

EATING BEHAVIOR AND PERSONOLOGICAL FEATURES OF AN ITALIAN SAMPLE OF UNIVERSITY STUDENTS: A PILOT STUDY

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Abstract

This study aims to evaluate the personality features that seem to be predictor of eating disorders in relation to perceived levels of self-esteem, self-efficacy and concern about their physical appearance, in a sample consisting of 90 students, aged 19 to 23, attending three different study courses of the University of Catania: Medicine, Psychology and Motor Science. The following psychological tests were used: Eating Disorder Inventory-2; Body Shape Questionnaire; Generalized Self-Efficacy Scale; Self-Esteem Scale. Data analysis shows that Psychology-group seems to orientate its interest and concerns toward individual and social skills and to use the ability to recognize and respond accurately to emotional states. Motor Science-group seems to direct their attention mainly toward body aspects; moreover, it seems to be characterized by a high sense of perceived self-efficacy and self-esteem. Finally, the characterizing factor for Medicine-group seems to be self-esteem, where subjects show highest scores, confirming the protective role of this domain. In Conclusion, the three groups seem to possess different qualities and abilities that reflect to some extent the personal choice to undertaken a particular path of study; this would seem to have a close relationship with the type of eating behavior that each individual performs in his daily life.

Keywords: eating disorders; personality; body shape; self-efficacy; self-esteem

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Introduction

Anorexia, bulimia and obesity seem to have become the disturbances of our time. The problem of eating disorders is becoming more and more urgent every day: mass media are devoting ever-wider spaces, while therapists and hospitals have to deal with a growing number of cases.

Scientific literature dealing with eating disorders and related disorders has produced a lot of work, with exponential growth especially in the last twenty years.

It has been found that eating disorders can be derived from both genetic predisposition, suggested by observation that certain traits of personality "run in families" (Klump, Miller, Keel, McGue, & Iacono, 2001; Wade, Martin, Tiggemann, Abraham, Treloar, & Heath, 2000), such as low self-esteem (Mendelson, McLaren, Gauvin, & Steiger, 2002) or perfectionism (Halmi et al., 2000; Bulik, Tozzi, Anderson, Mazzeo, Aggen, & Sullivan, 2003), and environmental risk factors, some of which concern adverse experiences before the onset of such disorders, similarly to other mental disorders, such as sexual abuse or abandonment (Neumark-Sztainer, Story, Hannan, Beuhring, & Resnick, 2000; Molinari, 2001). Prospective meta-analysis studies state that perfectionism, in particular, would seem to be a risk and maintenance factor for bulimia disease and for eating disorder (Fairburn, 1997); in fact, perfectionism could make individuals vulnerable to episodes of uncontrollable binge eating (Hawkins & Clement, 1984). There is no specific cause to explain the nature and the onset of an eating behavior disorder; in order to explain the onset, all researchers agree that it is necessary to use a "multifactorial" point of view, that is, looking for a set of factors that contribute to the onset and the maintenance of the disorder. Predisposing factors that, if present, could influence eating behavior seem to be individual, family, environmental and sociocultural factors (Wardle, Robb, & Johnson, 2002; Young-Hyman, Schlundt, Herman-Wenderoth, & Bozylinski, 2003). It has been found that there are many common traits among anorexia, bulimia and obesity problems (Bulik, Sullivan, Carter, & Joyce, 1997; Mussell, Mitchell, Fenna, Crosby, Miller, & Hoberman, 1997; Cristofanelli & Ferro, 2012); for example, the body image disturbance is present in each eating disorders sub-type, as well as the impulsivity traits or the lack of self-esteem, though with different characteristics (Wang & Borders,

2018, Wardle, Waller, & Rapoport, 2001; Braet, Claus, Verbeken, & van Vlierberghe, 2007).

Regarding what has been stated there are many theory-frames highlighting that subjects with eating disorders manifest feelings of inadequacy and incompetence. In particular, Hilde Bruch (1973) pointed up an interesting psychological characteristic of such subjects: a paralyzing sense of "ineffectiveness" pervading all thought and every activity of the person.

Starting from the ideas of Hilde Bruch (1973) and on the basis of scientific literature (Bell et al., 2000; Decaluwé & Braet, 2005; Vandereycken, 1993; Fairburn, Cooper, & Shafran, 2003; Vitousek & Hollon, 1990), it is possible to state that subjects with eating disorders (anorexia, bulimia and obesity) have a common feature: a self-esteem deficit. Self-esteem corresponds to the opinion that the individual has of himself, on the basis of his own experiences, that also includes how they have been evaluated by others. It should also be pointed out that people with eating disorders tend to evaluate themselves within the confines of their body shape and weight (Fairburn, 1997, 2003). The perception that the person has of their appearance, or the way in which in his mind was formed the idea of his body and its forms, seem to affect his life more than its real image.

Objectives

One of the objectives of our pilot study was to evaluate the personality features that seem to be predictor of eating disorders in a group of university students pertaining to three different degree programs: Medicine, Psychology and Motor Science; subsequently, these personological characteristics were correlated with the perceived levels of self-esteem, self-efficacy and concern about their physical appearance.

Moreover, our work aimed to investigate the existence of a possible difference between the groups, in order to understanding whether choosing to take different study paths, now oriented to the body now on the mind, may be indicative of inter-individual differences in terms of personal predispositions in relation to the psychological characteristics studied.

Method

Participants

The sample consists of 90 students, 34 males and 56 females, aged 19 to 23, attending the second year of three different study courses of the University of Catania: Medicine (MD), Psychology (PSY) and Motor Science (MS). Specifically, the sample consists of 30 subjects attending the MD, with an average age of 21.33 years (± 1.29 Standard Deviation, SD), 30 subjects attending PSY with an average age of 20 years (± 0.69 SD), and finally, 30 subjects attending the third year of the MS with an average age of 21.73 years (± 2.11 SD). The subjects were fully informed about the purpose of the study and signed an informed consent prepared according to the ethical standards laid down in the Declaration of Helsinki (revision 2013).

Procedures

To carry out the present study, the following psychological assessment tests were used:

Eating Disorder Inventory - Italian version 2 (EDI-2), originally developed by Garner, Olmstead and Polivy in 1983, that provides a measure of psychological and behavioral features associated with DCAs. The questionnaire consists of 91 items, of which the first 64 form the 8 primary scales: 1. Drive for Thinness (DT); 2. Bulimia (BU); 3. Body Dissatisfaction (BD); 4. Ineffectiveness (IN); 5. Perfectionism (PE); 6. Interpersonal Distrust (ID); 7. Interoceptive Awareness (IA); 8. Maturity Fears (MF). The remaining 27 items form the three additional scales: 1. Asceticism (ASC): a tendency to seek value through the pursuit of spiritual ideals such as self-discipline, self-regulation, self-limitation and sacrifice; 2. Impulse Regulation (IR): the tendency to prudence, substance abuse and hostility; 3. Social Insecurity (SI): it measures the degree of conviction with respect to the fact that social relationships are difficult.

Body Shape Questionnaire - Italian version (BSQ), originally developed by Cooper, Taylor, Cooper and Fairburn in 1987, that investigates concerns about their physical fitness. It is based on the concept that body image disorders are a central element in the development of anorexia or bulimia disorder. It consists of 34 items.

Generalized Self-Efficacy Scale - Italian version (GSES), originally developed by Schwarzer and Jerusalem (1995), that assesses the perceived self-

efficacy, with the aim of predicting the coping strategies used to deal with and adapt to various stressful life events. It consists of 10 items.

Self-Esteem Scale - Italian version (SES), originally developed by Nathaniel Branden in 1994, that investigates the degree of self-esteem perceived by the subject. It consists of 50 items.

Statistical analysis

Data was collected and averaged, and then compared by using one-way repeated measures analysis of variance (ANOVA; Friedman test), followed by post-hoc Dunn's Multiple Comparison Test; moreover, the effect size index (Cohen's *d* value) was calculated. The relationship between variables was analyzed with linear regression. Significance was set at $p < .05$. All analyses were performed by means of using GraphPad Prism version 6.03 for Windows (GraphPad Software, San Diego, CA, USA).

Results

The mean and standard deviations obtained from the scores of tests are shown in Table 1, whereas possible correlations between dimensions of EDI-2, BSQ, GSES and SES are shown in Table 2.

Table 1. Means and Standard Deviations (SD) of EDI-2 dimensions, BSQ, GSES and SES

TEST	MD		PSY		MS	
	Means	± SD	Means	± SD	Means	± SD
<i>DT</i>	44,7	25,3	47,3	22,5	36,0	15,0
<i>BU</i>	56,0	16,0	57,8	24,9	52,9	17,4
<i>BD</i>	31,0	21,8	39,1	22,7	18,0	16,0
<i>IN</i>	47,0	24,4	64,3	26,4	42,9	21,7
<i>PE</i>	76,1	21,3	66,0	21,9	67,2	24,2
<i>ID</i>	57,6	22,8	57,6	29,6	47,0	17,8
<i>IA</i>	42,0	29,4	59,7	23,1	35,3	22,8
<i>MF</i>	52,5	30,1	55,0	31,4	45,1	25,0
<i>ASC</i>	41,5	31,2	42,1	26,6	30,0	19,0
<i>IR</i>	52,2	27,0	51,1	26,4	33,8	18,5
<i>SI</i>	38,6	26,2	57,3	31,4	42,0	26,0
<i>BSQ</i>	77,8	39,1	93,1	41,0	62,2	22,2
<i>GSES</i>	187,5	17,7	167,7	24,2	180,0	19,5
<i>SES</i>	29,7	4,6	26,5	4,4	29,7	4,0

Note: *DT*=Drive for Thinness; *BU*=Bulimia; *BD*=Body Dissatisfaction; *IN*=Ineffectiveness; *PE*=Perfectionism; *ID*=Interpersonal Distrust; *IA*=Interoceptive Awareness; *MF*=Maturity Fears; *ASC*=Asceticism; *IR*=Impulse Regulation; *SI*= Social Insecurity; *EDI-2*=Eating Disorder Inventory-2; *BSQ*=Body Shape Questionnaire; *SES*=Self-Esteem Scale; *GSES*=Generalized Self-Efficacy Scale. Samples: *MD*=Medicine ; *PSY*=Psychology ; *MS*=Motor Science.

Table 2. Correlations between EDI-2 dimensions, BSQ, GSES, and SES

TEST	BSQ			GSES			SES		
	MD	PSY	MS	MD	PSY	MS	MD	PSY	MS
<i>DT</i>	***	***	*	n.s.	n.s.	n.s.	**	n.s.	n.s.
<i>BU</i>	n.s.	n.s.	n.s.	n.s.	*	n.s.	*	n.s.	n.s.
<i>BD</i>	***	***	***	*	n.s.	n.s.	**	n.s.	*
<i>IN</i>	***	**	*	**	***	**	***	**	**
<i>PE</i>	n.s.	n.s.	n.s.	n.s.	n.s.	*	n.s.	n.s.	n.s.
<i>ID</i>	*	n.s.	n.s.	**	n.s.	n.s.	n.s.	*	n.s.
<i>IA</i>	***	**	n.s.	*	**	n.s.	*	n.s.	n.s.
<i>MF</i>	*	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
<i>ASC</i>	***	**	n.s.	n.s.	n.s.	n.s.	*	n.s.	n.s.
<i>IR</i>	*	n. s.	n.s.	n.s.	**	n.s.	n.s.	n.s.	n.s.
<i>SI</i>	n.s.	n. s.	*	n.s.	***	n.s.	n.s.	**	n.s.
BSQ	-	-	-	n.s.	*	n.s.	**	n. s.	***
GSES	n. s.	*	n.s.	-	-	-	**	***	*
SES	**	n.s.	***	**	***	*	-	-	-

Note: *DT*=Drive for Thinness; *BU*=Bulimia; *BD*=Body Dissatisfaction; *IN*=Ineffectiveness; *PE*=Perfectionism; *ID*=Interpersonal Distrust; *IA*=Interoceptive Awareness; *MF*=Maturity Fears; *ASC*=Asceticism; *IR*=Impulse Regulation; *SI*=Social Insecurity; *EDI-2*=Eating Disorder Inventory-2; *BSQ*=Body Shape Questionnaire; *SES*=Self-Esteem Scale; *GSES*=Generalized Self-Efficacy Scale. Samples: MD=Medicine; PSY=Psychology; MS=Motor Science. Significance: n.s.= not significant; *p<.05, low significant; **p<.01, moderate significant; ***p<.001, high significant.

In particular, the EDI-2's Interoceptive Awareness dimension (IA) correlates positively with BSQ ($r^2=.5209$; $p<.0001$ ***), GSES ($r^2=.1441$; $p<.0385$ *) and SES ($r^2=.1405$; $p<.041$ *) in the Medicine group (MD), while it correlates significantly only in relation to BSQ ($r^2=.2494$; $p<.005$ ***) and GSES ($r^2=.1472$; $p<.005$ **) in the Psychology group (PSY); these correlations are completely absent in the Motor Science group (MS). Another significant positive correlation is found between SI (Social Insecurity, EDI-2) and BSQ ($r^2=.1385$; $p<.042$ *) in the MS group, while SI correlates negatively with GSES ($r^2=.2070$; $p<.0008$ ***) and SES ($r^2=.3240$; $p<.001$ **) in the PSY group; these correlations are completely absent in the MD group. Moreover, SES values correlates negatively with BSQ in both MS ($r^2=.5289$; $p<.0001$ ***) and MD groups ($r^2=.2442$; $p<.005$ **), while this correlation is totally absent in PSY group.

In addition, the BD (Body Dissatisfaction, EDI-2) dimension correlates negatively in the MD group both with GSES ($r^2=.1428$; $p<.039$ *) and SES ($r^2=.2529$; $p<.004$ **), while the same correlation only with SES ($r^2=.1324$; $p<.048$ *) is found in the MS group; these correlations are completely absent in

the PSY group. Moreover, another interesting negative correlation between DT (Drive for Thinness) and SES ($r^2=.2516$; $p<.004^{**}$) emerged in the MD group.

Finally, a comparison of the test scores between the samples was carried out and the results, accompanied by the values of Cohen's *d* index, are shown in Table 3.

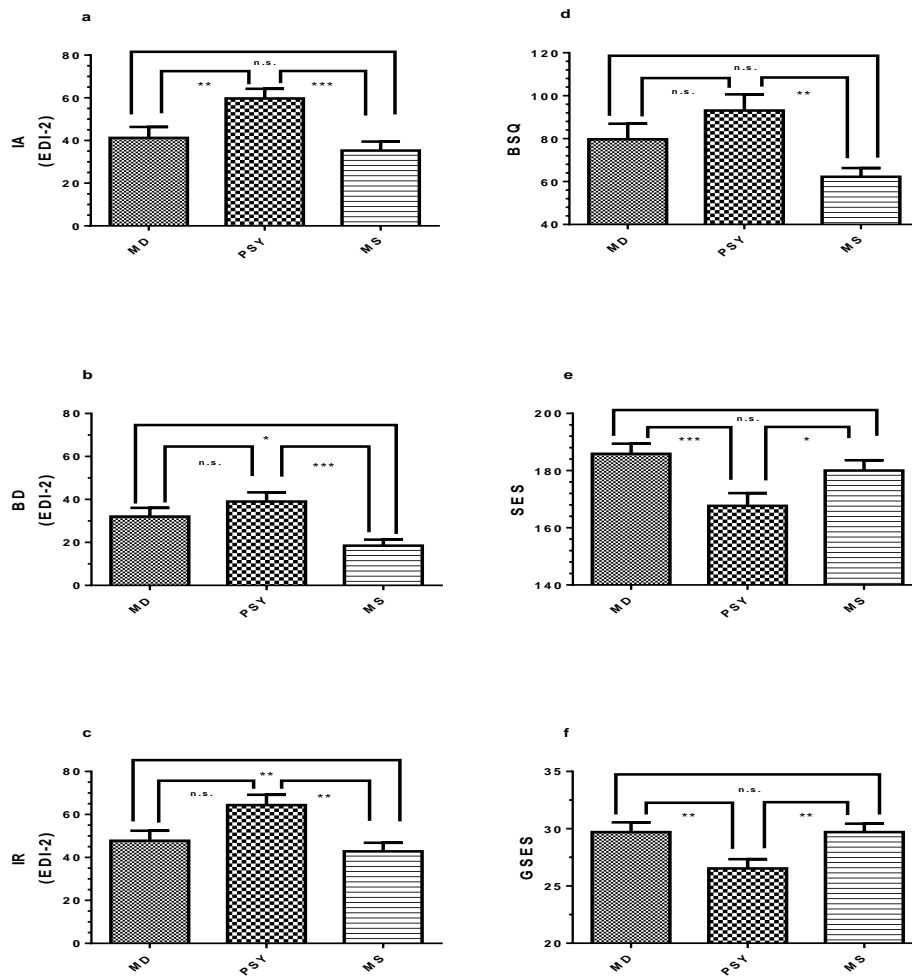
Table 3. Comparison of EDI-2, BSQ, GSES and SES means between Medicine, Psychology and Motor Science students

TESTS	EDI-2											BSQ	GSES	SES	
	DT	BU	BD	IN	PE	ID	IA	MF	ASC	IR	SI				
SAMPLES	MD-PSY	n.s.	n.s.	n.s.	.0150 *	n.s.	n.s.	.0094 **	n.s.	n.s.	n.s.	.0324 *	n.s.	.0043 **	.0006 ***
	Cohen's <i>d</i>	-	-	-	.68	-	-	.70	-	-	-	.64	-	.93	.71
	PSY-MS	.0493 *	n.s.	.0001 ***	.0018 **	n.s.	n.s.	.0004 ***	n.s.	n.s.	.0014 **	.0310 *	.0037 **	.0065 **	.0405 *
	Cohen's <i>d</i>	.60	-	.07 *	.88	-	-	1.06	-	-	.76 *	.53	.93	.56	.76
	MD-MS	n.s.	n.s.	.0101 *	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	.0048 **	n.s.	n.s.	n.s.	n.s.
	Cohen's <i>d</i>	-	-	.68	-	-	-	-	-	-	.80	-	-	-	-

Note: DT=Drive for Thinness; BU=Bulimia; BD=Body Dissatisfaction; IN=Ineffectiveness; PE=Perfectionism; ID=Interpersonal Distrust; IA=Interceptive Awareness; MF=Maturity Fears; ASC=Asceticism; IR=Impulse Regulation; SI= Social Insecurity; EDI-2=Eating Disorder Inventory-2; BSQ=Body Shape Questionnaire; SES=Self-Esteem Scale; GSES=Generalized Self-Efficacy Scale. Samples: MD=Medicine; PSY=Psychology; MS=Motor Science.

Significance (*t*-test): n.s.=not significant; * $p<.05$, low significant; ** $p<.01$, moderate significant; *** $p<.001$, high significant. Cohen's effect size (*d*): $d=0.2$, small effect size; $d=0.5$, medium effect size; $d\geq 0.8$ large effect size.

The mean values obtained by the PSY group in the IN (Ineffectiveness) and SI (Social Insecurity) dimensions of EDI-2 are significantly higher than MD and MS groups. As illustrated in Figure 1, another interesting difference concerns the BD (Body Dissatisfaction) dimension (Fig. 1-b), which has lower mean values in the MS group than other two groups. The same data emerges in relation to the IR (Impulse Regulation) dimension (Fig. 1-c). In addition, EDI-2's Interceptive Awareness (IA) dimension is significantly different in the comparison between the PSY group, that shows the highest values, and the other two groups (Fig. 1-a). Moreover, the values of BSQ differ significantly between the PSY group and MS group (Fig. 1-d): the BSQ mean values are lower in PSY group than others two groups. Finally, the mean values of GSES (Fig. 1-f) and SES (Fig. 1-e) differ significantly between the PSY group and both MD and MS groups; in particular, the mean values of both scales are lower in the PSY group than others, while no significant difference between MS and MD groups was found.



Note: IA=Interoceptive Awareness; BD=Body Dissatisfaction; IR=Impulse Regulation; SI=Social Insecurity; EDI-2=Eating Disorder Inventory-2; BSQ=Body Shape Questionnaire; SES=Self-Esteem Scale; GSES=Generalized Self-Efficacy Scale.

Samples: MD=Medicine; PSY=Psychology; MS=Motor Science.

Significance: n.s.=not significant; *p<.05 low significant; **p<.01 moderate significant; ***p<.001 high significant.

Figure 1. Comparison between MD, PSY and MS groups, related to EDI-2's factor (a) IA, (b) BD, (c) IR, and (d) BSQ, (e) SES, (f) GSES.

Discussion

Based on the results obtained by data analysis it is possible to state that the three groups of university students have different characteristics.

First of all, the PSY group members seem to orient their interests and concerns on the basis of individual and social skills; in particular, this group appears to be negatively affected by feelings of social insecurity and inadequacy, and also it reveals significantly lower mean values in relation to the sense of self-efficacy and perceived self-esteem. Specifically, self-efficacy appears to be the aspect that most influences the other psychological factors of this group, such as propensity to bulimic behavior, impulsivity, social insecurity, and concern for the body's own appearance. For the above, it is clear that the perceived self-efficacy is probably configured as a weakness characterizing the PSY group, especially in relation to the factors that may be predictive of more or less appropriate eating behavior (Peckmezian & Hay, 2017). Conversely, the PSY group seems to be positively characterized by the ability to recognize and respond accurately to emotional states: by obtaining higher values in interoceptive awareness (IA) scores than the other two groups, this factor seems to be the only one able to modulate the concern for one's own body (BSQ) and, in particular, the sense of self-efficacy (GSES); therefore, we hypothesize that this factor could prove to be a positive resource in relation to those factors that seem able to influence eating behavior.

Concerning the MS group, the data show that subjects belonging to this group seems to focus their attention more on the bodily than on the cognitive-emotional side, contrary to the PSY group's findings, coherently with the typology of study undertaken. Consistent with this possibility, MS group shows lower mean values in relation to the BD (Body Dissatisfaction, EDI-2) and BSQ scores than the other groups; moreover, the attention toward one's own body seems to directly linked with self-esteem perceived levels. These evidences suggest that this group appears to have an actual interest in the care of their own body. Another important evidence in relation to factors that seem to promote the development and maintenance of possible eating disorders relates to the impulsivity dimension (IR, EDI-2) (Braet et al., 2007; Kessler, Hutson, Herman, & Potenza, 2016), which shows significantly lower mean values in the MS group than the other two groups; as it can be seen from literature (Wang & Borders, 2018), it could represent a protective factor for

such disorders. In addition, as well as the MD group (see below), the MS group appears to be characterized by a high sense of perceived self-efficacy and self-esteem (Mendelson et al., 2002); even in this case, we hypothesize that such dimensions could be good predictors for a more appropriate eating behavior.

Finally, the characterizing factor for MD group seems to be self-esteem, where subjects show the highest scores along with the MS group. The sense of self-esteem perceived in the MD group presents the greatest number of correlations with some of the factors that may be predictive of a more or less appropriate eating behavior (Braun, Park, & Gorin, 2016), i.e. the drive for thinness (DT) and propensity to bulimic behavior (BU); moreover, it seems to have a modulating effect in relation to concern for one's own body. Hence, adequate levels of self-esteem seem to play a positive role in eating behavior in this group. Finally, as well as for the PSY group, it is possible applies the same logic related to interoceptive awareness (IA) even for the MD group, in terms of positive resource related to concerns about their own body and the way of perceiving themselves.

In sum, the PSY group seems to orientate its interest and concerns toward individual and social skills and to use the ability to recognize and respond accurately to emotional states as a positive resource in relation to those factors that seem to be able to influence eating behavior.

Instead, the subjects belonging to MS group seem to direct their attention mainly toward body aspects; moreover, they seems to be characterized by a high sense of self-efficacy and self-esteem perceived. These dimensions seem to promote appropriate eating behavior.

Finally, the MD group is halfway between other two groups. Indeed, their attention is directed to both the bodily and cognitive-emotional side, without the one prevailing over the other; they seem to be able to cope with those risk factors associated with bad eating behaviors by interoceptive awareness, the strongpoint of the PSY group, and by self-esteem which is a positive resource for the MS group, as well as self-efficacy.

Conclusion

Results from this study suggest that the features of the individual groups reflect to some extent the personal choice to undertaken a path of study rather than the other; it seems to indicate specific personological dispositions in the

way subjects perceive themselves and their own body. Ultimately, these individual perceptions strongly influence the type of eating behavior that each individual performs in their daily life, or at least provide some useful elements for understanding the key factors that can lead to the establishment of an eating behavior disorder.

We remind the reader that the obtained results are only preliminary and further research is required in order to investigate how and what extent the choice to undertake a kind of training path could influence or reflect the beliefs of the subjects in relation to the own person, with the aim of drawing up prevention programs for eating disorders the most adherent as possible to the needs of each individual, by setting up intervention groups as homogeneous as possible. Moreover, given the limited nature of the sample and the relative context of belonging, it would be desirable to extend our investigation to a broader socio-cultural context and, therefore, more representative of the object of this study. Although these limitations, the present research provides many suggestions for future studies. First, the role of stress on eating behavior, since cortisol is capable of activating processes related to the physiologic defense systems (Di Corrado, Agostini, Bonifazi, & Perciavalle, 2014). A second aspect is represented by the anthropometric characteristics of participants, such as 2D:4D ratio, variables that have been observed as able to influence several human performances and behaviors (Di Corrado & Perciavalle, 2013; Coco, Perciavalle, Maci, Nicoletti, Di Corrado, & Perciavalle, 2011; Perciavalle, Di Corrado, Petralia, Gurrisi, Massimino, & Coco, 2013; Perciavalle, Di Corrado, Scuto, Perciavalle, & Coco, 2014; Massimino et al., 2018).

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