTION

Both EDs of the bingeing/purging type and PG in men can be considered impulse-control disorders, characterized by a failure to resist an impulse, drive, or temptation to perform an act that is harmful to the person or to others (Alvarez-Moya et al., 2007). ED and impulse control disorders have shown similar behavioral patterns in animal (Avena, 2007; Avena, Bocarsly, Rada, Kim, & Hoebel, 2008; Bocarsly, Rada, Kim, & Hoebel, 2008a) as well as in human studies (Fernandez-Aranda et al., 2006, 2008). Both disorders have also shown common biological and environmental risk factors (Jackson, Grilo, & Masheb, 2000; Tchanturia et al., 2012), and shared clinical-psychopathological symptoms and cognitive vulnerabilities in female clinical samples (Claes et al., 2012b).

Weight Fluctuations and ED Although previous studies have associated pre-morbid obesity/overweight to the development of ED in males (Fernandez-Aranda et al., 2004; Nuñez-Navarro et al., 2012), some studies have shown that both binge eating disorder and bulimia nervosa in males are associated with a history of marked weight fluctuations (Spitzer et al., 1992). This is not surprising given that weight fluctuation is strongly associated with negative psychological attributes in both normal weight and obese individuals (Foreyt et al., 1995), as well as abnormal eating patterns (including dieting and overeating episodes; Foreyt et al., 1995) and eating disorders (Villarejo et al., 2012), namely due to binge/purge/dieting vicious circle.

Personality Traits in Male ED and PG Furthermore, temperament and character traits were more often investigated in male ED and PG patients separately (Claes et al., 2012b; Granero et al., 2009; Nuñez-Navarro et al., 2012) however, few studies investigated both male ED and PG samples together. As a guiding framework, we will use Cloninger's psychobiological personality model, which is widely used in clinical research. This model consists of four innate temperament dimensions (novelty seeking, harm avoidance, reward dependence, and persistence) and three acquired character dimensions (self-directedness, cooperativeness, and self-transcendence; Cloninger, 1999).

In male ED patients, both anorectic and bulimic patients scored significantly higher on the temperament dimension Harm Avoidance compared to healthy controls (Alvarez-Moya et al., 2007; Fernandez-Aranda et al., 2004; Fassino et al., 2001); whereas anorectic patients scored significantly higher on Persistence and lower on Reward Dependence (Fassino et al., 2001). With respect to character traits, both anorectic and bulimic patients scored significantly lower on Self-Directedness compared to healthy controls (Alvarez-Moya et al., 2007; Fernandez-Aranda et al., 2004; Fassino et al., 2001), whereas anorectic patients scored significantly lower on Cooperativeness (Fassino et al., 2001).

In male gamblers, the results of many studies showed that they scored significantly higher on the temperament dimensions Harm Avoidance and certainly Novelty Seeking; whereas they scored significantly lower on the character dimensions Self-Directedness and Cooperativeness (Alvarez-Moya et al., 2007; Forbush et al., 2008; Granero et al., 2009; Nordin & Nylander, 2007).

Two studies (Alvarez-Moya et al., 2007; Fernandez-Aranda et al., 2006) compared bulimia nervosa patients with pathological gamblers. Alvarez-Moya et al. (2007) showed that male/female bulimic patients showed lower levels of Novelty Seeking and Self-Directedness than male/female pathological gamblers. Whereas Fernandez-Aranda et al. (2006) compared female pathological gamblers with bulimia nervosa patients with and without another impulse-control disorder (ICD) [BN+ICD; BN-ICD], and showed that high Novelty Seeking was more strongly related with PG and BN+ICD than BN-ICD; and low Self-Directedness was more strongly related with BN+ICD than with PG. However, there is a lack in the literature regarding whether binge/purge eating disorders (ED) and pathological gambling (PG) in males can be differentiated by means of weight history, temperament, and character traits.

The aims of the present study were twofold: (a) to differentiate between male ED patients, PG, and healthy controls by means of weight history and the Cloninger's temperament and character dimensions, and (b) to determine the capacity of weight fluctuations and different temperament and character dimensions to classify binge/purge EDs and PGs compared to healthy controls. Based on the literature review, we hypothesize that in male patients binge/purge EDs are related to more weight fluctuations and high Harm Avoidance and low Self-Directedness; whereas PG is related to high Harm Avoidance, high Novelty Seeking, and low Self-Directedness. Compared to patients with PG, we expect that ED patients score lower on Novelty Seeking and lower on Self-Directedness.

METHOD

Participants

Our sample consisted of 135 male participants of whom 43 were ED patients (31.9%, no AN-R patients included), 46 pathological gamblers (34.1%), and 46 HC (34.1%). All participants with ED and PG were diagnosed according to the *DSM-IV* criteria by means of the structured clinical interview for *DSM-IV* Axis I Disorders (First, Spitzer, Gibbon, & Williams, 1997), conducted by experienced psychologists and psychiatrists with more than 15 years' experience in the PG and ED field. The ED and PG participants were consecutive referrals for assessment and treatment at the Department of Psychiatry of the University Hospital of Bellvitge in Barcelona (Spain).

For the purpose of the present study, we selected 43 male ED patients except restrictive anorexia nervosa patients: 5 AN-BP (11.6%), 23 BN-P (53.5%), 1 BN-NP (2.3%), 12 EDNOS-BN (27.9%), and 2 BED (4.7%). In the group of 46 pathological gamblers, 93.5% were mainly slot machine players.

The 46 healthy controls were recruited from individuals who were visiting the hospital for routine blood tests, excluding patients with a history of mental illness, and specifically PG, ED, and substance abuse/dependence.

The mean age of the binge/purge ED patients was 23.12 ($SD = 4.24$), of the pathological gamblers 30.22 ($SD = 4.95$) and of the healthy controls 23.87 ($SD = 4.21$). The pathological gamblers were significantly older than both the ED patients and the healthy controls [$F(2, 132) = 34.19, p < .001$].

The Ethics Committee of the University Hospital of Bellvitge approved the study, and informed consent was obtained from all participants.

Instruments

To assess lifetime weight fluctuations we subtracted the minimum lifetime weight from the maximum lifetime weight (reported in kg), as reported by the patients and healthy eating/weight controls while assessing socio-demographic and weight-related variables during a face-to-face interview.

To assess the personality characteristics we made use of the Temperament and Character Inventory-R (TCI-R; Cloninger, 1999). The TCI-R consists of 240 items to be rated on a 5-point Likert scale. The TCI measures 4 temperament (e.g., Harm Avoidance) and 3 character dimensions (e.g., Self-Directedness). The

TCI-R has been validated in the Spanish population (Gutiérrez-Zotes et al., 2004) and showed internal consistency coefficients ranging from .77 to .84.

Statistical Analyses

Statistical analyses were carried out by means of SPSS version 19 (SPSS, Chicago, IL). To compare the mean TCI-R scores among the three groups (ED, PG, and NC) we used a MANCOVA with the weight fluctuation and the TCI-R scales as dependent variables, group status as independent variable and age as covariate. To assess whether the weight fluctuation and the 7 TCI-R scales were able to classify diagnostic status of the participants (ED, PG, and NC), we used a multinomial logistic regression analysis (enter method). Odds ratios were obtained for each parameter, and the Nagelkerke R² was used to measure the global predictive capacity of the model.

RESULTS

Table 1 shows the means and standard deviations of the weight fluctuation and the TCI-R scales for HC, ED, and PG patients. Overall, we found significant differences between the three groups on all variables [Willks' Lambda = 0.58; $F(16, 248) = 4.84, p < .001$]. With respect to weight fluctuations, ED patients scored significantly higher compared to both PG and HC. With respect to the heritable temperament dimensions, ED and PG patients scored significantly higher on Harm Avoidance compared to HC. On the acquired character scales, ED and PG patients scored significantly lower on Self-Directedness compared to the HC.

To assess the extent to which weight fluctuation and character and personality dimensions were associated with group membership, we applied a multinomial logistic regression (Table 2). When comparing HC and ED patients, higher scores on weight fluctuations and lower scores on Self-Directedness were more strongly associated with the ED diagnosis. When comparing HC and PG, higher scores on Novelty Seeking, Harm Avoidance, and Persistence and lower scores on Self-Directedness were more strongly associated with the PG diagnosis. And finally, when comparing PG and ED patients, higher scores on weight fluctuations were more strongly related with the ED diagnosis.

DISCUSSION

In the present study, we investigated whether male ED and PG patients and HC can be differentiated by means of weight fluctuations and temperament and character traits. Overall, we found that male PG patients were significantly older than male ED patients and HC, so age was taken into account as control variable in our analyses.

With respect to the mean level differences among ED, PG, and HC, we found that male ED patients showed significantly higher lifetime weight fluctuation scores compared to PG and HC; results which confirm the importance of lifetime weight fluctuations in the presence of eating disorders in males (see also Spitzer et al., 1992). Additionally, both ED and PG patients scored significantly higher on Harm Avoidance and lower on Self-Directedness compared to HC. These results are similar to previous studies in male and female ED and PG patients, in which ED and PG pathology is related to high levels of Harm Avoidance and low levels Self-Directedness (e.g., Alvarez-Moya et al., 2007; Claes et al., 2011, 2012a). In fact, these personality traits have been identified as associated factors for the development of PG (Alvarez-Moya et al., 2010) and ED (Claes et al., 2011). Both ED and PG pathology in males can thus be considered an avoidance behavior of negative affect, where gambling and eating symptoms are used to relieve emotional distress. Furthermore, both ED and PG are characterized by low levels of self-directedness, which refers to the inability of an individual to control, regulate, and adopt his/her behavior to reach an individually chosen goal. Lack of top-down control gives "free-play" to the innate reactivity (HA, NS) and are often associated with psychopathology. For example, high harm avoidance and low self-directedness are also characteristic for anxiety and depression, Axis I symptoms which are often related ED (see Bulik, 2002, for an overview) and PG (Jiménez-Murcia et al., 2009; Potenza et al., 2005).

According to the results of the multinomial logistic regression analysis which investigated the capacity to differentiate among ED, PG, and HC, we found that ED membership was related to more weight fluctuations and less Self-Directedness compared to HC; whereas PG was related to more Harm Avoidance, Novelty Seeking, and Persistence and less Self-Directedness compared to HC. Novelty seeking is the

tendency to respond quickly to stimuli leading to pursuit of rewards and escape from punishment (Mardaga & Harsenne, 2007). Many other disorders are characterized by high levels of novelty seeking (BAS reactivity), such as pathological buying, alcohol abuse, and drug abuse (in ED: Willem, Bijttebier, & Claes, 2010; in PG: Slutske et al., 2000); which are also co-morbid with PG. Furthermore, PG patients also show significantly higher levels of Persistence compared to HC, referring to perseverance despite frustration and fatigue. Maybe the intermittent reinforcement schema of gambling (often losing, but sometimes winning) makes the pathological gambling so addictive and motivates these patients to continue gambling despite frustration (losing). Finally, ED was related to more weight fluctuations compared to PG.

In sum, the results show that male ED patients are characterized by more weight fluctuations than HC and PG; PG are characterized by higher scores on harm avoidance, novelty seeking, and persistence than HC, whereas both ED and PG are characterized by lower levels of Self-Directedness compared to HC. Finally, given that both ED and PG behaviors are driven by low levels of self-directedness, they could both benefit from a trans-diagnostic approach focused on personality traits, where training of self-control and emotional regulation strategies, especially regarding modulation of negative affect (Fernandez-Aranda et al., 2012; Jimenez-Murcia et al., 2009) will be considered, whereas PG patients certainly need to learn behavior control in situations characterized by high levels of novelty or sensations.

Besides the strengths of our research, the study needs to be evaluated within the context of several limitations: (a) our sample only consisted of male patients, so future studies should also include female patients to control for possible gender differences (e.g., Alvarez-Moya et al., 2007); and (b) our study was completely based on self-report measures of temperament and character dimensions, so future studies could include behavioral and neuropsychological measures to assess personality features. But despite these limitations, our study was able to show that weight fluctuations and personality characteristics are valuable variables to understand similarities and dissimilarities between both groups.

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Table 1

	Healthy controls (1) (N = 46)		ED patients (2) (N = 43)		Pathological gamblers (3) (N = 46)		F(2,131)	Post-hoc comparisons
	M	(SD)	M	(SD)	M	(SD)		
Weight max-min (kg)	13.49	12.49	30.74	16.73	17.89	11.45	22.31***	2 > 1, 2 > 3
Novelty seeking	107.65	12.54	106.12	15.08	111.80	13.67	1.63	
Harm avoidance	88.41	16.71	106.02	22.22	99.33	16.95	10.24***	2 > 1, 3 > 1
Reward dependence	103.17	13.61	98.51	17.82	97.35	14.99	1.74	
Persistence	110.54	20.46	108.60	23.47	113.20	20.60	0.55	
Self-directedness	140.78	21.69	121.12	21.07	127.61	20.16	10.78***	1 > 2, 1 > 3
Cooperativeness	133.91	20.12	127.84	16.89	131.13	17.27	1.46	
Self-transcendence	60.52	13.85	65.44	14.06	59.98	14.23	1.97	

Table 2

	ED vs. HC (RC)			PG vs. HC (RC)			ED vs. PG (RC)		
	p	OR	95% CI	p	OR	95% CI	p	OR	95% CI
Weight max-min (kg)	<.001	1.10	1.05–1.16	.77	1.00	.95–1.06	<.01	1.09	1.04–1.15
Novelty seeking	.51	1.01	0.97–1.05	.04	1.05	1.00–1.10	.15	.96	.92–1.01
Harm avoidance	.09	1.03	.99–1.08	.04	1.04	1.00–1.09	.72	.99	.94–1.03
Reward dependence	.88	1.00	.95–1.05	.43	.98	.93–1.02	.39	1.02	.97–1.07
Persistence	.14	1.02	.99–1.05	.01	1.04	1.00–1.07	.27	.98	.95–1.01
Self-directedness	.06	0.96	.92–1.00	.04	.95	.91–.99	.81	1.00	.96–1.05
Cooperativeness	.99	1.00	.95–1.04	.59	1.01	.96–1.05	.62	.98	.94–1.03
Self-transcendence	.41	0.98	.93–1.02	.02	.94	.89–.99	.10	1.04	.99–1.09
Nagelkerke R ²	0.67								