



A study on the interplay between emerging adulthood and eating disorder symptomatology in young adults

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Abstract

Purpose The primary aim of this study was to investigate the interplay between Arnett's five features of emerging adulthood and ED symptomatology. The secondary aim of the study was to investigate possible gender differences concerning the relation between emerging adulthood and ED symptomatology.

Methods 337 university students (252 females and 85 males) participated in this study. Each participant was asked to anonymously complete the following questionnaires: Inventory of the Dimensions of Emerging Adulthood (IDEA), Eating Attitudes Test (EAT-26), and Social Physique Anxiety Scale (SPAS).

Results The female group scored higher in the EAT-26 diet, SPAS, IDEA self-focus and IDEA total score measurements. Additionally, in the female group, identity exploration was correlated with EAT-26 total and bulimia, experimentation/possibilities with EAT-26 total and diet, and negativity/instability with EAT-26 total, diet and bulimia as well as SPAS score. In the male groups, the only significant correlation was between SPAS and instability/negativity. Finally, identity exploration could predict a higher probability of developing ED ($EAT \geq 20$) for both the female and male groups.

Conclusions Emerging adulthood and ED were found to have a close relationship, especially for females. Identity exploration was the emerging adulthood factor that showed the highest relation to ED symptomatology in both the male and female groups. More research is necessary to investigate the specifics of this relationship.

Level of evidence Level V, cross-sectional descriptive study.

Keywords Emerging adulthood · Eating disorders · Anorexia nervosa · Bulimia nervosa · Identity exploration

Introduction

In most western or westernized societies, when an individual crosses the barrier of 18 years of age, he/she is considered an adult [1]. Interestingly, most of the time, an individual at the age of 18 has not reached the level of maturity that is characteristic of adulthood [1]. A vast number of young people between the ages of 18 and 25 are studying at university or exploring different professions, have not yet created a family of their own, and sometimes still live with their

parental family [1]. Moreover, in Greece and other European countries, many of the young adults in this age range are financially dependent on their parents, since they have not achieved a level of employment that grants them a sense of autonomy [2]. The most profound reason for this dependence is the increased period of studying and training, compared to other European countries, that is needed to achieve a level of professional competency. During the last 20–30 years, many young Greek adults, after graduating from lyceum (the equivalent of high school), attempt to acquire some form of higher education degree, a process with a duration of 3–5 years [2]. Moreover, due to high unemployment rates caused by the ongoing financial crisis, a high percentage of young adults are compelled to pursue postgraduate studies to strengthen their curriculum and thus increase their probability of finding employment [3–5]. It is not uncommon for young Greek adults between 18 and 25 years of age to be studying in university or involved in some kind of low-pay

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training that does not enable them to lead an autonomous life [6].

In 2000, Arnett proposed the term “emerging adulthood” to describe the period of life when an individual is no longer an adolescent, since he/she is no more under parental or school control, but is not quite yet a full-fledged adult since he/she has not yet taken the necessary steps (such as stable impulse control) that lead to adulthood. This is a period of independent exploration [1, 7]. Moreover, in this period, many young people find it hard to describe themselves as fully grown adults [1, 7]. Arnett defined emerging adulthood as a period of development that bridges adolescence and young adulthood, during which young people are no longer adolescents, but have not yet attained full adult status [7]. Although the term “emerging adulthood” was developed and originally studied in the US, studies in European countries have shown similar characteristics with some differences, depending on social, environmental, parental, marital, and educational factors [8, 9]. Most of the research conducted in various European countries confirms that the period between 18 and 25 years is a transitional phase from adolescence to adulthood during which the young individual struggles to achieve a more autonomous way of living [9]. Different models of transition seem to exist, depending on the country of origin. The Mediterranean model is characterized by a prolonged coexistence with parents, while the northern European model is marked by the fact that the emerging adult experiments with different living conditions [9].

Arnett described five features that define emerging adults:

- (a) *Identity exploration* Young people decide who they are and what they want out of work, school, and romantic relationships.
- (b) *Negativity/instability* The post-school years are marked by repeated residential changes, as young people either go to university or live with friends or a romantic partner. For many, when families and careers are established in their thirties, these frequent moves end.
- (c) *Self-focus* Freed of the parental- and socially directed routines of school, young people focus on themselves as they try to decide what they want to do, where they want to go, and who they want to be with.
- (d) *Feeling in between* Many emerging adults say they are taking responsibility for themselves, but still do not completely feel or act like an adult.
- (e) *Multiple possibilities* Most emerging adults believe they have a good chance of living “better than their parents did”, and even if their parents have divorced, they believe they will find a lifelong soul mate [7, 10].

Emerging adulthood is a developmental period during which young individuals have, maybe for the first time in their lives, the ability to make independent choices regarding

eating habits, exercise routines, and attitudes towards their own body shapes and weights [11]. Moreover, during this period, a large number of individuals report low levels of body satisfaction and higher levels of disordered eating behaviors [12, 13]. Especially in young women, objectification and self-objectification, often related to menstrual experiences, have been associated with body shame and ED symptomatology [14–16]. In a study by Cain et al. [17], 18% of the interviewed women reported food intake restriction, and another 18% reported binge eating episodes. Moreover, 17% were in danger of developing one of the above eating behaviors, and 6% were concerned with perpetuating bulimic behavior (Cain et al. 2010). Although eating disorders (ED) usually have an onset during adolescence, there is a considerable number of young adults in the age group of 18–25 years that are suffering from an ED or have some kind of subclinical ED symptomatology. This is a possible indication that the population of emerging adults is at an elevated risk for ED (Nelson et al. 2008). There is evidence from longitudinal studies that 75% of adolescents who report disordered eating behaviors, and especially binge eating, will continue to engage in these behaviors after a period of 10 years [18, 19]. Depression and difficulties in emotional regulation seem to be two of the main factors related to ED during emerging adulthood [20, 21]. In recent years, it has been demonstrated that young men are also affected by disordered eating, due to worries about masculinity, social appearance, and peer acceptance [22]. Although it is now generally acknowledged that men exert a drive for muscularity instead of thinness, there remains a lack of research focusing specifically on male populations during emerging adulthood [21, 23]. Although there is a considerable amount of research on ED in women during the period of emerging adulthood, to our knowledge, there is no report yet on the relationship between the five features of emerging adulthood as described by Arnett and disordered eating behaviors in both genders.

Methodology

Aim

The vast majority of the research conducted so far has focused on ED and various factors, such as temperament, mood, and body satisfaction during the period of emerging adulthood. The primary aim of this study was to further investigate this transitional period of young adults’ lives by examining the relationship between Arnett’s five features of emerging adulthood and ED symptomatology. Since this was the first study on the interplay between psychological domains of emerging adulthood and ED symptomatology, it was conducted with an exploratory nature. Based

on previous suggestions that ED, and especially anorexia nervosa, can be attributed to difficulties in the formation of a personal identity [24] and that emotional dysregulation is strongly related with bulimia nervosa and binge eating [25], we hypothesized that identity exploration and instability would possibly be related with ED symptomatology, especially in young women. The secondary aim of the study was to investigate possible gender differences concerning the relation between emerging adulthood and ED symptomatology. Our hypothesis was that this relation would be mainly observed in young adult women rather than in men.

Sample

The study's sample consists of $N=335$ students from the National and Kapodistrian University of Athens (NKUOA). For convenience (a large number of students gathered in a single multi-level building), all selected students were attending classes at the philosophy, psychology, Greek, and foreign literature departments of NKUOA. Most of the students were between the ages of 18 and 25 years, since the duration of studying in these university departments is 4 years. Students over 25 years of age were excluded from the study. The mean age of the sample was 20.9 years (SD 1.5). With regard to gender, most of the students that choose to study in these university departments in Greece are female. Accordingly, our sample consisted mainly of young women (75.2%). From the 350 students that were approached, 335 agreed to participate in the study (95.7%). Of the 335 participants, 252 were female (75.2%) and 83 (24.8%) were male.

All participants provided written informed consent prior to the administration of the questionnaires. The study design was reviewed and approved by the scientific committee of the Psychology Department of NKUOA. The committee reviews the methodology of each research proposal and is commissioned to provide both scientific and ethical approval for each study. The committee provided ethical approval for the study according to the Declaration of Helsinki.

Procedure

For the purpose of the study, 350 NKUOA students were approached after lectures. The main researcher, ML, informed the teaching professor prior to his/her lecture about the research being conducted and acquired permission to address the students inside the lecture room at the end of the lecture. The researcher explained the main purposes of the study and handed the students the written informed consent form. The students who agreed to participate and signed the consent document were then handed the document with the questionnaires. The rest of the students were dismissed since their lecture had concluded. The whole procedure

lasted between 20 and 30 min, during which the researcher was available for clarification and information regarding the nature of the research. The collection of data was completed in a period of 2 weeks. To include the largest available number of students in the study, the researcher visited the university departments multiple times during those 2 weeks.

Measurements

Each participant was asked to complete the following four questionnaires anonymously:

- (a) *Eating Attitudes Test (EAT-26)* EAT-26 is one of the most often used questionnaires for measuring disordered eating attitudes [26]. The scale does not yield a specific diagnosis for an eating disorder by itself; however, it is consistently used as an effective screening instrument and has been found to be effective with clinical and sub-clinical populations [27]. EAT consists of 26 items, with 6 possible answers on a Likert-type scale. Each answer score varies from 0 (answers: “never”, “rarely”, “sometimes”) to 3 (answer: “always”), providing a total score of 0–78. Higher scores indicate higher disordered eating attitudes. EAT-26 has been translated into Greek and validated by Simos (doctoral thesis, 1996). EAT-26 consists of three subscales: diet, bulimia, and oral control. According to the Greek edition of the scale, participants scoring equal to or above 20 are considered “at risk” for ED. For the present study, Cronbach's alpha was calculated at 0.87 (diet 0.85, bulimia 0.77, and oral control 0.68).
- (b) *Social Physique Anxiety Scale (SPAS)* SPAS is a questionnaire for the measurement of anxiety related to physical appearance that an individual experiences when she/he is exposed in a variety of social conditions [28]. SPAS consists of 12 items, with five possible answers on a Likert-type scale. Each answer score varies from 1 (not at all) to 5 (very much). SPAS has been found to possess high-reliability and validity [29]. SPAS has been translated into Greek and validated by Psychountaki et al. [30]. For the present study, Cronbach's alpha was calculated at 0.85.
- (c) *Inventory of the Dimensions of Emerging Adulthood (IDEA)* IDEA is a questionnaire that measures the respondent's perception of self-development from adolescence to adulthood [31]. IDEA consists of 31 items, with four possible answers on a Likert-type scale. Each answer score varies from 1 (totally disagree) to 4 (totally agree). IDEA consists of six subscales: identity exploration, experimentation/possibilities, negativity/instability, self-focused, feeling “in-between”, and other-focus [32]. IDEA has been translated into Greek and validated by Galanaki et al. [32]. For the present

study, Cronbach's alpha of the other-focus subscale was low (0.45), and thus, this subscale was excluded from the analysis. Other-focus subscale is not one of the five focal dimensions of emerging adulthood; rather, it is an "extra subscale" that enables investigators to see if low self-focus is correlated with high other-focus (and vice versa) [33]. Cronbach's alpha for the rest of the scale was found to be satisfactory at 0.73 (identity exploration 0.76, experimentation/possibilities 0.72, negativity/instability 0.73, self-focused 0.67, feeling "in-between" 0.77).

- (d) Finally, each participant was asked to provide the following data: age, family status, present height and weight, lowest weight after the age of 17 [to calculate the relevant Body Mass Index (BMI)], financial sources (self-sufficient, relying on family support, or both), accommodation status, evaluation by the participant of his/her parents' relationship, and family atmosphere [from 1 (very bad) to 5 (very nice)].

Statistical analysis

Statistical analysis was conducted using SPSSv22 software. A Kolmogorov–Smirnov *Z* test was conducted to detect BMI, EAT-26, SPAS and IDEA shape of distribution. The *Z* test showed that the hypothesis that the above variables had a normal distribution could be retained for all tested variables. Based on the above results, parametric tests were used for the analysis of the study's results, Chi-square was used for the comparison of nominal variables, and Pearson's *r* test was used for the exploration of possible correlations between ED symptomatology and emerging adulthood measurements. Finally, a binary stepwise logistic regression analysis was used to explore factors of emerging adulthood that could predict a higher probability of disordered eating attitudes. The Hosmer–Lemeshow test was used to test whether the model produced from logistic regression possessed goodness of fit. Additionally, Nagelkerke R^2 was calculated.

Availability of data and materials Data are available on reasonable request to the corresponding author.

Results

Gender differences

The hypothesis concerning gender differences was that the two groups would be similar with regard to their demographic data, but may have differences in the clinical measurements. More specifically, the female group was expected to score higher in the EAT-26 and SPAS measurements. Additionally, differences were expected to be found in the

IDEA scores of the two genders according to the literature findings. The *t* test and Chi-square were used for the comparison of the mean scores of numerical and nominal variables accordingly.

Thirty-nine of the 252 females (15.5%) and ten of the 85 males (11.8%) scored equal to or more than 20 in EAT-26, a difference that was not found to be significant ($p=0.6$). There was also no significant difference between males and females in their mean age (females 20.8; males 21.3 $p=0.06$), financial sources (65.1% of the females and 60% of the males depended on their parents, $p=0.5$), accommodation (73.4% of the females and 67.1% of the males lived with their parents, $p=0.3$), parental relation (78.4% females and 76.2% males rated the relationship as nice or very nice, $p=0.9$), or the family atmosphere (80.8% females and 76.5% males rated the atmosphere as nice or very nice, $p=0.6$).

The female group scored higher in the EAT-26 diet, SPAS, IDEA self-focus, and IDEA total score measurements. They also reported lower BMI, lower minimum BMI, and maximum BMI after the age of 17 (Table 1).

Correlation between eating disorders and emerging adulthood

The hypothesis concerning the correlation between ED symptomatology and emerging adulthood was that it would be stronger in the female group, and that identity exploration and instability would be the two IDEA factors that would be correlated with ED symptomatology. Pearson's *r* test was employed for the exploration of possible correlations

Table 1 Gender differences (*t* test, significance level 0.05)

Measurement	Female		Male		<i>p</i>
	Mean	SD	Mean	SD	
BMI	21.2	3.5	24.8	3.1	0.001
BMI min	19.6	2.9	21.8	2.7	0.001
BMI max	23.6	4.5	26.3	4.1	0.001
EAT-26 total	10.7	9.3	9.1	8.7	0.174
EAT-26 diet	5.5	3.1	4.1	3.2	0.044
EAT-26 bulimia	2.1	2.1	2.2	1.7	0.551
EAT-26 oral control	3.3	3.1	2.8	1.6	0.316
SPAS	32.9	9.3	29.3	7.7	0.010
IDEA total	86.9	12.2	83.4	11.2	0.014
IDEA identity exploration	20.5	4.3	19.8	3.8	0.178
IDEA experimentation/possibilities	14.1	3.2	13.7	3.3	0.329
IDEA negativity/instability	18.3	4.2	17.9	4.2	0.394
IDEA self focused	17.7	3.4	16.5	3.1	0.003
IDEA feeling in between	8.6	2.6	8.3	2.4	0.322

SD standard deviation, *BMI* body mass index

between ED symptomatology and emerging adulthood measurements.

In the female group, multiple correlations were found. Identity exploration was significantly correlated with EAT-26 total and bulimia, experimentation/possibilities was correlated with EAT-26 total and diet, and negativity/instability with EAT-26 total, diet, and bulimia, as well as SPAS score. Finally, feeling in-between was significantly correlated with SPAS (Table 2).

In the male groups, the only correlation that was significant was between SPAS and instability/negativity ($r=0.3$, $p=0.02$).

Factors related to disordered eating attitudes

The hypothesis concerning the factors related to disordered eating attitudes was that it would include IDEA identity exploration and instability, SPAS measurements, and

probably BMI. The *t* test and binary stepwise logistic regression analysis were used to explore factors of emerging adulthood that could predict a higher probability of disordered eating attitudes ($EAT-26 \geq 20$).

The analysis showed that the female group that reported disordered eating attitudes ($EAT-26 \geq 20$) had higher BMI, SPAS, IDEA total and identity exploration scores than the group of women that had scored lower than 20 in EAT-26. In the male group, those who reported disordered eating attitudes had lower IDEA total and identity exploration scores (Table 3).

Binary stepwise logistic regression analysis examined the factors that were related with EAT-26 being positive (≥ 20) or negative (< 20). The factors that were input were IDEA subscales, SPAS, BMI, and age. The data analysis for the female group showed that higher BMI (OR 6.2, $p=0.01$) and identity exploration (OR 4.9, $p=0.03$) scores could predict a higher probability of $EAT-26 \geq 20$, which means a higher

Table 2 Correlation between eating disorders and emerging adulthood measurements in the women group

	IDEA total	IDEA identity exploration	IDEA experimentation/possibilities	IDEA negativity/instability	IDEA self focused	IDEA feeling in between
EAT-26 total	$r=0.2, p=0.013$	$r=0.1, p=0.030$	$r=0.1, p=0.043$	NS	NS	NS
EAT-26 diet	$r=0.2, p=0.005$	NS	$r=0.1, p=0.027$	NS	NS	NS
EAT-26 bulimia	$r=0.1, p=0.040$	$r=0.1, p=0.029$	NS	NS	NS	NS
EAT-26 oral control	NS	NS	NS	NS	NS	NS
SPAS	NS	NS	NS	$r=0.2, p=0.001$	NS	$r=0.2, p=0.014$

Pearson’s correlation matrix, significance level 0.05

r Pearson’s correlation, *NS* non-significant

Table 3 Factors related with eating attitudes (*t* test, significance level 0.05)

Measurement	EAT-26 ≥ 20	Female			Male		
		Mean	SD	<i>p</i>	Mean	SD	<i>p</i>
BMI	Yes	22.4	5.0	0.015	21.8	2.0	0.732
	No	20.9	3.1		21.2	1.7	
IDEA total	Yes	91.0	13.3	0.024	75.8	7.1	0.022
	No	86.2	11.8		84.4	11.3	
IDEA identity exploration	Yes	21.8	4.5	0.045	16.8	2.4	0.006
	No	20.3	4.3		20.2	3.7	
IDEA experimentation/possibilities	Yes	14.7	3.4	0.156	13.7	2.9	0.966
	No	13.9	3.1		13.7	3.3	
IDEA negativity/instability	Yes	19.5	4.5	0.055	15.5	1.5	0.063
	No	18.1	4.1		18.2	4.4	
IDEA self-focused	Yes	18.0	4.0	0.609	15.8	2.5	0.437
	No	17.7	3.2		16.6	3.2	
IDEA feeling in between	Yes	9.2	2.6	0.104	7.6	2.6	0.375
	No	8.5	2.6		8.3	2.4	
SPAS	Yes	39.1	10.4	0.001	30.3	9.3	0.674
	No	31.7	8.6		29.2	7.5	

SD standard deviation, *BMI* body mass index

probability of developing eating disorder symptomatology. The Hosmer–Lemeshow test was not significant ($p=0.5$), indicating that the model produced by logistic regression had goodness of fit. The Nagelkerke R^2 was 0.7, indicating that the two factors model that was produced by logistic regression could account for 69% of the EAT-26 variance from negative to positive (Table 4).

Binary stepwise logistic regression analysis for the male group showed that only the identity exploration (OR 9.0, $p=0.01$) score could predict a higher probability of EAT-26 ≥ 20 , which means a higher probability of developing eating disorder symptomatology. The Hosmer–Lemeshow test was not significant ($p=0.07$), indicating that the model produced by logistic regression had goodness of fit. The Nagelkerke R^2 was 0.2, indicating that the two factors model produced by logistic regression could account only for 18% of the EAT-26 variance from negative to positive (Table 4).

Discussion

The study produced three major results with regard to the relationship between emerging adulthood and ED symptomatology. The first was that the relation between these two variables was heavily influenced by gender. Although the two groups were quite similar in terms of demographic data and clinical measurements, the correlation analysis between IDEA and ED measurements produced far more relations between emerging adulthood and ED symptomatology in the female group than in the male group. The above observation can possibly serve as an indication that, in the female population, the manifestation of ED symptomatology is highly related to certain dimensions of the natural process of emerging adulthood. The findings showed that the female group scored higher in dieting and physique anxiety measurements. They were also more self-focused than young men. It is known that young women have higher anxiety than men with regard to their appearance, and especially their weight, since the western societies' beauty standards are still quite lean [34, 35]. Moreover, objectification of the female body can lead young women to a never-ending vicious cycle

of body shame and perfectionistic struggle to “improve” their body [14–16]. The above often results in long-term, and sometimes excruciating, diets, especially in young girls with low self-esteem and depressive symptomatology [35]. Self-focus is a necessary step for a young adult to achieve a level of autonomy that can enable him/her to function as an individual. Emerging adulthood is a period of life when self-focused behaviors are facilitated even more so than in adolescence or adulthood [10]. In terms of gender differences, it was found that women score higher than men in the measurement of self-focus as part of their transition from adolescence to adulthood [7].

The second major finding of this study was that most of the emerging adulthood dimensions were correlated with ED symptomatology, especially in the female group. The only dimension that was not correlated with either EAT-26 or SPAS was self-focus. Additionally, from the EAT-26 subscales, oral control was the only one that did not show any correlation with IDEA. Conversely, the instability/negativity dimension was correlated with most ED measurements. Furthermore, the correlation between instability/negativity and social anxiety produced by physical appearance was the only one that was also found in the male group. Searching for alternative ways of managing different areas of their lives, young adults experiment in a variety of ways, thereby experiencing a state of constant instability. This state of constant instability enables the young adults in reforming their plans according to their new expectations, but it can also induce extreme stress and intense emotions [10]. The findings can be viewed in relation with the fact that since physical appearance plays an important role in bolstering adolescents' and young adults' self-confidence, when they perceive their life as unstable, their worry concerning their appearance increases [36, 37]. Burt et al. have reported an association between negative emotionality and ED symptoms in emerging adulthood [20]. This association was only significant in the context of low effortful control. Interestingly, it has been reported that while weight was the main concern for young women with regard to their physical appearance, young men were mainly concerned with stature [37].

The third major finding was that identity exploration was the only emerging adulthood dimension that was related with high risk of developing ED (EAT ≥ 20). The above relation was stronger in the female group than the male group, especially when combined with increased BMI. It is quite interesting that in the male group, high risk for ED (EAT ≥ 20) was related with lower identity exploration measurements, while in the female group, this relation was inverse as high risk for ED (EAT ≥ 20), related to higher identity exploration measurements. Moreover, in the female group, regression analysis produced a model where higher BMI, combined with high-identity exploration scores, could predict high risk for ED (EAT ≥ 20). The process of identity

Table 4 Factors related to disordered eating attitudes (EAT-26 ≥ 20)

	<i>B</i>	<i>SE</i>	Wald	<i>p</i>	<i>OD</i>
Female group					
BMI	−0.1	0.05	5.6	0.018	6.1
IDEA identity exploration	−0.1	0.05	4.4	0.035	4.9
Male group					
IDEA identity exploration	0.3	0.1	6.6	0.010	9.0

Binary stepwise logistic regression analysis. Significance level 0.05
SE standard error, *OD* odds ratio, *BMI* body mass index

formulation starts at adolescence and extends to the period of emerging adulthood. Apart from the formation of identity, another developmental feature is the sense of self-control, and the development of close interpersonal relationships. Young individuals, to be able to cope with the obligations of everyday life, should form a stable identity that will help them to organize their lives [10]. The relationship between difficulties in the exploration and formulation of a personal identity and ED has been rigorously investigated in the past. The intense emotions that this exploration can produce often lead young adults (and especially young women) to use food as a way of regulating their emotions and/or to regain some form of control over their lives. Young adults are trying to develop skills to organize their new lives, and this effort might create psychological difficulties or maintain and perpetuate preexisting difficulties [17]. Stein and Corte found that women with ED had fewer positive, more negative, and highly interrelated self-schemas compared to the control group [38]. These self-concept properties predicted eating disordered attitudes and behavior [38]. Furthermore, problems with identity formation in patients suffering from ED have been related with non-suicidal self-injury [39]. Another area of identity that has also been explored in ED is the formulation of gender identity and its role in body image psychopathology [40].

An interesting result was that although the percentage of students that scored over 20 in EAT-26 was higher in the female group, the difference was not statistically significant. Furthermore, the comparison of the subscale scores showed that only the “diet” EAT-26 subscale was significantly higher in the female group. Conversely, the mean score of EAT-26 bulimia, as presented in Table 1, was almost identical between the two groups. Although there is no definite explanation for this result, there are two observations that can be made. First, considering that the mean BMI of the male group is close to the upper normal limit (BMI 24.8), the group could include a considerable number of young male students who exhibit binge eating symptoms, and thus, score high in the EAT-26 bulimia subscale. Binge eating symptomatology and weight control behaviors have recently been found to be as frequent in male student groups as in female students [41, 42], especially when the body weight is increased [43]. Second, higher or equal EAT-26 scores in males than in females have been reported recently in studies conducted outside western universities, thus raising an issue of interplay between cultural differences and disordered eating behaviors in male populations [44–46].

The study had four main limitations. Firstly, the sample consisted solely of university students. University students in Greece are roughly one-third of the population of young adults between 18 and 25 years of age. Results of studies conducted inside the university campus cannot easily be generalized to the whole population of young adults. Most

of the students in Greece depend on their parents for financial support and usually stay with their families if they are studying in their hometown. As they do not have to work and take care of their household, they often have more free time to spend in various mental or physical activities than their peers who have to work, sometimes more than 10 h every day. Secondly, the number of men who participated in the study was significantly smaller than the number of women. The weaker link between ED and emerging adulthood in men could be attributed partially to the small number of male participants. Thirdly, ED symptomatology was measured by self-report questionnaires, thus providing us with only an estimate on the participants’ eating attitudes, and not an accurate clinical diagnosis of ED. Last, but not least, the study’s cross-sectional design hindered any definite conclusions on the relationship between emerging adulthood and ED symptomatology, especially on the temporal aspect of this relation.

Conclusions

Emerging adulthood is an important theoretical construct, as it describes a period of life when an individual is in transition between adolescence and adulthood. Interestingly, ED are a cluster of mental disorders that usually emerge and/or progress during this period of time. Emerging adulthood and ED were found to be closely related, especially in the case of female participants. It is common knowledge that women are more vulnerable to develop ED symptomatology for various reasons that are not yet clearly defined. The dimension of instability/negativity was the most related to ED symptomatology of emerging adulthood, while the self-focused dimension—a part of the process of individualization—was the least related to ED symptomatology. Finally, identity exploration, a dimension of human development that has been related in various research with the manifestation of ED, showed the highest relation with high risk of developing ED ($EAT \geq 20$). Although the type of this relationship could not be established, it is important to expand the research on emerging adulthood to the area of psychopathology that is characteristic of this specific transitional period of human development.

Recent studies on the etiology of ED have focused on the epigenetic mechanisms that link environmental exposure to gene expression [47]. Examples of environmental stress are obstetric complications, childhood abuse, and the effects of malnutrition caused by extreme dieting. Another example of environmental exposure could be the stress experienced during the transition from adolescence to adulthood. From a clinical perspective, it would be helpful for therapists who specialize in the treatment of ED to keep in mind that the etiological and perpetuating mechanisms of ED are

not only linked with abnormal conditions such as abuse or extreme dieting, but with the stress that is produced by the expected transition from childhood to adolescence and from adolescence to adulthood. It goes without saying that more research is needed, especially with a longitudinal design, to further explore and establish the link between emerging adulthood and ED symptomatology.

Compliance with ethical standards

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all individual participants included in the study.

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