DOI: 10.26387/bpa.2022.00003

Food and alcohol disturbance in Italy: A reality? An epidemiological study on under 40

Ilaria Consolo[1], Tjuana Foffo[2]

[1] Psychologist, Psychotherapist, Expert in Addiction, Sexologist, Istituto Italiano di Sessuologia Scientifica, Rome, Italy
[2] Psychologist, Sexologist, Expert in Addiction, Istituto Italiano di Sessuologia Scientifica, Rome, Italy

ilariaconsolo@tiscali.it

ABSTRACT. Lo studio ha indagato la presenza del *food and alcohol disturbance* (*FAD*) in un campione di 716 abitanti della penisola italiana, tra i 14 e i 40 anni di età. Si tratta del primo studio epidemiologico in Italia sul FAD. I risultati indicano come i predittori dello sviluppo del fenomeno in oggetto siano sia un disturbo del comportamento alimentare che un abuso di alcol; l'attività fisica non sembra invece essere un fattore predittivo, mentre sembra esserlo la limitazione nell'assunzione di calorie. Il FAD pare essere concentrato in specifiche aree geografiche dell'Italia.

SUMMARY. The aim of the present study is to study the presence of food and alcohol disturbance (FAD) in Italian participants aged between 14 and 40 years old, and to examinate the relationship between FAD and eating disorders (EDs), alcohol abuse, and the intensity of physical exercise. A sample of 716 (74% women, mean age = 23 years old) participants rated a series of self-report measures by using an online survey. Measures included: a questionnaire to obtain information about age, gender, alcohol use, geographical provenience, and education; EAT-26 test; AUDIT test; and an ad hoc measure to obtain information on FAD. 84.1% of the sample had a middle school license or higher levels of education. 11.9% had significantly high scores at the EAT-26 test, 8.4% at the AUDIT. FAD behaviors were found in .85 % of the sample, who obtained significant scores in all three measures. Pearson's correlation analysis showed a significant relationship between EAT-26 and DQ, and between AUDIT and DQ. ANOVA and Factor Analysis, used to verify the validity of the DQ, showed positive results. Results show that both an ED and alcoholic abuse predict FAD, while physical activity does not seem to be a predictive factor. Further studies are necessary in order to diagnose, prevent and treat FAD.

Keywords: *Eating disorder, Alcohol-related disorders, Addiction, FAD, Physical exercise*

INTRODUCTION

New York Times media in 2008 have developed the term drunkoressia to indicate a phenomenon which includes the specific characteristics of an eating disorder (ED) related with alcohol abuse (CBS News, 2008; Kershaw, 2008; Smith, 2008; Stoppler, 2008). This term refers to the phenomenon of restricting food intake and starving before using alcohol, which is quite common among young adults. More recently, Choquette et al. (2018) have stated that the

term drunkorexia should not be considered a diagnostic label, but should instead indicate specific eating behaviors. The authors have suggested the use of the term food and alcohol disturbance (FAD), which refers to a clinical phenomenon related to a series of actions which include calories restriction, excessive physical exercise and various compensatory behaviors adopted before, during and after using alcohol to compensate the calories intake or to maximize the intoxication (Choquette et al., 2018; Horvath, Shorey & Racine, 2020). According to scientific literature, those who have been labeled as FAD are mostly university-aged people who drink heavily and don't eat much during the day to compensate the alcohol-related calories intake that they know they will have in the evening (Barry & Piazza-Gardner, 2012). People who limit their caloric intake and/or practice excessive physical exercise to compensate the calories related to alcohol use may be suffering from an eating disorder (ED), an alcohol-related disorder, or both. However, scientific literature has suggested how those who eat less to drink more without gaining weight tended to have higher scores in relation to disordered eating behaviors, while those who intoxicate more rapidly had higher scores in measures related to alcohol abuse (Roosen & Mills, 2015).

There is an interesting association between FAD, and binge eating with EDs: high levels of food restriction, which are typical of both binge eating and FAD, are associated with higher alcohol-related problematics (Stewart, Angelopoulous, Baker & Boland, 2000), and previous studies have enlightened an association between the use of alcohol and dysfunctional eating behaviors in university students (Krahn, Kurth, Gomberg & Drewnowski, 2004). Those who limit their caloric intake or use compensatory behaviors in order to compensate the calories related to the alcohol intake may suffer from EDs, substance related disorders or both. Disordered eating and the use and abuse of alcohol are frequent in university students, and are often in comorbidity (Horvath et al., 2020). Some authors have also enlightened an association between binge drinking and FAD, and EDs: higher levels of food intake restriction, which are typical of both FAD and binge drinking, are associated with higher alcohol intake (Barry & Piazza-Gardner, 2012). The main difference between FAD and anorexia nervosa is that in FAD body weight issues are related to the alcoholic intake: starving is the precondition for drinking. However, as time goes by, the FAD motivation may become an anorexic motivation, losing weight may become the main purpose and patients may feel powerful when they overcome hunger. Starving can become important in relation to avoid weight gain and to maximize the effects of alcohol by drinking heavily on an empty stomach, with all the related physical consequences. According to Thompson-Memmer, Glassman and Diehr (2018), FAD behavior, which the authors have labeled alcoholimia, is part of an ED with alcohol related problematics that must be addressed during therapy.

Although the term FAD has been used both in scientific and popular literature, the diagnosis and treatment of this disorder is still problematic, and there is no fixed parameter in relation to the quantity or intensity of the pathological behaviors (Thompson-Memmer et al., 2018). Moreover, research on this topic is still scarce, and there is a lack of consensus on the psychological consequences of these behaviors and on the (potential) differences related to gender, which however so far have not been found (Horvath et al., 2020).

This disorder has mostly been described in the university population of the USA, however more recent research is also investigating different populations (e.g., older people) (Moeck & Thomas, 2021). Further research has also been conducted in Europe, and studies have demonstrated that FAD is a transcultural problematic, which predictors however may change in relation to different cultures. Therefore, culture should be considered when tailoring a specific intervention (Choquette et al., 2018). Moreover, there is a need for studies which are focused on potential gender differences in FAD behaviors, since data on this topic are still missing. The present study aims at investigating the presence of FAD behaviors in Italy and the relationship between FAD, EDs, alcohol intake and the amount of physical activity.

METHOD

Participants and procedures

The present study represents an observational prospective study which investigated the characteristics of FAD in Italy by using self-report questionnaires. The participants were people aged between 14 and 40 years old, recruited on the Internet by a survey conducted online. The only exclusion criterion was related to age. All participants provided written informant consent before starting the survey. The study was conducted by ethical standards, following the 1964 Helsinki declaration (WMO, 1964) and its later amendments.

Measures

Self-report measures included a questionnaire to obtain personal information (i.e. age, sex, height, geographic origin, education) and the following measures.

- The *Eating Attitude Test – 26* (*EAT-26*; Garner, Olmsted, Bohr & Garfinkel, 1982; Marronaro, Rossi, Aquilio & Scacchioli, 2009), is one of the most widely used measures for the assessment of symptoms and concerns related to EDs, and is a reliable measure for the screening of high risk populations. It is composed by 26 items, with a cut-off of 20. Scores which are higher than 20 indicate an ED risk. In the present study alpha was .87 indicating good psychometric properties.
- The *Alcohol Use Disorders Identification Test* (*AUDIT*; Saunders, Aasland, Babor, de la Fuente & Grant, 1993; Struzzo, Faccio, Moscatelli, Scafato & PRISMA Gruppo, 2006), rates the frequency and amount of the alcohol intake and can identify an excess in the alcoholic intake or an alcohol-related disorder. AUDIT is a 10-item questionnaire which covers the domains of alcohol consumption, drinking behaviour, and alcohol-related problems. Responses to each question are scored from 0 to 4, giving a maximum possible score of 40. Scores ranging between 1 and 7 are considered related to a low risk, scores comprised between 8 and 14 indicate alcohol-related problematics and possible risky behaviors, scores comprised between 15 and 40 correlate with an alcohol-related disorder. In the present study alpha was .85 indicating good psychometric properties.
- An ad-hoc measure for the assessment of FAD (the DQ), composed by four questions on the use and abuse of alcohol in the last 30 days, in which the authors aim at having information on whether the person has reduced the calories' intake before drinking or whether after drinking there have been inappropriate compensatory behaviors or an increase in physical exercise. The afore mentioned questions were developed from the existing scientific literature on the topic, which has documented a positive relationship between the level of physical activity and alcohol intake (Pate, Heath, Dowda & Trost, 1996; Piazza-Gardner & Barry, 2012; Westerterp, Meijer, Goris & Kester, 2004), the recurring restriction of food intake before ingesting alcohol (Burke, Cremeens, Vail-Smith & Woolsey, 2010) and the association between EDs and the increase of physical exercise.

Analytic plan

Descriptive analyses were calculated for the whole sample. We used the tables of frequency to analyze scoring data. Spearman's correlations were calculated between the measures. ANOVA was used to test the possible relationship between sex and results. Cronbach's alphas were calculated for each measure. As for the DQ, explorative factor analysis was uses to test the reliability of the measure. We analyzed the demographic characteristics of the participants who scored above the cut-offs of the adopted measures (i.e., who had alcohol related or eating disorders).

RESULTS

The final sample was composed by 716 participants, with an age ranging between 14 and 40 years (M = 26.72). 74% of the sample was composed by women. The only exclusion criterion was related to the age of the participants, which had to be comprised between 14 and 40 years old.

The sample was composed by 716 valid cases, of whom 186 were men (26%), and 530 women (74%). The average age of the sample was 26.72 years old (SD = 6.77; min = 14; max = 40; median = 27.00; mode = 27.00). The average weight was 64.51 kg (SD = 14.15), ranging from 39 to 166 kg (median = 62.5; mode = 50). The average height was 1.68 mt (SD = .09), ranging from 1.45 to 1.94 mt (median = 1.67; mode = 1.60).

The average BMI was 22.84 (SD = 4.09), ranging from 14.50 to 51.23. According to Italian guidelines, the sample was composed by 478 persons with an average weight (66.8%), 133 overweight participants (18.6%), 18 obese (first degree obesity; 2.5%) and 16 severely obese participants (2.2%), 66 underweight (9.2%), and 4 severe underweight persons (.6%). One participant did not indicate his weight.

The sample was composed mostly by Italian (98.3%), and by Albanian (.8%) participants. The .1% if the sample came from Romania, Bolivia, China, Colombia and Philippines. The 38.8% of the sample lives in a village (278 cases), 49.6% in a town (355 cases) and 11.6% in a city (83 cases).

32.4% of the sample came from Lazio (n = 232), then Basilicata (17.3%, n = 124), Abruzzo (12.2%, n = 87), Apulia (6.8%, n = 49) and Campania (6.0%, n = 43). Sardinia (5.2%, n = 37), Lombardy (4.1%, n = 29), Tuscany (2.4%, n = 17), Emilia Romagna (2.2%, n = 16), Marche (2.1%, n = 15), Umbria and Sicily (both 2.0%, n = 14 each), Calabria (1.8%,

n = 13), Veneto and Molise (1.1%, *n* = 8 each), Piedmont (.4%, *n* = 3), Valle D'Aosta (.3%, *n* = 2), Liguria (.1%, *n* = 1); .3% came from abroad (*n* = 2).

7% of the sample were secondary school students (50 cases), while 8.9% of the sample had completed secondary school (64 cases), 20.9% had graduated from high school (150 cases), 21.4% had a bachelor's degree (153 cases), 29.6% a master's degree (212 cases), 12.2% had a higher education degree (e.g., PhD, master, post-graduation school; 87 cases).

EAT-26 results (716 valid cases) showed an average score of 8.96 (*SD* = 10.52; variance = 110.72; min = 1; max = 68). There were 85 positive cases which scored higher than 20 (cut-off) (11.9%) (see Figure 1).

AUDIT (716 cases) average score was 2.41 (*SD* = 3.74, variance = 13.98; min = 0; max = 23). 91.6% of the sample were in at low-risk (*n* = 656) while 6.6% had possible alcohol-related problems (*n* = 47), and 1.8% had a probable alcohol-related substance use disorder (*n* = 13) (see Figure 2).

DQ results (716 valid cases) indicated a mean score of 17.31 (*SD* = 2.37); variance = 5.64; min = 7; max = 20). The final items of the questionnaire have an opposite rating, therefore higher scores indicate a low risk, while low score indicate a high risk (see Figure 3).

Five-hundred and seventy-five cases (80.3% of the sample; 153 men [21.4%]; 422 women [58.9%]) did not reach the cut-off for any of the measures.

Figure 1 – EAT-26 results

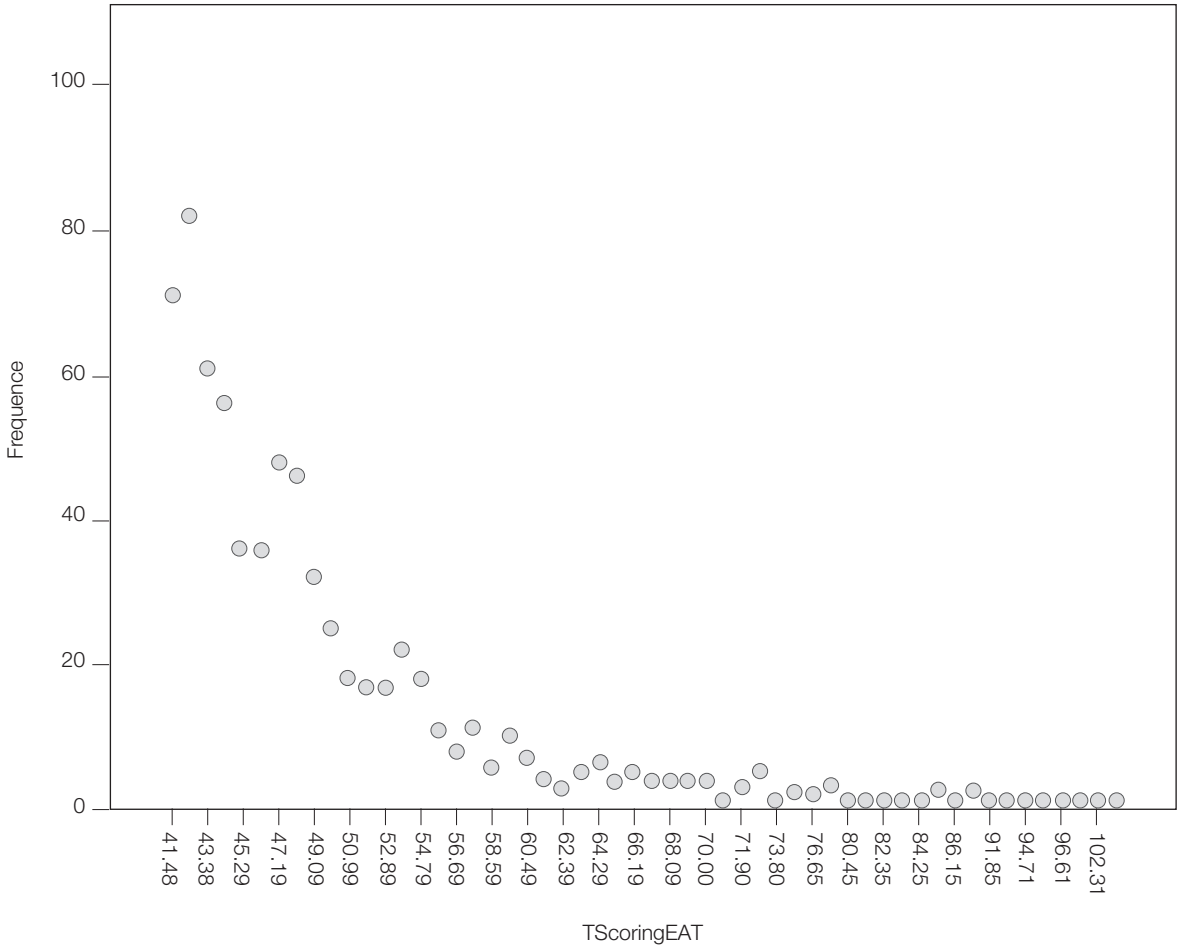
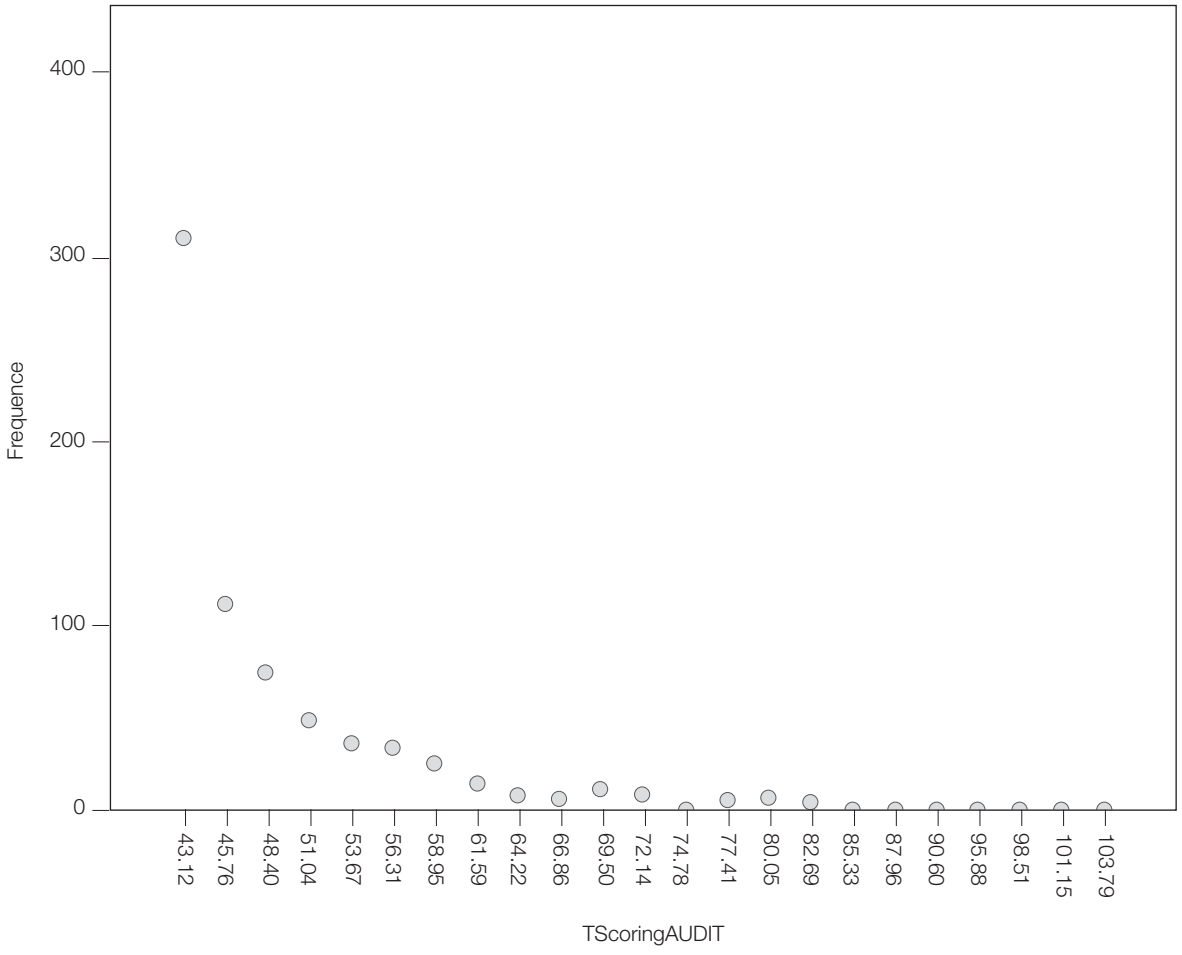


Figure 2 – AUDIT results



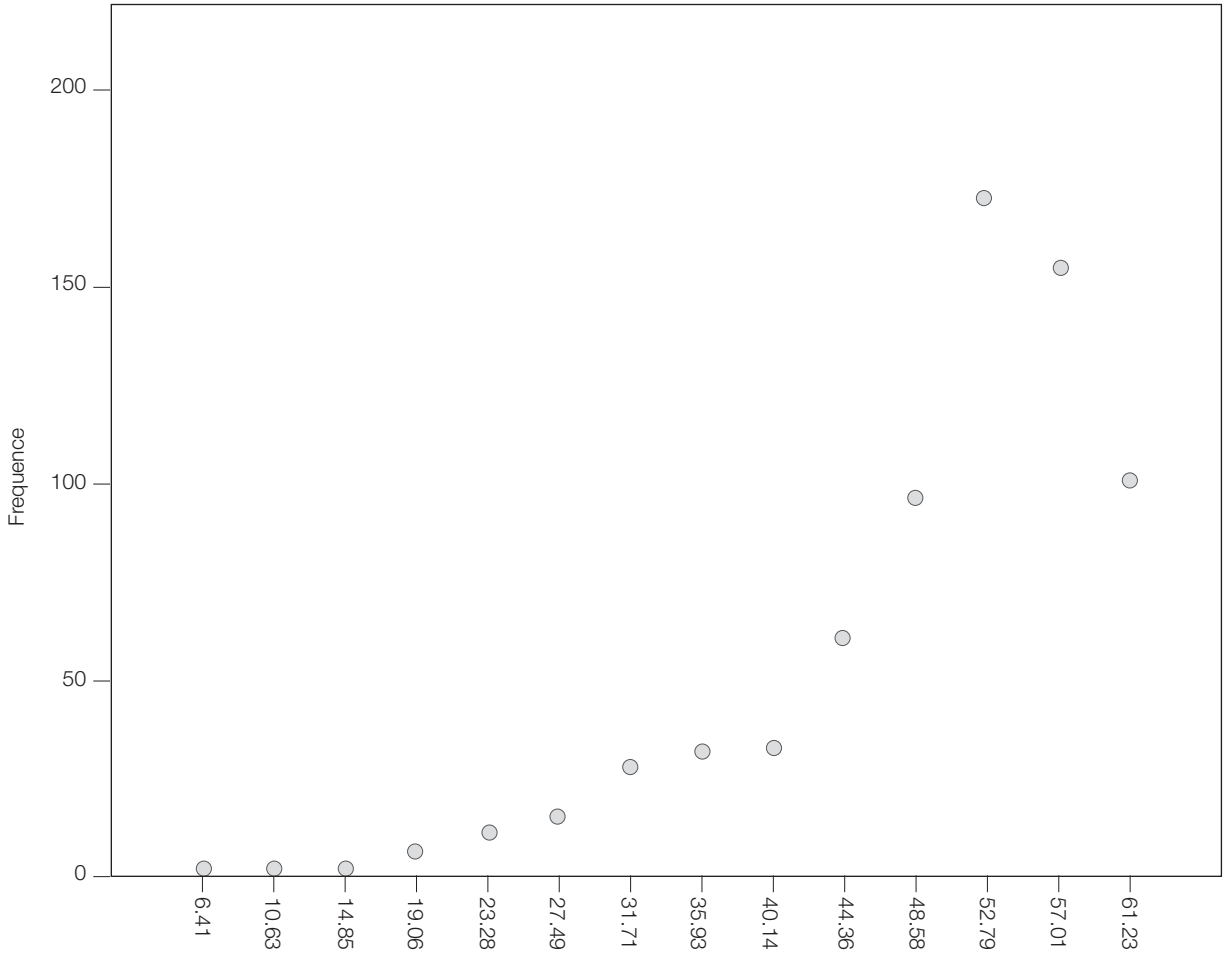
Data analysis enlightened the presence of significant answers in .98% of the population (7 cases), while 1.81% had significantly high scores at EAT-26 and DQ (13 cases) and 1.12% (8 cases) at the AUDIT and the DQ (see Figure 4).

Descriptive analysis of this specific sub-sample of 7 cases indicated a mean age of 24.6 years old (min = 14; max = 34; mode = 14). The BMI of the sample ranged from 17.58 to 24.97, with one person being underweight and the other 6 having an average weight (underweight = 16≤BMI≤18.49; average weight = 18.50≤BMI≤24.99 according to Italian Ministry of Health). In relation to the geographical provenience of the participants of this subsample descriptive analysis showed that 5 came from Basilicata, 1 from Lazio, and 1 from Abruzzo which are the second, the first and the third most represented regions of the whole sample; 6 lived in a village, 1 in a city, 3 were attending secondary school, one had graduated and one had had a master's degree.

Correlational analysis (Spearman's correlation) showed a significant negative correlation between EAT-26 and DQ and a negative correlation between the AUDIT and DQ (see Table 1 and Table 2).

Negative Spearman's correlation must be interpreted considering the difference in the scoring between the two measures, with the scores of the DQ being opposite from the two different measures. Factor analysis and Spearman's coefficient analysis were conducted to verify DQ's validity

Figure 3 – DQ results



and showed a discrete validity of the measure (see Table 3).

ANOVA showed that there were statistically significant differences related to gender at the EAT-26 and AUDIT tests, with higher means in male subjects in the AUDIT (alcohol use), and higher means in females in relation to the EAT-26 (eating attitudes).

DISCUSSION

The results of the present study show that FAD behavior was found in .85% of the sample. The FAD subsample is prevalently composed by women in relation to EDs, in line with the scientific literature and the epidemiological data, which indicate an incidence of 10:1 (women:men) in Italy (Ministero della Salute, 2020). ED patients are not exclusively women, however the prevalence in women is high. There are psychological and cultural possible explanations for this data, and biological factors could also have an impact on the tight relationship between psychopathology and its consequences for the female body.

The higher incidence of EDs in western countries could be related to the widespread presence of a stereotyped image and to the excess of consideration related to physical appearance. The predominant model, promoted by most social and cultural ways of communication, is related to physical perfection. More specifically, female body is considered desirable only in relation to impossible-to-reach standards of beauty and thinness. It is important to underline that, even if our sample was prevalently composed by women (65.5%), previous studies had enlightened how up to 70% of those who restrict food intake before drinking were women (Burke et

Figure 4 – A comparison of EAT-26, AUDIT and DQ standardized scores

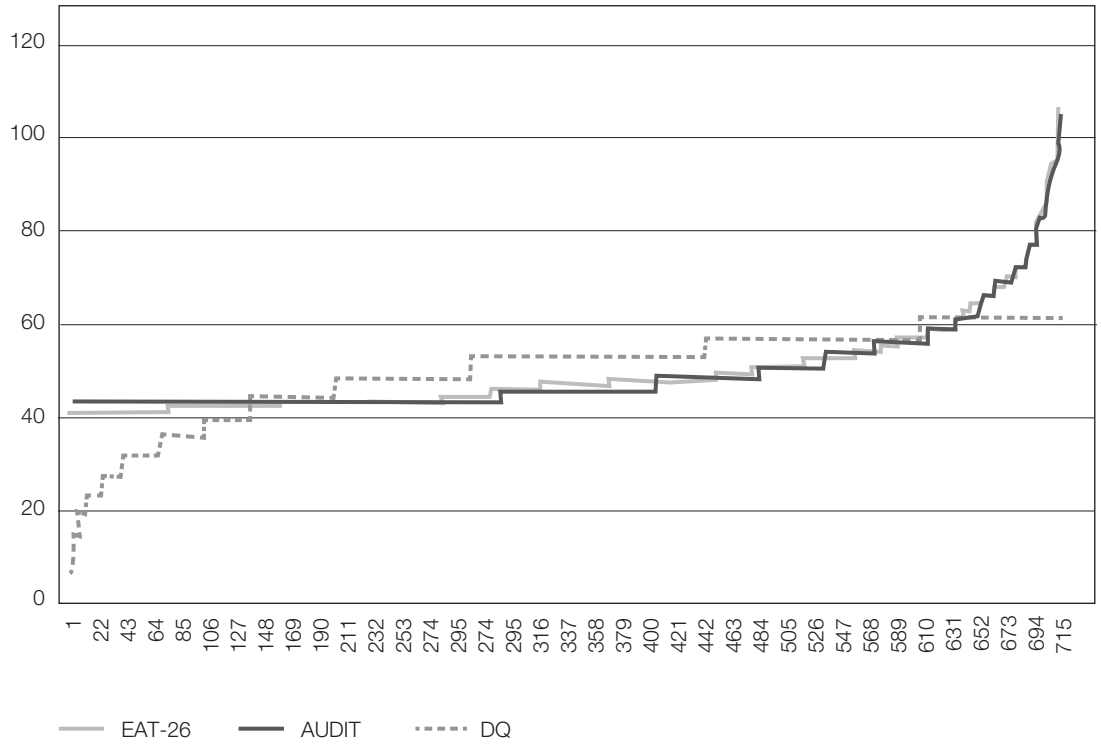


Table 1 – Correlation analysis between the EAT-26 and DQ scores

			EAT-26	DQ
Spearman's Rho	EAT-26	Correlation Coefficient	1.000	−.167**
		Sig. (2-tailed)		.000
		N	716	716
	DQ	Correlation Coefficient	−.167**	1.000
		Sig. (2-tailed)	.000	.
		N	716	716

** $p \leq .01$

Table 2 – Correlation analysis between the AUDIT and DQ scores

			AUDIT	DQ
Spearman's Rho	AUDIT	Correlation Coefficient	1.000	−.554**
		Sig.		.000
		N	716	716
	DQ	Correlation Coefficient	−.554**	1.000
		Sig. (2-code)	.000	.
		N	716	716

** $p \leq .01$

Table 3 – Factor analysis

Factor analysis – Component matrix[a]	
	Component 1
DQ 30 days	.340
DQ Food restriction	.837
DQ Compensatory behaviors	.628
DQ Physical activity	.777
Extraction method: principal component analysis.	

Legenda. [a] = 1 extracted component.

al., 2010). In 2015, Rosen and Mills (2015) found that women who restricted food intake before drinking alcohol to avoid weight gain had higher levels of EDs, while women who did not eat in order to reach faster higher levels of intoxication had more alcohol-related problematics.

Our data seem to suggest a prevalence of the phenomenon in the South of Italy and in rural areas, in which marginality and the poverty of territorial resources may contribute to the development of high-risk behaviors in young adult, as found in a study funded by the European Union on gender inequalities. The historical gap between South and North of Italy is deep and structural. There are also different geographical differences, related to rural areas and small villages and cities, which are important. In this scenario, we also must face the historical problem of the gap between the North and South of Italy. However, territorial differences can be found in the whole country. Those who are mostly affected by it are people living in the suburbs, small towns and internal rural areas, with a reciprocal influence between social and environmental problematics. Those who live in the suburbs, in rural areas or in small towns may feel like there is no future perspective for their hometowns (EEB, ENIGM, GCAP, ITALIA, 2018). There are still persistent cultural stereotypes as a consequence of a differentiated gender education, with marked inequalities and problematics for the South of Italy and the small villages.

Our study seems to suggest that an ED or an alcohol-related problematic may predict FAD behavior, as indicated also by previous studies (Pompili & Laghi, 2020). The most significant relationship was found between the FAD behavior and alcohol abuse, as found by Lupi, Martinotti and Di Giannantonio (2017) and Simons, Hansen, Simons, Hovrud and Hahn (2020). Physical activity did not seem to predict FAD behaviors, in line with previous studies on this topic (Booker, Novik, Galloway & Holmes, 2020; Palermo, Choquette, Ahlich & Rancourt, 2020) while the restriction of food intake seemed to predict FAD behaviors (Roosen & Mills, 2015).

Since 2000 alcohol abuse and EDs have been considered two of the most problematic issues in American universities, and several studies have investigated these phenomena. In 2002 O'Malley and Johnson (Kumar, O'Malley & Johnston, 2002) collected and commented data from different national surveys and studies which examined the use of alcohol in university students, such as the College Alcohol Study, the Core Institute, Monitoring the Future (an epidemiological study conducted on the basis of a research project of the institute for social research of Michigan University) and the National College Health Risk Behavior Survey. The results of the aforementioned studies showed that about 70% of university students had ingested alcohol in the previous month, and 40% reported binge drinking. In 2002 Dunn, Larimer and Neighbors found that first year university students were the most vulnerable to alcohol related problematics, particularly during the first months of university, and more recent data confirm these results (Rancourt, Ahlich, Choquette, Simon & Kelley, 2020). Predictive factors were an intensification of the academic scrupulousness in first year students, campus' social norms (which encourage alcohol use) and the lack of control from parents during college (Baer, 2002; Baer & Bray, 1999; Baer, Kivlahan & Marlatt, 1995). Anderson and colleagues (Anderson, Simmons, Martens, Ferrier & Sheehy, 2006) found that the use of alcohol and EDs in university-aged women were part of avoidant coping strategies. Other studies enlightened that a model of impulsivity/sensation seeking was highly correlated with an increased alcohol intake among students (Baer, 2002). This data was also supported by a study conducted in 2013 in the United Kingdom by da Jones, Chryssanthakis and Groom (2013). The authors used a four-factor model to investigate the relationships between alcohol intake, impulsivity, alcoholic motivations, and tendency to engage in alcohol-related problematic behaviors. Moreover, the afore mentioned study on a sample of students ranging between 18 and 25 years old showed that the feelings, the urgency and the lack of premeditations when drinking were related to different motivations, moreover there were specific associations in relation to different substances (beer, wine, liquors) and the tendency to engage in risky alcoholic related behaviors. A different study investigated the presence of EDs in American universities, by studying whether these disorders (or dysfunctional modalities adopted to control weight) were increasing during time in male and female university students. Data from three random sample survey were collected over a period of 13 years in order to study disordered eating and dysfunctional eating behaviors. Data were collected in 2008 on a sample of 641 male and female university students casually selected and were compared with 274 randomly picked university students interviewed in 2002, and with 493 students interviewed in 1995. EDs behaviors significantly increased over the years both in men and women, as did dysfunctional eating behaviors (White, Reynolds-Malear & Cordero, 2011). A 2019 study conducted

in 28 American universities showed a high risk for EDs among students. By using the Healthy Body Image (HBI) internet program, which includes an online screening to identify people who are at low or high risk or have an ED, and then suggests some possible interventions to face this risk and the related clinical problematics, the authors found out that 60% of the participants had a high ED risk or had a diagnosis of ED (Fitzsimmons-Craft, Balantekin & Eichen, 2019).

The present prospective observational study investigated a population which is larger than the ones studied in previous studies, which included only adolescents. We decided to include participants up to 40 years of age in relation to cultural differences (related mostly to the South of Italy) and to Italian socio-economic peculiarities: in Italy, for example, economic independency from the family is often reached later than in other countries because of the high unemployment rates and of the high costs of houses in most cities. The most recent Eurostat data indicate that the mean age in the European Union in which young adults leave their first home ranges between 15 and 34 years old with a mean of 26.6 years, while in Italy the mean age is 30.2. Losing their childhood certainties, the emergency of an unknown and uncontrolled situation, conforming to the group of peers, rule-breaking, rebellion, conflicts with peers, can all lead to distress and pain, especially in a critical phase of the individual development such as is adolescence, and alcohol or substance intake may be modalities through which adolescents try to cope with anxiety and painful emotions. Higher levels of socialization, transgression, being away from the family, and the "risk culture" (which explains the admiration that young people have for risky behaviors, such as drugs, substances and alcohol assumption, extreme sexual behaviors, and sensation seeking behaviors; Bastiani Pergamo & Drogo, 2012) can also affect young adults (18-20 years old) who study in universities which are distant from their hometowns. These behaviors may begin during adolescence, a period in which high risk behaviors, such as the use/abuse of alcohol (Brown et al., 2008) may be common and have a negative impact on health and, considering the socio-cultural issues enlightened above, may persist even after university.

In Italy, the first survey by Italian Ministry of Health was conducted in 2013 and found more than 300000 cases among people between 14 and 17 years old, 80% of whom were women. An Italian study carried out in 2014 on a sample of about 3000 subjects showed that this phenomenon is common among Italian young adults, with a 32.2% prevalence. Moreover, the study showed that FAD behaviors were carried out also by men and not only by women, as the media seem to suggest (Lupi et al., 2017).

The main strengths of this study are the sample size and the use of validated measures. Limitations may include the fact that part of the sample answered to the questionnaire online and not face to face, and part answered to the questionnaire in class and not alone, and this may have influenced the answers provided. Moreover, this is an unpowered study, and no power analysis was conducted, since it is a pilot study.

CONCLUSIONS

This study enlightened the need for further studies on FAD, which may be considered a construct in itself. These data call for further studies on FAD; however, at the same time, recognizing FAD as a possible nosographic construct helps at tailoring a more adapt diagnosis and treatment plan for patients affected by this condition. Moreover, further studies should try to determine the predictive factors which may play a crucial role in FAD behaviors, such as for example socio-cultural stances. The two predictive factors of FAD behaviors that emerged in this study are the presence of an ED in relation to the restriction of food intake before drinking, and alcohol abuse, with alcohol abuse having a stronger relationship (than EDs) with FAD. Recognizing these predictive factors, especially in clinical contexts by healthcare professionals, could help developing early interventions that may prevent the onset of FAD. Surveys should focus on the local differences related to these phenomena. A more detailed comprehension of FAD is advisable, and a strict definition and standardized investigation methods should be developed. Further studies are also necessary in order to be more prepared to face the onset and the short and long-term consequences of these behaviors.

The authors declare no conflict of interest.

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