



Research Article

A SCITECHNOL JOURNAL

Subject at Risk for Eating Disorders: Study of a Population of Children Aged between 8 and 13 Years

Gritti A¹, Salvati T¹, Catone G^{1,2*}, Pisano S^{1,2}, Salerno F³, Mastroianni M⁴ and Bove D^{2,4}

Abstract

Background: early onset eating disorders (EOED) are increasing. Epidemiological studies provided that the overall prevalence is estimated at around 10% in the school population. The present study aims to evaluate those at risk for EOED in a population of students from Campania Region, Italy and to identify some correlated factors associated with the disorder (BMI, age, gender, sport/activities involvement, meal-time characteristics).

Method: sample consisted of the students of the primary and secondary schools in six municipalities near the city of Caserta (Campania-Italy). Children eating attitude test-26 (Ch-EAT-26) has been used to collect data on eating disorder behaviors and attitudes.

Results: 137 subjects, 61 female and 76 male composed the sample. Mean age was 115.38 months (SD: 10.4). Mean BMI was 20 (SD: 5). The means score at the ChEAT was 13.25 (SD: 9) and 30 children exceeded the clinical cut-off score (>20). There was no correlation between ChEAT score and BMI and age. Sport/activities outside the school and key figure for the child at meal time were significantly different between the clinical and non-clinical group (Ch-EAT score).

Conclusion: data showed that our sample had a higher risk for EOED compared to the overall prevalence. Dance and physical exercise were confirmed such as risk factors for eating disorders. Finally according to the results of our research, the presence of the mother at the meal-time may be a protective factor for the risk of developing and eating disorder in childhood.

Keywords

Eating; Children; Adolescents; Early-onset; Screening

makes the diagnosis uneasy [4]. Nicholls reported that epidemiological investigation is hard to perform because patients with early onset eating disorder usually refer to pediatric divisions or psychiatric facilities [3]. The same author, in a national study conducted in England found that the overall incidence of eating disorders in the sample (208 children aged <13 years) was 3.00/100.000, and it vary by age, from 0.21/100.000 cases in the range 6-7 years to 9.51/100.000 between 12-13 years [3]. A Canadian study found that the annual incidence of restrictive early onset eating disorders in children between 5-12 years was 2.6 cases per 100.000 in the pediatric setting [5]. Screening studies on the risk for eating disorders in children under 13 years have been conducted. Ambrosi-Randic et al. [6] evaluated 1,936 Croatian female students and found that 10.3% of girls in primary schools and 7.6% in secondary schools scored positive (≥ 20) to the Children-Eating Attitude test-26 (ChEAT-26) [6]. Yueching Wong et al. [7] in a sample of 1,261 students in primary school found that 10.5% of children had a high risk for eating disorder (ChEAT-26 ≥ 20) in 10.4% of males and 10.9% of girls attending primary school. Interestingly, in this longitudinal study, after two years since the first survey, the percentage of males at risk was reduced by one point and that of females was increased by two percentage points [7].

Therefore there is some agreement between authors on the estimated risk cases that could amount to about 10% of the school population. The estimate seems reliable because the studies cited have used similar methodologies. In particular they all used the ChEAT-26 that is a good screening tool for people at risk for eating disorders [8,9]. Early identification of individuals at risk for eating disorder is extremely important for preventive and therapeutic purposes, as it has been underlined by the NICE guidelines that promote the development of research in early-onset eating disorders [10]. Furthermore, family history for eating disorders, sport or dance practice and food allergies in the child or in the parents, particularly in the mothers have been considered such as risk factors [11-15].

The prevalence of eating disorders in school children population, aged between 6-13, is quite unknown in Italy and especially in our south regions. This is due to the lack of researches on this topic. Recently a study by Cotrufo et al [16] indicated that the fourteen percent of 2925 school children, aged 11-13 year old, living in southern Italy, were at risk for an eating disorder. The research group used data from the eating disorder inventory 2 (EDI-2) [16].

Accordingly, we carried out a research study with a main and two secondary aims. The main aim was to examine those at risk for EOED in a population of students from Campania region. The hypothesis was that the number of those at risk was close to that reported from the studies reviewed in the literature. Secondly we aimed to compare subjects who screened positive with the subjects who screened negative in relation to same variables usually considered among the EOED risk factors discussed above. The hypothesis was that children who screened positive displayed more risk factors than children who screened negative. The third aim was to assess the difference between the groups with respect to an explanatory variable, identified in the presence of a familiar member at the main meal of the child. This particular interest of our research group was due to the peculiar cultural aspects at meal-time in southern Italy. In fact another risk factor for childhood eating disorders to be considered is the inappropriate

Introduction

In the last years, eating disorders with onset in adolescence and under 13 years increased [1-3]. Epidemiological data on these disorders are inadequate. The difficulty to perform epidemiological investigations for eating disorder in childhood is due to a numerous factors: e.g. the lack of well-established detection measures and the possible overlap between pediatric diseases and eating disorders which

*Corresponding author: Catone G, MD, PhD, Faculty of Education Sciences, Suor Orsola Benincasa University, Clinic of Child and adolescent neuropsychiatry, Department of Mental Health, Physical and Preventive Medicine, Second University of Naples, Naples, Italy, Tel: 081.2522251; E-mail: catoge@libero.it

Received: April 25, 2016 Accepted: June 14, 2016 Published: June 21, 2016

interaction of mother and other family members with the child, at mealtime. It is well documented that in children with eating disorders the mother-son feeding relationship may be dysfunctional and that parental feeding practices (e.g. over controlling or forcing to eating), predicts childhood food refusal [17]. The role of the grandparents within the context of feeding practices is another important variable. Farrow et al. [18] show that the attitudes of grandparents in feeding their grandson may model either adaptive or disadaptive children's eating behaviors [18].

Materials and Methods

The sample was taken from a population of children attending primary and secondary schools in six municipalities near the city of Caserta (Caiazzo, Piana di Monte Verna, Ruviano, Castel Campagnano, Alvignano, Dragoni, Maiorano). This population was representative of a homogeneous culturally and socio-economic non-urban area, with the prevalence of the population employed in the service sector. The study was conducted in the period from January 2014 to June 2014. For the purposes of the study, children (over the age of 8 years) of the last two classes of primary schools and all classes of the middle school, involved in the study, were all enrolled. The total number of eligible subjects was 277 subjects (146 M; 131 F). Parents of the candidates in the study were informed of the aims and method of the research; those who agreed to participate were asked to sign a written informed consent. School administrators authorized the study.

Socio-demographics and clinical data were collected through a structured interview with the parents aimed at filling out age, gender and the following variables: BMI (calculated by pediatrician), child or family member's food intolerance, presence of eating disorder in the family, presence/absence of the caregiver or other familiar at the main meal time. Extra-curricular activities were assessed by the question: "do your child practice any sport or dance?" and we considered the reply positive if parents ensured adequate activity duration (6 months) and a frequency of at least twice a week. Alternatively children were grouped in the category "sedentary activities" which included spending time at computer, TV.

For eating disorder behaviors and attitudes, It was adopted a standardized, self-administered tool, the Children-Eating Attitude test (Ch-EAT), the version of EAT 26 (reduced form of EAT) [19], used for subject under the age of 14. The Ch-EAT consists of 26 questions with a clinical cut-off equal to 20 points [8]. The test is easy, brief and it has been validated in the Italian population [20]. The questionnaire was administered collectively.

Exclusion criteria from the study were: students with special education needs and certified intellectual disabilities both with inability to complete the questionnaire. Subjects whose parents did not give their consent to participate. The study was approved from the ethical committee of the FUSIS association-Alvignano.

The sample was divided in two subgroups according to the Ch-EAT score: A) group with clinical score ≥ 20 ; B) group with non-clinical score ≤ 19 . The two subgroups were compared later with regard to the different variables identified.

Statistical Analysis

The data were analyzed using the statistical Package for the Social Sciences (version 19 for windows). Descriptive statistics including

means with standard deviations or frequencies with percentages were used to investigate patient demographics. Two correlation analyses (Pearson correlation test) were performed between Ch-EAT score and BMI, and Ch-EAT score and age of respondents. The chi square test (for categorical variables) and T-Test (for numerical variables) were used to compare the two subgroups (according the Ch-EAT score) relatively to the variables listed above.

Results

144 of 277 subjects were excluded from the study for various reasons (53 parents who have not provided consent, 64 incomplete ChEAT, 19 incomplete socio-demographical forms, 4 lost). The sample (Table 1) was composed by 137 subjects (49% of the sample recruited), 61 female and 76 male. Mean age was 115,38 months (SD: 10,4). Mean BMI was 20 (SD: 5). The means score at the ChEAT was 13.25 (SD: 9) and 30 children exceeded the clinical cut-off score (>20). 31 subjects (22.4%) were in a state of underweight (BMI <18) at the time of observation, 78 subjects (57.2%) in a condition of normal weight (BMI 18-25), and 28 subjects (20.4%) with weight above normal (BMI >25). 6 children (4.35%) and 17 family members (12.31%) had suffered from food intolerance. Only 5 cases (4%) reported the presence of eating disorder in the family.

The comparison between the clinical (ChEAT >20) and the non-clinical group (ChEAT <20) was showed in Table 2. Data did not show any significant differences in relation to the variable: gender, age, BMI, presences of food allergies in the child and in the child's family and eating disorders in the family. However there was a significant difference between the two subgroups in relation to sport/activities outside the school and key figure for the child at meal time. Specifically, subjects engaged in sports and/or dance got a ChEAT score higher than subjects who are not involved in these activities. Individual living in household where there are multiple family members at mealtime (1 or 2 parents and grandparents) had more ChEAT clinical scores than those who had the meal with 1 or both parents only. In particular children with the mother alone at the mealtime had a very low frequency of ChEAT clinical scores. There were no correlations between ChEAT score and BMI and age.

Discussion

Overall, the data showed that our sample had a higher risk for EOED compared to the expected results. In fact, the given percentage was greater than that reported in literature. The number of subjects at risk for eating disorders in our sample was 21.8% compared with the 10% reported in the literature and with the 14% reported by Cotrufo [16]. Despite this figure cannot be compared with estimates of the Campania region or national estimates, this is one of the first study on childhood eating disorder in a substantial sample conducted in

Table: 1 Demographic data.

| Demographic data | Frequencies (%) | Mean (standard deviation) |
|-------------------------|---|----------------------------|
| Sex | F: 61 (44.5) M: 76 (55.4) | |
| Age | | 9 years, 7 months \pm 10 |
| BMI | 31 <18 (22.6) 78 18-25 (56.9) 28 >25 (20.4) | 19.68 \pm 33 |
| Food allergies | yes: 6 (4,3) no: 131 (95,6) | |
| familiar food allergies | yes:17 (12,31) no: 120 (87.6) | |

Table 2: comparing the group with score lower than 20 on Ch-EAT, and the group with a score greater than 20 on the Ch-EAT.

| | ChEat \geq 20 | ChEat \leq 20 | p |
|---|--|---|---------|
| N | 30 (21.8%) | 107 (78.1%) | |
| Sex | F: 13 (43.3%); M:17 (56.6%) | F: 48 (44.8%); M:59 (55.1%) | 0.88 |
| Age | 116.62 \pm 8.15 | 115.09 \pm 11 | 0.48 |
| BMI | 20 \pm 5.36 | 19 \pm 5.32 | 0.39 |
| Food allergies | yes: 0 (0%); no: 30 (100%) | yes: 6 (5.6%); no: 101 (94.3%) | 0.41 |
| familiar food allergies | yes: 2 (6.6%); no:20 (66.6%); missed: 8 (26.6%) | yes: 15 (14.0%); no: 73: (68.2%); missed: 19 (17.7%) | 0.55 |
| Eating disorders in family | yes:2 (6.6%); no:19 (63.3%); missed: 9 (30%) | yes: 3 (2.8%); no:83 (77.57%); missed: 21 (19.6) | 0.55 |
| extracurricular activities | no:1 (3.3%) sedentary activities:2 (6.6%) dance:3 (10%) sport:16 (53.3%) missed: 8 (26.6%) | None:32 (29.9%) sedentary activities:3 (2.8%) dance:7 (6.5%) sport:43 (40.1%) missed: 22 (20.56) | 0.02* |
| Ratio no activity,/activity | 3/19 (10%/63.3%) | 35/50 (32.7%/46.7%) | 0.03* |
| Family at the mealtime | mother:1 (3.3%) father:0 (0%) mother and father: 2 (6.6%) more relatives:11 (36.6%) missed: 16 (53.3%) | mother: 44 (41.1%) father: 2 (1.8%) mother and father:17 (15.8%) more relatives:26 (24.2%) missed: 18 (16.8%) | 0.0034* |
| Ratio only parents/parents plus other relatives at mealtime | 3/11 (10%/36.6%) | 63/26 (58.8%/24.2%) | 0.0003* |

Campania. Another noteworthy result regarded the percentage rate of overweight patients, in our sample it was lower, more than ten points, compared to that observed in Campania child population [21]. The detection of cases of obesity was beyond the scope of our work. Despite this, we outlined this result. The hypotheses that factors such as the presence of personal or family food intolerances and familiarity for eating disorder were higher in subjects at risk for eating disorders were not confirmed; furthermore age of respondents and BMI did not correlate with Ch-EAT score. Our main result was the higher frequency of sports and dance among individuals at risk for EOED, in fact in the group with Ch-EAT score \geq 20, the involvement in extracurricular activities (dance, sports) was significantly higher than in the group with Ch-EAT score $<$ 19, and these data were consistent to those reported in literature that considered the involvement in physical activities and sports a well-recognized risk factors for ED [22]. The results about the relationship between the presence of family members at mealtime and the risk for eating disorders were of particular interest. In our sample no child left home alone at the mealtime, but at least one family member was present. This was not unusual as the Campania cultural background brings the family together for the meal. Children who were cared by the mother alone at the mealtime were at lower risk for eating disorder that those cared by the extended kinship that included grandparents. It was not easy to interpret this result. We suggest the hypothesis that some unknown factors, related to the presence of many family members at mealtime could generate disturbed eating behavior in children, in particular differences or conflicts between the parents and grandparents feeding practices. The support for this hypothesis comes from literature; Farrow C has found that grandparents may use significantly more maladaptive feeding practices with negative impact on child feeding behavior [18]. Finally the participation data of parents in the study was satisfactory, taking into account the difficulties in carrying out epidemiological researches in schools of Campania region, as we pointed out in our previous study [23]. Anyway, the study is not free of important limitations. First, being a cross-sectional study we cannot ascertain whether factors we found more associated with the risk for eating disorders will then cause a full blown of such disorder. Longitudinal studies are needed to this purpose. Second, we did not assess other psychological (e.g. self-image) or psychopathological (e.g. anxiety, depression) variables that can be associated to the risk for eating disorders.

Conclusion

The study provided data on the magnitude of the risk for eating disorders in a child population in are of the Campania region. This area was representative of a homogeneous socio-cultural context. In the absence of previous regional epidemiological studies, this research appeared to be the first on this topic. The presence of a higher risk for eating disorder compared to those described in the literature should be confirmed by further studies on a larger population. Dance and physical exercise were confirmed such as risk factors for eating disorders. Finally according to the results of our research, the presence of the mother at the meal time may be a protective factor for the risk of developing and eating disorder in childhood.

Author Declaration

The authors declare that they have no competing interests.

AG conceived the study and drafted the manuscript. TS carried out the data collection and statistical analyses. GC drafted the paper and carried out statistical analyses. SP participated in the design of the study and drafted the paper. FS participated in the design of the study and helped to draft the manuscript, MM participated in the design of the study and carried out the data collection, DB conceived and coordinates the study. All authors read and approved the final manuscript."

All authors would acknowledge staff and pupils of the schools that participated in the study.

In collaboration with the eating disorder research group, University "Suor Orsola Benincasa", Naples.

References

- Favaro A, Caregaro L, Tenconi E, Bosello R, Santonastaso P (2009) Time trends in age at onset of anorexia nervosa and bulimia nervosa. *J Clin Psychiatry* 70: 1715-1721.
- Smink FR, Van Hoeken D, Hoek HW (2012) Epidemiology of eating disorders: incidence, prevalence and mortality rates. *Curr Psychiatry Rep* 14: 406-414.
- Nicholls DE, Lynn R, Viner RM (2011) Childhood eating disorders: British national surveillance study. *Br J Psychiatry* 198: 295-301.
- Lask B, Bryant-Waugh R (1992) Early-onset anorexia nervosa and related eating disorders. *J Child Psychol Psychiatry* 33: 281-300.
- Pinhas L, Morris A, Crosby RD, Katzman DK (2011) Incidence and age-specific presentation of restrictive eating disorders in children: a Canadian Paediatric Surveillance Program study. *Arch Pediatr Adolesc Med* 165: 895-899.

6. Ambrosi-Randic N, Pokrajac-Bulian A (2005) Psychometric properties of the eating attitudes test and children's eating attitudes test in Croatia. *Eat Weight Disord* 10: 76-82.
7. Yueching Wong RD, Yu-Jhen Chang RD, Tsao SW (2014) Disturbed eating tendency and related factors in grade four to six elementary school students in Taiwan. *Asia Pac J Clin Nutr* 23: 112-120.
8. Smolak L, Levine MP (1994) Psychometric properties of the Children's Eating Attitudes Test. *Int J Eat Disord* 16: 275-282.
9. Maloney MJ, McGuire JB, Daniels SR (1988) Reliability testing of a children's version of the Eating Attitude Test. *J Am Acad Child Adolesc Psychiatry* 27: 541-543.
10. Wilson GT, Shafran R (2005) Eating disorders guidelines from NICE. *Lancet* 365: 79-81.
11. Bould H, Koupil I, Dalman C, DeStavola B, Lewis G, et al. (2015) Parental mental illness and eating disorders in offspring. *Int J Eat Disord* 48: 383-391.
12. Bould H, Sovio U, Koupil I, Dalman C, Micali N, et al. (2015) Do eating disorders in parents predict eating disorders in children? Evidence from a Swedish cohort. *Acta Psychiatr Scand* 132: 51-59.
13. Arcelus J, Witcomb GL, Mitchell A (2014) Prevalence of eating disorders amongst dancers: a systemic review and meta-analysis. *Eur Eat Disord Rev* 22: 92-101.
14. Shanahan L, Zucker N, Copeland WE, Costello EJ, Angold A (2014) Are children and adolescents with food allergies at increased risk for psychopathology? *J Psychosom Res* 77: 468-473.
15. Watkins B, Cooper PJ, Lask B (2012) History of eating disorder in mothers of children with early onset eating disorder or disturbance. *Eur Eat Disord Rev* 20: 121-125.
16. Cotrufo P, Cella S, Cremato F, Labella AG (2007) Eating disorder attitude and abnormal eating behaviours in a sample of 11-13-year-old school children: The role of pubertal body transformation. *Eat Weight Disord* 12: 154-160.
17. Chatoor I, Hirsch R, Ganiban J, Persinger M, Hamburger E (1998) Diagnosing infantile anorexia: the observation of mother-infant interactions. *J Am Acad Child Adolesc Psychiatry* 37: 959-967.
18. Farrow C (2014) A comparison between the feeding practices of parents and grandparents. *Eat Behav* 15: 339-342.
19. Garner DM, Olmsted MP, Bohr Y, Garfinkel PE (1982) The eating attitudes test: psychometric features and clinical correlates. *Psychol Med* 12: 871-878.
20. Laudadio A, Huober N, Di Gianfrancesco R, D'Alessio M (2010) Italian validation of chEAT with pre-adolescents: attitude towards the own weight. *Psicologia clinica dello sviluppo* 14: 299-324.
21. Contaldo F, Mazzarella G, Santaripa L, Marra M, Pasanisi F, et al. (2015) Influence of urbanization on childhood obesity. *Nutr Metab Cardiovasc Dis* 25: 615-616.
22. Stice E (2002) Risk and maintenance factors for eating pathology: a meta-analytic review. *Psychol Bull* 128: 825-848.
23. Gritti A, Bravaccio C, Signoriello S, Salerno F, Pisano S, Catone G, et al. (2014) Epidemiological study on behavioural and emotional problems in developmental age: prevalence in a sample of Italian children, based on parent and teacher reports. *Ital J Pediatr* 40: 1-7.

Author Affiliation

Top

¹Faculty of Education Sciences, Suor Orsola Benincasa University, Naples, Italy

²Clinic of Child and adolescent neuropsychiatry, Department of Mental Health, Physical and Preventive Medicine, Second University of Naples, Naples, Italy

³Complex Unity of Child and Adolescent Psychiatry, Care Department of Internal and Specialist Medicine, Italy

⁴Fusis Association for Research on Child and Adolescent Neuropsychiatry, Alvignano (CE), Italy

Submit your next manuscript and get advantages of SciTechnol submissions

- ❖ 50 Journals
- ❖ 21 Day rapid review process
- ❖ 1000 Editorial team
- ❖ 2 Million readers
- ❖ Publication immediately after acceptance
- ❖ Quality and quick editorial, review processing

Submit your next manuscript at • www.scitechnol.com/submission