Relationship between eating and social behaviours in a normal population

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Abstract

The present study investigated the range of eating attitudes and social adjustment abilities of a normal population in relation to BMI, age and gender. The study consisted of 482 university and secondary education students ranging from 12 to 45 years of age (mean 20.57 ± 5.03 years). Mean B-WISE scale and EAT-26 subscale scores were compared among age, BMI and gender subgroups. Results revealed that adolescents and individuals deviating from a healthy BMI were more apt to adopt disordered eating behaviour patterns. BMI, age and gender were related to specific eating attitude sub factors; according to ANOVA results, significant differences were established a) for the "oral control" subscale among age, gender and BMI, and b) for the "dieting" subscale among gender and BMI. The psychosocial impact of weight was a significant predictor of dieting and bulimic behaviour. According to the results, there is a wide range of eating attitudes in the normal population, whereas traditionally, groups more sensitive to disordered eating patterns could be defined. With regard to psychosocial adjustment abilities, adolescents and males were revealed to be adopting more high-risk social behaviour associated with eating disorders. Finally, it was observed that the more extreme the eating behaviour the weaker the core and stability among the normal population; consequently the stronger the mobility between the normal and disordered population. Adoption of healthy lifestyle patterns that provide positive body image, weight satisfaction and healthy eating behaviour, are recommended.

Keywords: eating disorders; social adjustment; self-image; university; secondary.

Article citation: Kavazidou, E., Proios, M., Liolios, G., Nimatoudis, I., Tsatsoulis, A. Fachantidou-Tsiligiroglou, A. & Doganis, G. (2012) Relationship between eating and social behaviours in a normal population. *Graduate Journal of Sport, Exercise & Physical Education Research*, 1: 31-46.

INTRODUCTION

The multidimensional character of eating behaviour (EB) has been of increased interest to academic research in the last decade. Special emphasis has been placed on investigating the ways in which eating patterns relate to temperament (MacLaren and Best, 2009; Hartmann et al., 2010), physical appearance (Stein and Corte, 2003; Stein and Corte, 2008), quality of life (Banaś et al., 2002), demographic factors

(Doyen and Asch, 2008; Ervin, 2008) and socio-cultural conditions (Bachner-Melman et al., 2009; Moschonis et al., 2010); or even how and why eating patterns affect, or are affected by, specific biological and genetic factors, such as, circadian rhythms (Froy and Miskin, 2010) and gene expression (Gallou-Kabani et al., 2010; Scherag et al., 2010). Eating behaviour concerns healthy eating, which refers to nutrient balance, regularity of snacks and meals and in-between mealtime consumption. Normal eating behaviour is pleasurable and flexible and ranges according to hunger and satiety signals, feelings, schedule, social needs and cultural background (Apfeldorfer, 1997; Franzini Pereira and Alvarenga, 2007). Disordered eating behaviour (DEB) refers to the full spectrum of problems related to eating (Franzini Pereira and Alvarenga, 2007). Disordered eating processes are difficult to identify and describe (Hetherington, 1993). Disordered eating behaviour symptoms concern food compulsions and restraints, nutrient deficiencies and deviations from normal BMI as a response to inadequate approaches to weight control (Hetherington, 1993; Apfeldorfer, 1997; Franzini Pereira and Alvarenga, 2007). Eating behaviour reflects the individual's cultural identity as well as its wider social context, it is also closely related to specific psychosocial skills, such as self-image, self-concept, self-esteem and self-confidence (Stein and Corte, 2003; Stein and Corte, 2008; Castrogiovanni et al., 2009). Disordered eating behaviour is often related to difficulties in psychosocial adjustment (Goldschmidt et al., 2010; Peñas-Lledó et al., 2010; Turner et al., 2010).

Eating disorders (ED) are considered as mental disorders and concern sustained DEB (Hetherington, 1993; Franzini Pereira and Alvarenga, 2007; Walsch, 2011). Indicators of ED can be biologic, mental, psychological, environmental and socio-cultural (Stacher, 1999). Eating disorder syndromes can be further classified according to the set of symptoms (Walsch, 2011) into: a) anorexia nervosa, which is characterized by food restriction and significant weight loss, b) bulimia nervosa, characterized by binge-purge cycles, c) DEB characterized by extreme overeating without purging and d) Eating Disorders Not Otherwise Specified characterized by various and sustained disordered eating matrixes not otherwise specified (Pratt and Woolfenden, 2002; Thomas et al., 2009). A population with normal weight, unrestrained eating attitudes and absence of ED history is considered as clinically normal (Hetherington, 1993).

Eating behaviour can be largely outlined by studying eating attitudes which have been established as a highly reliable predictor of EB (Jacobs et al., 2011). According to Túry et al. (2010), reliable self-rate screening tools for recording eating attitudes and acknowledging the symptoms of EDs in clinical practice and research are EAT-26 (26-item ED screening test) BULIT (36-item Bulimic Test), BITE (33-item Bulimia Investigatory Test Edinburgh), SCOFF (5-item Anorexia Nervosa (AN) & Bulimia Nervosa (BN) screening test) and SEED (6-item Short Evaluation of EDs). The Eating Attitudes Test (EAT-26) is the most widely used screening test of ED (Orbitello et al., 2006). Its final form was proposed by Garner et al. (1982) and consists of 26 items; the variables estimated by the questionnaire are: dieting, bulimia and oral control.

This questionnaire has been translated into several languages and validated in many countries and still constitutes a contemporary, reliable instrument of acknowledging the symptoms of EDs (Orbitello et al., 2006; Rivas et al., 2010). Its use is combined

with the measurement and calculation of a person's BMI, as these two factors have been found to be closely related (Garner et al., 1982; Costarelli et al., 2009; Koskina and Giovazolias, 2010). When the questionnaire values are above 20, the more likely it is for the BMI to deviate from the normal expected standards (Larrañaga Vidal and García-Mayor, 2009).

People suffering from EDs tend to exhibit specific problems in their social behaviour, such as psychosocial adjustment difficulties due to their distorted body image or low emotional intelligence in comparison with the normal population (Costarelli et al., 2009; Filaire et al., 2011; Zysberg and Rubanov, 2010). Body image disturbances, a common feature of EDs, dramatically influence the quality of life and successful social interrelation (Túry et al., 2010; Lillis et al., 2011). The "drive for thinness" desire is usually stimulated by social acceptance needs (Lillis et al., 2011). People with body image disorder and emotional disturbances cannot effectively and successfully handle their interpersonal and social relations (Costarelli et al., 2009; Zysberg and Rubanov, 2010); the main symptoms being their inability to cope with and control their feelings, to anticipate several intrapersonal, interpersonal or social situations, in addition to low self-assertion. Such psychosocial difficulties negatively affect self-concept, self- confidence and self-esteem (Leon et al., 1993; Costarelli et al., 2009; Zysberg and Rubanov, 2010).

Reliable and frequently used self-reported instruments for assessment of body image in combination with ED screening and diagnostic tools are the BSQ (34-item Body Shape Questionnaire), the PASTAS (Physical Appearance State and Trait Anxiety Scale) the SATAQ-3 (30-item Sociocultural Attitudes Towards Appearance Scale-3), the BAS (13-item Body Appreciation Scale) and the B-WISE (12-item Body Weight, Image and Self-Esteem scale) (Arbour-Nicitopoulos et al., 2010; Túry et al., 2010). B-WISE is the most recently designed tool for screening attitudes related to body image, body weight and eating limits (Awad and Voruganti, 2004; de Hert et al., 2006).

Eating behaviour is affected by demographic factors such as age and gender (Brandsma, 2007; Støving et al., 2011), and it has been found that EDs usually originate in adolescence (Brandsma, 2007; Doyen and Asch, 2008), with authors suggesting this may now be evident in childhood (Machado et al., 2007; Herpertz-Dahlmann et al., 2011). Adults mainly tend to adopt healthy eating patterns, diets and behaviour (Hetherington, 1994; Brandsma, 2007) whereas, among young adults and adolescents, EB often deviates from normal (Nelson et al., 2009; Manios et al., 2011; Sepulveda et al., 2010).

Gender-related differences used to be more extreme in females, who exhibited EDs more often than males; however, contemporary research has established that the percentage of males suffering from DEB has increased since the 1990s, although the range of its symptoms and syndromes is not as wide as that of females (Hepworth, 2010; Koskina and Giovazolias, 2010; Støving et al., 2011). The reasoning of an increased male population who are vulnerable to ED is related to sociocultural "fat phobia" and "emotional distress" factors (Simpson, 2002; Tomas et al., 2009; Lampard et al., 2011). An ED in a male population is more difficult to observe and define, as most available reference and psychometric tools concern mainly females (Støving et al., 2011). Males vulnerable to EDs (i.e. fat phobic, social

phobic, with anxiety disturbances or emotional dysregulation, adolescents, overweight and obese individuals) usually suffer bulimic episodes or addiction to physical appearance, strict diets and food supplements intake (Rolls et al., 1991; Kinzl et al., 1999; Lindeman and Stark, 2000; Guerdjikova et al., 2007; Elfhag and Morey, 2008; Isomaa et al., 2010; Parylak et al., 2011; Støving et al., 2011).

Disordered eating behaviour is usually weight related, where non-normative BMI and pathophysiology interfere with each other (Hetherington, 1993; Stacher, 1999; Grilo, 2006). Research in the field of weight and EDs has shown that BMI is positively related to DEB and psychosocial disabilities (Grilo, 2006; Gupta and Schork, 1993; Hetherington, 1994; Koskina and Giovazolias, 2010). The more the BMI deviates from normal (<18.5 - 25< according to the World Health Organization), the higher the probability of some form of ED, negative self-image, as well as extremely low self-confidence and self-esteem (Costarelli et al., 2009; Terracciano et al., 2009; Lillis et al., 2011). Individuals suffering from anorexia nervosa exhibit a low BMI, while those suffering from bulimia nervosa usually have low/ normal BMI (Golden et al., 2008; Butryn et al., 2010); individuals suffering from some EDNOS usually exhibit normal/ high BMI (Dunn et al., 2010), whereas those suffering from binge eating usually have high BMI (Guerdjikova et al., 2007; Kravarová et al., 2010).

A negatively BMI-affected behaviour is considered as a risk factor for eating, body image and weight related disorders (Grilo, 2006; Serdar et al., 2010), where young age groups and females are more vulnerable (Kotler et al., 2001; Pratt and Woolfenden, 2002; Chiriboga et al., 2008; Serdar et al., 2010).

AIMS

The purpose of the present study was to investigate the relationship between eating (dieting, oral control and bulimia) and social behaviour (psychosocial adjustment related to weight and body image) indexes in a normal population. A normal population was selected to examine the statement and range of normality considering that the transition between normal and disordered eating behaviour is stronger in a contemporary society. The psychosocial factor of “self-image” was chosen as it constitutes the common denominator of all types of EDs, regardless of pathology (DSM IV, American Psychiatric Association, 2000; Yager and O’Dea, 2008; Trujano Ruiz et al., 2010). Furthermore, all possible differentiations in the participants’ eating attitudes relating to age, BMI and gender were examined. More specifically, the relationship between EB and self-image was investigated, as reflected in the individual’s psychosocial adjustment (Awad and Voruganti, 2004; de Hert et al., 2006).

METHOD

Participants

In the present study, the participants were 500 university and secondary education students in Thessaloniki and Ioannina, 18 of whom failed to fill in the entire questionnaire, thus being excluded from the sample. The final sample consisted of 215 males and 248 females, whereas 19 participants did not specify any gender. Their age ranged from 12 to 45 years (M = 20.57, SD = 5.03). For participants under

16, their parental and school approval for participation was ensured. The variable "age" was further divided into three levels: adolescents 12-18, young adults 19-25 and adults 26-45 years of age (Koch and Pokorn, 1999; Vitello et al., 2011). The age groups were divided as detailed, while different social and EB were expected among adults and adolescents (Brandsma, 2007; Hetherington, 1994; Kirkcaldy et al. 2007; Strong et al., 2008). The participants' height and weight were two variables also taken into consideration as part of the demographic data, in order for the BMI to be calculated. These indices were further classified into several subcategories: a) underweight, b) normal, c) overweight and d) obese.

Stratified random sampling was applied. The participants were asked to fill in two questionnaires after which their height and weight were measured for the BMI calculation. This procedure took place in the classroom with their teachers' prior consent.

Eating Attitudes Test (EAT-26).
Eating attitudes were evaluated on the basis of the latest version of EAT-26 (Garner, 1982). Costarelli et al. (2011) reported a good Cronbach's alpha (α= .78), a high correlation between the subscales (.89) and a good construct validity (.66) for the Greek version of EAT-26. This questionnaire constitutes a widely used and flexible tool for screening disorder risks (dieting, bulimia and food preoccupation, and oral control), consists of 26 items and exhibits high reliability and validity (Lee et al., 2002). Answers are provided on a 6-item forced choice scale (1-*never* to 6-*always*). Each answer provides a score ranging from 0 to 3 after converting the 6-item Likert scale to units. Summing up the units of all 26 questions provides a final score ranging from 0 to 78. If the total score exceeds 20, counselling for EDs from a qualified healthcare professional, is recommended (Garner, 2004).

The EAT-26 test comprises 3 subscales: a) dieting, b) bulimia and food preoccupation, and c) oral control over food intake. The subscales have been designed to be evaluated together as it concerns the score, even though correlation matrixes between the subscales are often used if they meet satisfying reliability criteria. Each subscale provides a final score, ranging from 0 to 39 for the first (items 1, 6, 7, 10, 11, 12, 14, 16, 17, 22, 23, 24, 26), from 0 to 18 for the second (items 3, 4, 9, 18, 21, 25) and from 0 to 21 (items 2, 5, 8, 13, 15, 19, 20) for the third. TTO facilitate comparison, the scores for each subscale were transformed to a 0–100 scale [(raw score – lowest possible raw score)/possible raw score range) x 100], as suggested by de Lauzon et al. (2004).

B-WISE.
This is a self-reported questionnaire intended to evaluate the overall psychosocial impact of current weight and weight changes. It is weight sensitive and concerns subjective attitudes and responses related to body image, body weight and eating limits (de Hert et al., 2006). B-WISE has good internal consistency (Cronbach α = .79), split-half reliability (Spearman-Brown coefficient = .76) and test-retest reliability (.81) as reported by Awad and Voruganti (2004). The questionnaire consists of 12 items and is divided into 3 separate categories depending on score: severe, moderate and mild impact of weight on psychosocial adjustment (Awad and Voruganti, 2004; de Hert et al., 2006).

BMI calculation.
The Body Mass Index Calculation was based upon the BMI chart as suggested by the World Health Organization (1995, 2000, 2004). For participants under 18, an international cut-off points index, which meets differences across age and gender as proposed by Kuczmarski et al. (2002), was used.

Statistical Analysis
In the present study, descriptive statistics and preliminary analyses were conducted in order that the participants' eating attitudes and behaviour could be estimated. Simple correlations were employed to examine the relations between variables. Multivariate analyses were used to specify the extent of differentiations in eating attitudes across age, BMI and gender. Finally, regression analyses were conducted to estimate the relation between prediction and outcome variables. All analyses were performed using SPSS 15.0.

RESULTS

Descriptive Statistics
The results of descriptive statistics (total) shown in Table 1, indicate that all participants, with regard to their eating attitudes, report that they usually follow some diet, are compulsive eaters and exercise self-control over food intake. Moreover, they also admitted that the impact of society on their physical appearance is quite severe.

Table 1: Descriptive statistics for the EAT-26 scales and the B-WISE scale

Variables:	*M*	*SD*
Dieting	.56	.39
Bulimia	.48	.45
Oral	.41	.44
Behaviour	29.03	3.51

In the descriptive statistics framework (see Table 2), after investigating each independent variable separately, it has been established that, as regards "age", adults follow some diet more often than children and adolescents; children suffer from bulimia more often than adolescents and adults; and children seem to exercise self-control over food intake more often than adolescents and adults, while the social impact on EB seems to be more severe among adolescents, as compared to children and adults. Focusing on BMI, obese participants tend to follow weight loss diets compared with underweight, normal and overweight individuals; overweight participants tend to be compulsive eaters more often than normal, obese or underweight individuals; underweight participants seem to exercise better self-control over eating habits than overweight, normal or obese individuals. In addition, normal participants seem to be more concerned with the way society anticipates body image than underweight, overweight or obese individuals. Finally, descriptive statistics showed females to be more actively concerned with eating attitudes than males, who seem to be more interested in the social attitude towards body image. The significant differences observed between the above variables are presented in Table 2.

The correlation coefficients between age, BMI and gender and the subscales of EAT-26 were also investigated. The results of the analysis show low correlations of age with the subscale oral control (r = -.12, p < .05), of BMI with subscales dieting and oral control (r = .11, p < .05, r = -.13, p < .01, respectively), and finally, of gender with subscales dieting and oral control (r = .24, p < .01, r = .11, p < .05, respectively).

The EAT-26 indicated a satisfactory reliability level. The dieting subscale showed a satisfactory internal consistency (α = .75), whereas the bulimia and oral control subscales exhibited α = .60 and α = .62, respectively. These values can be considered acceptable as these factors resulted from only 10 items (Pallant, 2005). The B-WISE index, at α = .65, was not considered satisfactory.

Impact of Age, BMI and Gender in Eating Attitudes

Multivariate Analyses of Variances (MANOVAs) were used to establish any differences across the several levels of age, BMI and gender in a group of dependent variables (namely: dieting, bulimia and oral control). In the first MANOVA, age was used as an independent variable and a significant multivariate effect was established, Wilks' Lambda = .951, F (6,860) = 3.61, p < .01, η^2 = .03. According to Cohen (1988), the guidelines for the interpretation of such an "eta square" value (η^2) explain that the value .01 exhibits a low effect, value .06 exhibits a moderate effect, and value .14 a high effect. Therefore, the finding of η^2 = .03 maintains that the 3% of total variance in "eating attitude" variables is estimated across several age levels and can be classified as a moderate effect. The ANOVA that followed exhibited the different profile of the dependent variables. More specifically, significant differences were established only for the "oral control" subscale [F (2,435) = 6.20, p < .01, η^2 = .03]. Tukey *post hoc* comparisons (p < .05) were also included for the groups' profile of the dependent variable (see Table 1).

Table 2: Descriptive statistics (mean±SD) of the EAT-26 scales and the B-WISE scale for the age, BMI, gender, and of significant differences among of the variables.

		Eating (A)	Bulimia (B)	Oral (C)	Behaviour
Age	11-18 (1)	.57 ±.41	.52 ±.49	.50 ±.44[5]	29.01 ±3.73
	19-25 (2)	.53 ±.38[1]	.47 ±.43	.35 ±.43[7]	29.09 ±3.48
	26-45 (3)	.69 ±.46[1]	.35 ±.39	.42 ±.45	28.67 ±2.86
BMI	Underweight (a)	.64 ±.47[2]	.43 ±.41	.71 ±.47[6,7]	28.98 ±4.35
	Normal (b)	.51 ±.35[2,3]	.47 ±.44	.36 ±.41[6]	29.19 ±3.38
	Overweight (c)	.63 ±.44	.49 ±.50	.30 ±.44[5]	28.87 ±3.29
	Obese (d)	.88 ±.53[3]	.42 ±.42	.40 ±.41	27.00 ±3.64
Gender	Men (i)	.47 ±.35[4]	.46 ±.46	.35 ±.40[8]	29.41 ±3.46
	Women (ii)	.65 ±.43[4]	.48 ±.44	.44 ±.47[8]	28.43 ±3.53

Significant differences (*p < .05, **p < .001) between: [1]A2 < A3*; [2]Aa > Ab*; [3]Ab < Ad**; [4]Ai < Aii**; [5]C1 > C2**; [6]Ca > Cb**; [7]Ca > Cc**; [8]Ci< Cii*.

In the second MANOVA, BMI was used as an independent variable and a significant multivariate effect was established, Wilks' Lambda = .902, F (9,873) = 4.20, p < .001, η^2 = .03. The finding of η^2 = .03 maintains that the 3% of the total variance in "eating attitudes" variables (dieting, bulimia, oral control) is estimated across the several BMI levels and can be classified as a moderate effect. The ANOVA that followed exhibited the different profile of the dependent variables. More specifically, significant differences were found in the dieting and oral control subscales [F(3,365) = 4.79, p <

.01, η^2 = .04, και $F(3,365) = 6.20$, $p < .001$, $\eta^2 = .04$, respectively]. Tukey *post hoc* comparisons ($p < .05$) were also included for the groups' profile of the dependent variable (see Table 1).

Finally, in the third MANOVA, gender was used as an independent variable and a significant multivariate effect was established, Wilks' Lambda = .944, F (3,426) = 8.40, $p < .001$, $\eta^2 = .06$. The finding of $\eta 2 = .06$ maintains that the 6% of the total variance in "eating attitudes" variables is estimated by gender and can be classified as a moderate effect. The ANOVA that followed exhibited the different profile of the dependent variables. More specifically, significant differences were established in the dieting and oral control subscales [F (1,430) = 22.17, $p < .001$, n^2 = .05, και F (1,430) = 4.17, $p < .05$, $\eta^2 = .01$, respectively].

Eating Attitudes and Social Behaviour Correlations

Standard Multiple Regression Analyses (Tabachnick and Fidell, 2007) were used to investigate any possible intermediary role of social behaviour in the prediction of eating attitudes. In regression analyses, the B-WISE scale was used as a prediction variable for each one of the three dimensions of EB. Aiken and West (1991) noted that multiple regression is often more appropriate than ANOVA for naturalistic studies that involve measured variables. The results established a significant relationship of EB with two out of the three dimensions, dieting (R = .25, R^2 = .06, F (1,462) = 30.97, $p < .001$), estimating 6% of variance, and bulimia (R = .21, R^2 = .04, F (1,471 = 21.29, $p < .001$) estimating 4% of the variance. The rate «standardized beta» established a negative impact of social behaviour on the dieting (β = -.25) and bulimia (β = -.21) dimensions.

DISCUSSION

The purpose of the present study was to investigate the relation between eating and social behaviour. Furthermore, differences in the participants' EB, due to age, BMI and gender were also investigated.

The first hypothesis concerned the range of social and EB among a normal population. Initially, the results showed that eating attitudes and social behaviour concerning the normal population, exhibited no extreme manifestations whatsoever. According to recent research, EB is nowadays marginally normal in the case of individuals not suffering from any ED (Strong et al., 2008; Al-Rethaiaa et al., 2010). It should be stressed that maintaining a normal EB and adopting normal eating patterns can be challenging or simply not feasible, due to contemporary social, economic and cultural conditions and social structures established in some developed countries (Patel et al., 1998; Bachner-Melman et al., 2009; ten Have et al., 2011).

As regards the EB "oral control", underweight participants were characterized by extreme manifestations as compared to the rest of the groups. Contemporary research has established that underweight individuals, especially females, tend to follow stricter and exhaustive diets as a means to maintain an ideal body weight, compared with normal, overweight or obese individuals – and usually, anorexia nervosa or bulimia preceded this behaviour (Golden et al., 2008; Butryn et al., 2010; Støving et al., 2011).

With regard to the EB “bulimia and food preoccupation”, all weight subgroups exhibited an attitude similar to that of the obese participants, being slightly more bulimic. According to the literature available, increased bulimic symptoms are stimulated by emotional dysregulation and stress-related factors, regardless of BMI (Zysberg and Rubanov, 2010; Parylak et al., 2011).

The results of the present study, regarding the perceived social behaviour, established that the social attitude towards body image mainly attracted the interest of normal participants compared with that of the underweight, overweight or obese participants. Usually, the individuals who are obsessed with the social attitude towards body and self-image exhibit some deviation from normal or ideal BMI, without necessarily suffering from any eating or mental disorder (ter Bogt et al., 2006; Costarelli et al., 2011; Trujano Ruiz et al., 2010; Lillis et al., 2011).

The second hypothesis concerned the influence of age, gender and BMI on social and EB shapes and patterns among a normal population. In the present study, the shaping of an EB seemed to be significantly affected by the “age” factor. More specifically, results maintained that adolescents exercised considerably more self-control over their eating choices as compared to young adults (18-25 years) and a little more compared with adults (26-45 years). Such a finding is consistent with recent research supporting self-control and eating restrictions being more often observed among adolescents than young adults and adults (Hetherington, 1994; Brandsma, 2007). On the other hand, the tools that have been used in the present research boosted symptomatology that is more frequently met in adolescents. Thus, symptoms of other age categories are undermined. The fact that all ages are prone to a type of ED is supported according to contemporary references: adolescents are more prone to suffering from some typical ED, such as anorexia nervosa or bulimia and often exhibit a distorted self-image and low self-confidence (Kirkcaldy et al., 2007; Ali et al., 2010; Costarelli et al., 2011). Young adults are usually characterized by promiscuous EB (e.g. bulimia, malnutrition) rather than excessive self-control and strict diets, thus being a group highly susceptible to EDs, with their own individual characteristics, symptoms and types of ED (Strong et al., 2008; Nelson et al., 2009). Adults are usually addicted to binge eating and often follow diets (Hetherington, 1994; Brandsma, 2007; Ervin, 2008; Barry et al., 2009). Any cases of anorexia nervosa or bulimia in such age groups would have been established at some younger age and then perpetuated (Brandsma, 2007; Perkins et al., 2007; Huas et al., 2011).

Gender was another variable which was established to significantly affect the shaping of EB patterns. Results maintained that females follow diets more often and exercise more self-control over their eating choices compared with males. Furthermore, their interest in diet topics was more intense, whereas males were more interested in the social attitude towards their physical appearance. No statistically significant differences between the indexes of bulimia and preoccupation with food changed across gender were established. Contemporary literature agrees that females follow diets and exercise oral control more often compared with males (Rolls et al., 1991; Serdar et al., 2010). Conversely, fat and social phobic males, are not as preoccupied with diets or oral control as they are with excessive bodybuilding, weightlifting, excessive exercise and special diets based on food supplements, as a

response to the social construction of masculinity (Lee et al., 1993; Murray, 2007; Yager and O'Dea, 2008; Blashill, 2010; Koskina and Giovazolias, 2010). Concerning bulimic behaviour, gender is not as significant as individual personality traits (Brookings and Wilson, 1994; Elfhag and Morey, 2008; MacLaren and Best, 2009; Terracciano et al., 2009; Hartmann et al., 2010). However, bulimic males tend to consume more calories (Rolls et al., 1991), a form of emotional dysregulation expression, which is better diagnosed by instruments that scan motivations of ED in combination with food consumption diaries, as opposed to symptomatology screening tests, such as EAT-26 (Garner et al., 1982; Bellisle, 2009; Parylak et al., 2011). However, this difference, if present, could not be revealed due to research limitations. Nevertheless, EB deviating from normal in both males and females has been primarily attributed to low self-esteem and self-image (Stein and Corte, 2003; Koskina and Giovazolias, 2010).

Furthermore, according to the results of the present study, BMI slightly influenced the shaping of EB patterns. It has been established that obese participants followed a diet more often than any other group. Overweight and underweight participants followed a diet more often than the normal participants; however, this difference was not statistically significant. According to the literature, people who tend to follow diets are, in most of the cases, either obese or underweight (Golden et al., 2008; Butryn et al., 2010; Serdar et al., 2010).

Finally, the third hypothesis examined the interrelation of social and EB and their range in the normal population. The manifestations and differentiations existing among age and gender in dieting, oral control or food preoccupation, revealed populations sensitive in exposing DEB symptoms. Individuals with an extremity in one of the subscales could be interpreted as a high-risk for an ED.

A regression analysis was used to check if social behaviour can predict EB, and hence if non- normative social behaviour enhances DEB patterns which will subsequently become established. The results of the B-WISE scale and the predictive role of social behaviour of eating attitudes in a normal population were also investigated. Results have established that dieting and bulimia EB are related to specific psychosocial skills (self-esteem, self-confidence and the concept of self-image). According to contemporary research, people with an EB disorder or some predisposition for EDs tend to exhibit several psychosocial disabilities (e.g., problems with interpersonal relationships, low self-confidence and self-esteem, negative perception of self-image), which are attributed to low emotional intelligence (Costarelli et al., 2009), individual temperament (Brookings and Wilson, 1994; Elfhag and Morey, 2008) or a negative family environment (Brookings and Wilson, 1994).

Research limitations of the present study include the questionnaires not being counterbalanced to prevent the order affect. In addition, the large range of age group sample (12-45) and the mixing of adults and underage groups probably influenced the B-WISE reliability assumption which resulted in it being barely satisfactory. Better structured age group samples should be reconsidered for retesting reliability of the B-WISE scale in a normal Greek population. Thus, research limitations were encountered for social behaviour and EB correlations and the analyses mentioned in this section.

CONCLUSION

The findings of the present study lead to the conclusion that the normal range of EB patterns has become wider, while at the same time the separating line between normal and disordered EB has become harder to define. What leads to such a conclusion is that a large percentage of the participants in the present study follow diets, suffer from bulimic episodes and pay excessive attention to the social attitude towards their body image – all constituting factors predisposing people to some kind of ED. Demographic data (age and gender) and anthropometric characteristics (BMI) were factors which lead to some common denominators per age, BMI or gender subgroup, concerning EB patterns – though to a limited extent.

The complexity of EB is very difficult to analyse or define as there has been a variety of relevant theories (French and Jeffery, 1994; Keski-Rahkonen et al., 2007; Stein and Corte, 2008; Roehrig et al., 2009; Jacobs et al., 2011; Parylak et al., 2011). Prevention of EDs is currently orientated at adopting and implementing projects improving self-image and self-esteem – these two being the most important factors affecting EDs (Stein and Corte, 2003; Kavazidou et al., 2009; Stein and Corte, 2008).

According to the results, focus on the relation between body image concerns, weight status and eating attitudes reveal interesting behavioral schemes that are probably important for DEB diagnosis and treatment in the normal population. Taking into consideration the commonly accepted belief that self-image and self-esteem can be greatly reinforced through the increase of physical activity and maintenance of a normal BMI – which greatly depends on our eating attitudes and behaviour patterns (Teixeira et al., 2006; Strong et al., 2008) - appropriate exercise and diet programmes are suggested as prevention strategies (Teixeira et al., 2005) for people sensitive to DEB but still within normal populations.

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ACKNOWLEDGMENTS

Special thanks are given to Associate Professor Kardaras Panagiotis (School of Medicine, Aristotle University of Thessaloniki) who supported the data collection procedures in this study.

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