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## Influence of perfectionism on variables associated to eating disorders in dance students

Jon Arcelus\* Ana García-Dantas\*\* Milagrosa Sánchez- Martín\*\*\* and Carmen Del Río\*\*

### *INFLUENCE OF PERFECTIONISM ON VARIABLES ASSOCIATED TO EATING DISORDERS IN DANCE STUDENTS*

**KEY WORDS:** Concern over Mistakes, Personal Standards, Body Dissatisfaction, Performance Anxiety, Depression, Diet, Debilitative Perfectionism.  
**ABSTRACT:** The aim of the present study was to examine the influence of the main two elements of perfectionism (CM, concern over mistakes and PS, personal standards) on eating disorders risk factors in dancers. Based on the literature, we tested the role of CM and PS over diet and mood related symptoms, and the function of performance anxiety and body dissatisfaction as the main mediators in the model. Two hundreds and eighty one female dancers ( $M = 15.28$ ;  $SD_{age} = 2.32$ ) from two Spanish dance conservatoires participated in this study. Structural modelling was used to test the hypothesized model. Results confirm the different influence of PS and CM on dieting and the presence of symptoms of mood disorders and performance anxiety just in the debilitative perfectionism path. In conclusion, the presence of CM might be key to differentiate dancers at higher risk of eating disorder due to its association with the variables traditionally associated to this.

Dancers have been found to be at risk of developing eating disorders (ED) (e.g., Benn and Walters, 2001; Ribeiro and Da Veiga, 2010; Ringham et al., 2006; Schluger, 2009). A recent systematic review and meta-analysis has shown dancers having three times higher risk of suffering from eating disorders, particularly anorexia nervosa and Eating Disorders Not Otherwise Specified (EDNOS), than non-dancers (Arcelus, Witcomb and Mitchell, 2014). The high levels of eating psychopathology found among dancers could point at the dance world (Schlunger, 2009) or dancers personality (high levels of perfectionism and high levels of body dissatisfaction) as risk factors for the development of these conditions (Fairburn, Cooper, Doll and Welch, 1999; Penniment and Egan, 2012; Sassoroli et al., 2011; Wade and Tiggemann, 2013).

Body dissatisfaction has also been associated to food restriction and dieting, depressed mood (Stice, Marti and Durant, 2011) and poor levels of self-esteem (Neumark-Sztainer et al., 2006; Stice, 1997) all known to be factors associated to the development of eating disorders. The idealisation of thinness within the dance world has been found to promote body dissatisfaction among dancers and eating disorders as a result (Heiland, Murray and Edley, 2008; Stice and Whitenton, 2002) possibly influenced by the high levels of depression (38%) (Marchant-Haycox and Wilson, 1992), anxiety (Carr and Wyon, 2003), including performance anxiety (Hanrahan, 1996; Kobori, Yoshie, Kudo and Ohtsuki, 2011) and body dissatisfaction identified among dancers (Cumming and Duda, 2012; Paredes, Nessier and Gonzalez, 2011).

Another personality characteristic known to be more prevalent in ED (Borda et al., 2011) and commonly found in dancers (e.g., Goodwin, Arcelus et al., 2014; Cumming and Duda, 2012; Nordin-Bates, Cumming, Aways and Sharp, 2011; Thomas, Keel and Heatherton, 2005) is perfectionism. Perfectionism has been described as a multi-dimensional construct by several authors (Frost, Marten, Lahart and Rosenblate, 1990; Hill et al., 2004). Some of the perfectionism elements associated to eating disorders include Concern over Mistakes (CM) and Personal Standards (PS) as described by Frost et al. (1990), and Conscientious Perfectionism (high standards) (CP) and Self-Evaluative Perfectionism (SP) (self-criticism) as described by Hill et al. (2004). Those dimensions are considered to be key constructs within perfectionism (e.g., Nordin-Bates et al., 2011). PS (which is similar to CP) is an internal motivation to set and strive for achieving high goals (Gaudreau and Thompson, 2010) and it has also been considered as a desire to succeed and reach challenging goals (Nordin-Bates et al., 2011). In contrast SP (similar to CM) consists of perceived parental pressure, rumination, need for approval and concern over mistakes (Gandreu and Thompson, 2010). Some authors have described PS and CP as helpful aspect of perfectionism (e.g., Fioresse, Andrade, and López, 2013), while CM and SP as unhelpful or debilitative one (e.g., Stoeber and Otto, 2006).

According to a maintenance model for ED, debilitative perfectionism has a direct association with core ED psychopathology in individuals with a diagnosis of eating disorders (Tasca, Presniak, Demidenko et al., 2011). Additionally,

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the literature has found a high association between CM and ED (e.g., Bulik, Tozzi, Anderson, Mazzeo et al., 2003; Wade and Tiggemann, 2013), as well as ED with other co-morbid symptoms such as depressive (Borda-Más, Torres-Pérez and del Río-Sánchez, 2008; Jain and Sudhir, 2010; Toro et al, 2009), and anxiety related psychopathology (Heimberg, Frost, Holt, Mattia and Faccenda, 1996; Solano and Cano, 2013). Goodwin et al., (2014) investigated the role of CP (high standards), in 254 female ballet dancers. They found that SP and CP predicted eating psychopathology. However, the relationship between CP and ED was fully mediated by SP.

Although within the dance world, perfectionism has been found to be associated with eating disorders (Goodwin et al.,

2014), it does feel important to explore this association in more details and within different dance styles as well as to investigate the pathways involved in this relationship. With this in mind, this study has two aims. Firstly to replicate Goodwin et al. (2014) study in a different population of dancers by exploring the association between the two main elements of perfectionism (CM and PS) with variables known to be risk factors for the development of eating disorders (i.e., negative mood, performance anxiety, body dissatisfaction and diet restriction). Secondly to extent this study and to assess the role of some of the above variables in mediating the relationship between perfectionism and eating disorders risk factors.

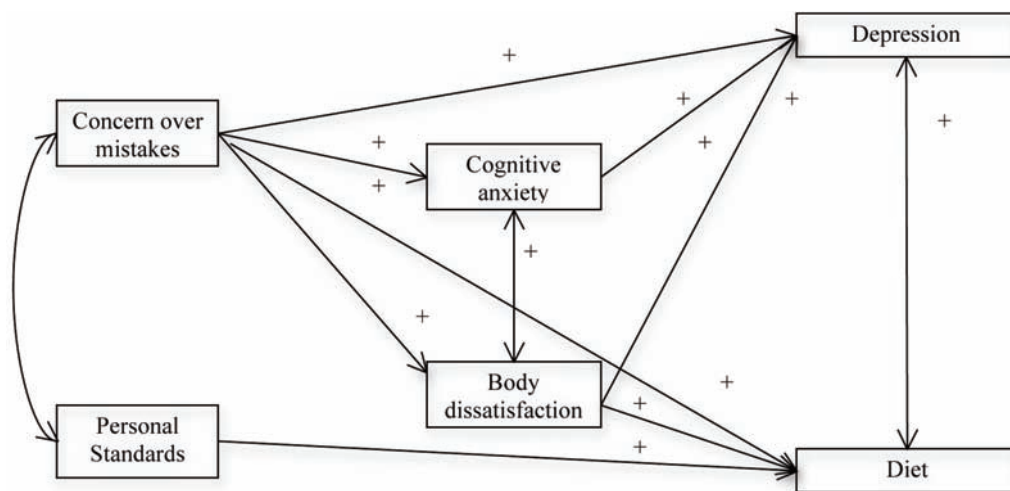


Figure 1. Theoretical model proposed about the influence of types of perfectionism over performance cognitive anxiety, body dissatisfaction, depression and food restriction.

Based on the above literature, we have developed a risk model for dancers shown in Figure 1.

We predict that there will be two different paths: a “positive” one based on healthy perfectionism and dance aesthetic standard (PS), and a “negative” path based on CM, mediated by body dissatisfaction. We predict that depressive symptoms will also relate to the two components, positively with concern over mistakes and negatively with personal standards (Douilliez and Lefèvre, 2011; Jain and Sudhir, 2010; Minarik and Ahrens, 1996). Finally, it is expected that both CM and body dissatisfaction will influence performance anxiety (Juster, Heimberg, Frost, Holt, Mattia and Faccenda, 1996) and performance anxiety will be associated to CM as it identified in previous study (Kobori, Yoshie, Kudo and Ohtsuki, 2011).

## Method

### Participants and procedure

Two hundred and eighty one participants were recruited via their school teachers from two professional dance conservatories

in Spain. Inclusion criteria were: female and aged 12-20. Participation was voluntary. In under age participants, informed consent was also obtained from their parents. Each participant completed a set of questionnaires assessing perfectionism, performance anxiety, body dissatisfaction, eating attitudes, and symptoms of depression. Participants had their height and weight measured. The approximate time that students spent filling the questionnaire was 30 minutes. The study obtained ethical approval from the organization.

### Data analysis

Before creating an estimated model, a correlation analysis was performed between variables to explore and eliminate, if necessary, independent variables whose correlation was greater than .7 in absolute value, thus eliminating possible problems of multicollinearity. The presence of variables with low correlations with the dependent variables ( $r < .2$ ) were analysed also.

The SPSS 21.0 program was used for the descriptive statistics. Structural equation model testing was performed using EQS 6.1, which uses the maximum likelihood estimation (ML) to examine the fit of models of their respective observed variance-

covariance matrices. We have to note that first we tried to estimate a model in which bulimia was another endogenous variable, but the indices do not fit. Thus, we decided to choose food restriction, because of the higher correlations with the rest of variables.

Since the requirement that data have a multivariate normal distribution was not satisfied (Mardia's coefficient = 6.15; value higher than 5.00; Bentler, 2005), robust estimators were used. Consistent with Hoyle and Panter's (1995) recommendations, the overall goodness of fit model overall was assessed using a set of global fit indices: the Satorra-Bentler robust  $\chi^2$  test statistics (S-ratios < 3 indicate reasonable fitting models), the robust comparative fit index (CFI, with values .90 or over indicating better fitting models), and the root-mean-square error of approximation (RMSEA, with values of .05 or less indicating close fit).

To perform the Path analysis, the "Model Development Strategy" (Jöreskog, and Sörbom, 1993) was used based on theoretical predictions from the literature (see Figure 1). This model was then successively modified based on the significance of estimated coefficients. Any direct effects that were not significant were eliminated.

### Instruments

**Perfectionism.** Two subscales from the validated Multidimensional Perfectionism Scale by Frost were employed (Frost et al., 1990; Spanish adaptation done by Carrasco, Belloch and Perpiñá (2010). PS was measured by the scale of *personal standards* and the scale of *concern over mistakes* (reference?). Responses to each item were recorded on a Likert-type scale ranging from: 1 (strongly disagree) to 5 (strongly agree). In this sample, the reliability was satisfactory for both subscales ( $\alpha$  for CM = .90;  $\alpha$  for PS = .83).

**Performance anxiety.** This subscale consists of 5 items from the *Revised Competitive State Anxiety Inventory-2* (CSAI-2R; Cox, Martens and Russell, 2003; translated into Spanish by Andrade, Rio and Arce, 2007). Some items were adapted to a more dance specific vocabulary (instead of play, dance or perform). The reliability of the subscale in this study was satisfactory ( $\alpha$  = .82).

**Depression symptomatology.** *Beck Depression Inventory-II* (BDI-II; Beck, Steer and Brown, 1996; Spanish adaptation by Sanz, Vázquez and Navarro, 2003) was administered. It has 21 items (range from 0 to 63 scores). In this sample, the index of reliability was acceptable ( $\alpha$  = .88).

**Body Dissatisfaction.** *Body Shape Questionnaire* (BSQ) by Cooper, Taylor, Cooper and Fairburn (1987) and adapted to Spanish population by Raich, Mora, Soler, Avila, Clos and Zapater (1996). It is a 34-item questionnaire on a likert scale from 1 to 6. The index of reliability was satisfactory in our sample ( $\alpha$  = .98).

**Diet.** The Diet subscale (13 items) belongs to the *Eating Attitude Test* (EAT- 26; Garner, Olmsted, Bohr and Garfinkel, 1982; Spanish adaptation by Gandarillas, Zorrilla, Muñoz et al., 2002). In this sample, the index of reliability was acceptable ( $\alpha$  = .82).

## Results

### Preliminary descriptive analysis

Four hundred twenty students were invited to take part in the present study and 369 accepted to participate. Finally, 281 participants were included in the present study as the inclusion criteria was female dancers ranged from 12 to 20 years old ( $M$  = 15.28;  $SD$  = 2.32). The approximate mean age of dance experience was 7 years. Out of the 281 dancers 93 (33.1%) were Ballet, 22 (7.83%) Contemporary, 86 (30.6%) Flamenco and 80 (28.47%) Spanish folk dancers (regional dance similar to flamenco but with similar features to ballet for example the half pointe ballet shoes). The mean body mass index was above 20 ( $M$  = 20.27;  $SD$  = 3.10) and varied according to the dance type; Ballet ( $M$  = 19.54;  $SD$  = 1.81), Contemporary ( $M$  = 18.73;  $SD$  = 1.99), Flamenco ( $M$  = 21.41;  $SD$  = 2.87), Spanish folk dancers ( $M$  = 20.80;  $SD$  = 2.66).

Table 1 displays the means, standards deviations and correlations between the contributing variables to the model. As shown, all correlations were positive and statistically significant. Concern over mistakes was significantly related to personal standards, body dissatisfaction, and depression. Correlations between body dissatisfaction, depression, and food restriction were also high.

	<i>M</i>	<i>SD</i>	Diet	CM	PS	BD	DE	CA
Diet	5.82	6.31	1	.58**	.46**	.81**	.56**	.35**
Bulimia	.90	1.97	.55**	.44**	.33**	.47**	.41**	.20**
Control oral	3.16	2.98	.22**	.22**	.56**	.09	.23**	.13*
CM	2.14	.83	.58**	1				
PS	2.93	.88	.46**	.67**	1			
BD	2.39	1.23	.81**	.64**	.43**	1		
DE	7.52	7.09	.56**	.61**	.45**	.62**	1	
CA	2.33	.82	.35**	.46**	.31**	.49**	.48**	1

Note. CM: Concern over mistakes; PS: Personal standards; BD: Body dissatisfaction; DE: Depression; CA: Performance cognitive anxiety

\*\*  $p < .01$  \*  $p < .05$

Table 1. Descriptive statistics and correlations between variables (N = 281).

## Model of mediation

The estimated model's fit to the data was satisfactory. Respect to the measures of goodness of fit, the  $S-B\chi^2/df$  was under 2 ( $7.03/6 = 1.17$ ); the RMSEA was .025 (C.I. 90% 00 - .08); and incremental fit measures (NFI, NNFI, CFI and IFI) were .99. The

error terms were excluded from the figure, although they were estimated. The estimated model "Path" was carried out using summary scores for each variable. Figure 2 shows the resulting structural model.

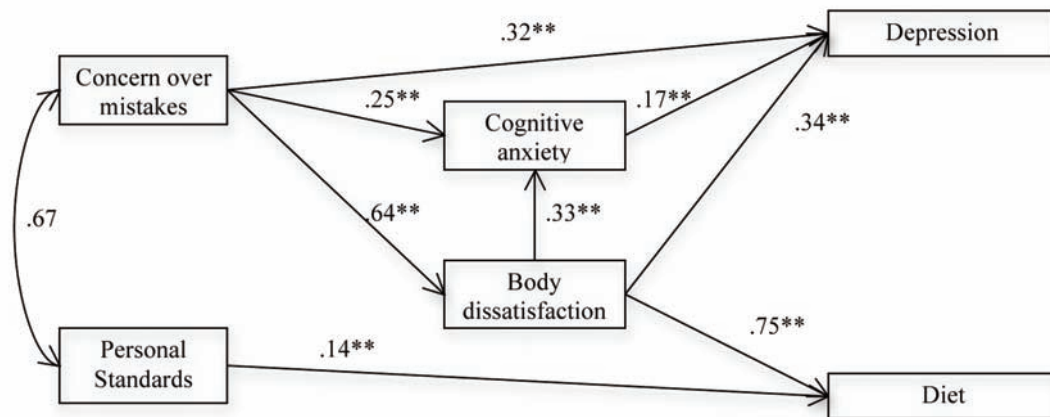


Figure 2. Structural model about the influence of types of perfectionism over performance cognitive anxiety, body dissatisfaction, depression and food restriction.

Additionally, large amounts of variance were accounted for by the model for food restriction (.67), body dissatisfaction (.41), depression, (.48) and performance cognitive anxiety (.28). The majority of the proposed relationships in the theoretical model are confirmed in the estimated model (see Figure 2). Two direct relationships that were not found to be significant ( $p \geq .05$ ;  $-2 \leq t \leq 2$ ) were eliminated from the proposed model.

As expected, CM was found to be directly, and positively correlated to: performance cognitive anxiety ( $t = 3.56$ ), body dissatisfaction ( $t = 14.82$ ) and depression ( $t = 4.86$ ); but there was no direct correlation with food restriction ( $p > .05$ ;  $-2 \leq t \leq 2$ ). Indirectly, CM was found to affect depression through three pathways: through performance cognitive anxiety ( $r = .04$ ), through body dissatisfaction ( $r = .22$ ) and through the combination of those two variables ( $r = .04$ ). CM had other indirect effects both on diet, ( $r = .48$ ) and on performance cognitive anxiety ( $r = .21$ ), through body dissatisfaction. In contrast, PS only had a direct effect on food restriction ( $t = 3.45$ ).

Performance cognitive anxiety was found to be directly correlated to levels of depression ( $t = 3.44$ ). In respect to body dissatisfaction, it directly affects performance cognitive anxiety ( $t = 4.81$ ), diet ( $t = 17.17$ ) and depression ( $t = 5.13$ ); indirectly, it influences to depression, though performance cognitive anxiety ( $r = .06$ ).

With respect to the statistical significance of the direct effects, note that they all exhibited a high level of significance ( $p < .05$ ;  $2 \geq t \geq 2$ ). Similarly, the results highlight the significance of total indirect effect of CM over diet ( $r = .48$ ;  $t = 12.29$ ), over depression ( $r = .30$ ;  $t = 6.08$ ) and over performance cognitive anxiety ( $r = .21$ ;  $t = 4.63$ ). Also significant, although to a lesser extent, the indirect effect of body dissatisfaction on depression ( $r = .06$ ;  $t = 2.91$ ).

In light of the estimated model's (Figure 2) description of the direct and indirect effects, the results confirm the important role of CM versus PS, limiting the effect of the latter type of perfectionism to dietary behaviors. We can verify that for almost all the endogenous variables, the most influential exogenous variable would be concern over mistakes.

Specifically, with regard to depression, the variables that have a greater total effect (direct and indirect) on it are CM (.62), being very similar its direct (.32) and indirect (.30) effect; followed by body dissatisfaction (.4), in this case the effect is greater directly (.34) than indirectly (.06). Respect to food restriction, body dissatisfaction is the variable that most affects diet, in a directly way (.75); followed by CM, mediated by body dissatisfaction (.48) and, finally, the direct effect of PS (.14). Taking into account performance cognitive anxiety, CM is, again, the variable that most influence exerts on it (.46); that effect is similar either directly (.25) or indirectly (.21), through body dissatisfaction. Similarly, body dissatisfaction was found to be the main mediating variable, especially in the case of depression and food restriction.

## Discussion

The aim of the current study was to examine the association between the two main elements of perfectionism (CM and PS) with variables known to be risk factors for the development of an eating disorder in the population of dance students and to investigate the pathways for this association using structural equation modelling.

We developed a risk model for dancers based on the literature, (shown in Figure 1) and tested it with data from a large sample of Spanish dance students using structural equation modelling.



The study showed that the data was a good fit for the theoretical model proposed. These results confirm previous studies suggesting a distinction between the two main elements of perfectionism (concern over mistakes and personal standard; Stoeber and Otto, 2006). These two constructs differently influence variables that have been associated with the risk of developing an ED (Stice, Marti and Durant, 2011). The study found that dieting was associated with high concern over mistakes, which were mediated, by body dissatisfaction and high personal standards. Body dissatisfaction was found to influence performance cognitive anxiety, and depression, which was also influenced to concern over mistakes, performance cognitive anxiety and body dissatisfaction. Perhaps surprisingly, dieting was not found to be related to depressive symptomatology in dancers, as occurs in ED patients (Behar, Barahona, Iglesias and Casanova, 2007).

The findings confirm the strong relationship between body dissatisfaction and dieting as found in previous studies (Van den Berg, Thompson, Obremski-Brandon and Covert, 2002). Findings also support the studies that show an association between body dissatisfaction and anxiety (e.g., Behar, Barahona, Iglesias and Casanova, 2007).

Concern over mistakes was also found to impact upon performance cognitive anxiety, which confirms previous work (Eum and Rice, 2011; Kobori et al., 2011). The link between concern over mistakes and depressive and anxiety symptoms has been previously reported (Jain and Sudhir, 2010; Juster et al., 1996, respectively). The study found that performance cognitive anxiety mediates the relationship between CM and depression suggesting that targeting concern over mistakes or performance cognitive anxiety may reduce depressive symptomatology in dancers.

The finding of our study are supported by Wade et al. (2008) and Shafran et al. (2006) who suggest that high personal standards and not CM, can predispose healthy individuals to dieting. However, dieting within dance settings might not always be associated to ED risk factors. The fact that dancers control their food intake does not necessarily mean that they are at risk of developing an eating disorder. As it can be concluded from the model, there are dancers who restrict their food because they consider that thinness is the aesthetic ideal to succeed in their career (Homan, 2010).

Although the present study has several innovative aspects, there are some limitations that need to be considered. The main limitation is the use of general questionnaires such as the BDI II (Beck, Steer and Brown, 1996) or EAT- 26 (Garner, Olmsted, Bohr and Garfinkel, 1982) which are not validated specifically to be used within the dance population, although they are validated and highly reliable measurements. Another limitation is that performance anxiety was measured hypothetically and it will be best to measure it previous to an event, which due to the methodology of our current study this was not possible. Moreover, performance anxiety has been retrospectively measured instead of administering the questionnaires in situ before the performance.

Based on the present study's, future research should replicate this study and include males, different age range, dance levels and nationalities.

The present study has several implications for the ED prevention in dance settings. As in Stice and Shaw (2002) work, our results suggest that prevention of eating disorders in dancers might be enhanced not only by focusing in reducing levels of perfectionism but by giving greater attention to body image disturbances. Body image has been found, not only to be a risk factor for the development of an eating disorder per se, but as a mediator between perfectionism (CM) and dieting, and associated to performance cognitive anxiety which mediates the relationship between perfectionism and depression. The study also shows that prevention of eating disorders among dancers may required less of a focus on dieting, which it is likely to be common among female dancers, and more in reducing specific parts of the individuals personality, concerns over mistakes. This is easier said than done as concerns over mistakes is likely to be strongly associated to self-esteem (Neumark-Sztainer et al., 2006; Stice, 1997), which has been associated to poor outcome. Improving self-esteem is known to be difficult, possibly due to the complex etiology where past events, attachment and relationship with parents play a fundamental part. Interventions aiming at reducing CM may required a preventative component and by doing so it will help reducing body dissatisfaction, performance cognitive anxiety and dieting which will prevent the development of eating disorders in this vulnerable group.

#### INFLUENCIA DEL PERFECCIONISMO EN VARIABLES RELACIONADAS CON TRASTORNOS ALIMENTARIOS EN ESTUDIANTES DE DANZA

**PALABRAS CLAVE:** Preocupación ante los Errores, Exigencias Personales, Insatisfacción Corporal, Ansiedad de Rendimiento, Depresión, Dieta, Perfeccionismo Debilitador.

**RESUMEN:** El objetivo del presente estudio fue examinar la influencia de los dos elementos principales del perfeccionismo (CM, preocupación ante los errores y PS, exigencias personales) ante los factores de riesgo de los trastornos alimentarios en bailarinas. Con apoyo en la literatura, evaluamos el rol de CM y de PS sobre la dieta y el estado de ánimo, y la función de la ansiedad de rendimiento y la insatisfacción corporal como los principales mediadores en el modelo. Doscientos ocho bailarinas ( $M = 15.28$ ,  $DE_{edad} = 2.32$ ) de dos conservatorios de danza españoles participaron en este estudio. Gracias a modelos estructurales, los resultados confirman la influencia de PS y de CM en la dieta, sin embargo la vinculación entre dieta, insatisfacción corporal, estado de ánimo y la ansiedad de rendimiento solo se produce a partir del CM que es la vía del perfeccionismo debilitador. En conclusión, la presencia de CM puede ser la clave para diferenciar entre bailarines con mayor riesgo para desarrollar trastornos alimentarios debido a su asociación con variables tradicionalmente relacionadas con estos.

# INFLUÊNCIA DO PERFECCIONISMO NAS VARIÁVEIS ASSOCIADAS AOS TRANSTORNOS ALIMENTARES EM ESTUDANTES DE DANÇA

**PALAVRAS-CHAVE:** Preocupação face aos erros, Exigências pessoais, Insatisfação corporal, Ansiedade face ao rendimento, Depressão, Dieta, Perfeccionismo debilitador.

**RESUMO:** O objectivo do presente estudo foi analisar a influência dos dois principais elementos do perfeccionismo (CM, preocupação face aos erros e PS, exigências pessoais) face aos factores de risco dos transtornos alimentares em bailarinas. Com suporte na literatura, avaliamos o papel de CM e PS sobre a dieta e o estado de humor, e a função da ansiedade relativa ao rendimento e a insatisfação corporal como os principais mediadores do modelo. Participaram no estudo duzentas e oito bailarinas ( $M = 15.28$ ,  $DP_{idade} = 2.32$ ) de dois conservatórios de dança espanhóis. Através de modelos estruturais, os resultados confirmam a influência de PS e de CM na dieta, contudo a relação entre dieta, insatisfação corporal, estado de humor e ansiedade relativa ao rendimento apenas é predita através de CM que é a via do perfeccionismo debilitador. Em conclusão, a presença de CM pode ser a chave para diferenciar os bailarinos com maior risco de desenvolverem transtornos alimentares devido à sua associação com variáveis tradicionalmente relacionadas com estes.

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