# Disordered eating: the young male side

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## DISCLOSURE

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**ABSTRACT**

Disordered eating (DE) is known to predominate among girls, and historically studies have focused primarily on them. This cross-sectional study aimed to investigate the characteristics of adolescent and young adult males at risk of DE. Participants (N=2269; 15-24 years) in a study assessing their lifestyle were divided into two groups based on the SCOFF five-question screening tool: a SCOFF[+] group for participants at risk of disordered eating, and a SCOFF[-] group for everyone else. SCOFF[+] participants were more likely to be overweight and obese; have a lower socio-economic status and non-Swiss parents; experience weight issues; and report a chronic condition, poorer emotional well-being and a less positive attitude towards life. With 10% of males at risk of DE, clinicians should be aware of their specific characteristics, which should be considered red flags. DE is no longer a female-specific issue.

**Keywords.** male; disordered eating; adolescent; young adult; Switzerland; cross-sectional study

## INTRODUCTION

There is a rising incidence of eating disorders (EDs) during adolescence. A study in six European countries analyzing lifetime ED prevalence showed that the majority of cases started between ten and twenty years of age [1]. ED cover a range of serious disturbances in eating habits or weight-control behavior [2], which are complex issues linked to predisposing biological, psychological and social factors. Various hypotheses influencing the onset of EDs during adolescence have been suggested, such as: an increase of adipose tissue in girls, the importance of peer influence on body image, exposure to media-idealized images[3], and difficulty in achieving independence from parents [4].

EDs are known to predominate among girls, and historically studies have focused primarily on them. However, research is increasing among males in the light of growing awareness that they, too, suffer from this condition. The usually accepted male vs. female ratio of 1:10 among adults shows fewer disparities among adolescents [5]. In fact, the gender ratio seems to be an increasing function of age as it is 1:4 in childhood (5-13 years) [6]. Moreover, EDs are even less sex-specific when partial eating disorders are included [7]. Depending on age and the criteria used, ED prevalence among males varies greatly from 0.5% to 16.6% [8,9].

Males find it difficult to identify themselves as having an ED and are reluctant to see their doctor because of the associated gender stereotype of an illness affecting only females [10-13]. Since they are under-diagnosed, the prevalence among males is likely underestimated [14]. There is a need to improve detection of ED in males and increase awareness among healthcare providers [10].

Recently, studies on ED exclusively focusing on males have increased and included larger sample sizes than previously [15]. Indeed, different aspects of ED among males are being

analyzed, for example forecasting biological, social and individual factors associated with the onset[16] and persistence of ED[17], prevalence of each type of ED among males with the introduction of DSM-5[18], and behavioral symptoms associated with ED[19,20]. Nevertheless, there are few studies specifically concerned with adolescent and young adult (AYA) males.

One of these studies analyzed disordered eating among adolescent males in Switzerland [21]: they were more likely to be overweight or obese, to report depression, and to have a history of sexual or physical abuse and delinquent behavior. In this paper we will take the research of Dominé et al. [21] a step further by assessing associations with socioeconomic status, self-perceived school performance, and the relationship with both parents.

The link between EDs and socioeconomic status is unclear in the literature with some research indicating that EDs are more common in higher income levels for males and in both the highest and lowest for females [22]. Others [23] report overall that EDs are more frequent in the lowest income quarter.

The association between ED and school performance is also unclear. Some authors [22] report lower academic achievement in both genders, while others describe it mainly among girls [24,25]. The literature on the influence of the parent-adolescent relationship on ED is scarce. Krug et al. found that low parental warmth was associated with EDs in girls but not in boys, while Berge et al. [26] concluded that higher family functioning and parental connection were protective factors against ED.

Disordered eating and EDs result from a complex interaction of biological processes, sociocultural factors, and psychological and individual traits like low self-esteem, perfectionism and negative affect [27,28]. Other evidence suggests that the life context of AYAs, be it the family or scholastic environment, might act as a potential correlate of disordered eating [29,30].

The timing of pubertal transition has been included as a variable in this study because it is known to have an impact on social development and psychological adjustment among adolescents[31]. There is evidence that pubertal timing affects females and males in different ways[32]. Early-maturing females are more likely to be depressed and tend to be less popular with peers [33]. In contrast, early-maturing males are viewed as more attractive and demonstrate higher level of body satisfaction [34].

Most studies analyze boys suffering from ED through the prism of girls with EDs, which implies that both genders present the same symptoms. However, males seem to present different criteria regarding EDs. Body concern among adolescent males tends to focus more on muscularity than on a drive for thinness, which is characteristic among girls [35,36]. Males before obvious signs of ED tend to be overweight, which clinicians can overlook as a sign of being at risk [36,37]. In fact, males can be motivated to lose weight and increase muscle mass to achieve their ideal body: large chest and shoulders and a slim waist [14,38]. Although some studies show that athletes of both genders are at risk of ED, male athletes are more likely to exhibit disturbed eating at sub-threshold diagnostic levels[39].

Early detection of disturbed eating is important. Treatment tends to be more successful when initiated early and while preventing harmful consequences in the long run [40]. For that reason, being aware of the distinguishing characteristics of males who are at risk of developing disordered eating could help clinicians identify them and offer a targeted prevention. The aim of this study is to describe the characteristics of males at risk of disordered eating while controlling for potential confounding factors.

**METHODS**

Data were drawn from the baseline wave of the GenerationFRee study which aims to assess the lifestyles of AYAs in the canton of Fribourg, Switzerland. Data used for this study were collected during the 2014-2015 school year. AYAs in the canton's eleven post-mandatory schools (five high schools and six professional schools) completed an anonymous Web-based self-administrated questionnaire. The mandatory school age in Switzerland is 15; afterwards, about one third of adolescents follow high school and two thirds vocational training. The latter are enrolled by companies to train for their future profession and attend classes at vocational school 1-2 days a week. Questionnaires were filled in online in the schools' computer facility.

Out of 5 834 AYAs, 200 were unwilling to participate, 211 were not in the target age group, and 244 failed to complete the questionnaire reliably and were thus excluded. The final sample consisted of 5 179 AYAs of which only male respondents were included in the analysis (n= 2 269).

Dependent variable

We divided the surveyed males into two groups using the SCOFF questionnaire, a validated screening tool for identifying subjects at-risk of disordered eating [41]. The five items of the questionnaire (*Do you make yourself sick because you feel uncomfortably full? / Do you worry you have lost control over how much you eat? / Have you recently lost more than 14 pounds in a three-month period? / Do you believe yourself to be fat when others say you are too thin? / Would you say that food dominates your life?*) are each answered as "yes" or "no". The cut-off point for the SCOFF is set at two or more positive answers, with a sensitivity of 85% and a specificity of 90%. Regarding eating disorders, the SCOFF is excellent at detecting all true cases of anorexia nervosa and bulimia nervosa and most cases of eating disorders not otherwise

specified (EDNOS) [41]. The SCOFF questionnaire has been translated into French and validated among adolescents [42].

We included subjects who answered positively to at least two of the five questions in the group with a positive SCOFF (SCOFF[+]; n=230, 10.1%). Participants with one or no positive answers formed the group with a negative SCOFF (SCOFF[-]; n=2 039, 89.9%).

Independent variables

Personal variables included age, height, weight, pubertal timing, AYA's birthplace (Switzerland/abroad), and residence (urban/rural).

BMI was calculated from self-reported height and weight and we used the cut-offs for underweight, overweight and obesity defined by Cole et al. [43,44]. Self-assessment of pubertal timing was determined by the question "If you think about the age you began puberty, compared with your same age peers, would you say that you were…" trichotomized into 'early pubertal timing', 'average pubertal timing' and 'late pubertal timing'. This method has been shown to be a valid approximation to pubertal timing with a 94% correlation with physician evaluations [45].

Family variables included family structure (parents living together or not), parents' birthplace (at least one born in Switzerland/both abroad), socioeconomic status (SES), and mother-AYA and father-AYA relationship, which is a good indicator of adolescent functioning[46].

Self-assessment of SES was determined by the question used in the ESPAD project [47]: "Compared to the financial situation of other families in Switzerland, would you say that your family is…" with seven possible answers ranging from 'very well below average' to 'very well above average' and trichotomized into 'above average', 'average' and 'below average'. Father and mother relationship with the AYA were rated on a scale from 1 [very poor] to 10 [excellent].

School variables included academic track (student/apprentice) and self-reported school performance (above average, average or below average).

We controlled for variables likely to have a relationship with disordered eating such as the average weekly number of days of physical activity lasting a minimum of 60 minutes, having faced weight issues the past year, having a chronic condition (disability or chronic disease) [48], emotional well-being [49], self-reported health (good/poor) [50] and positive attitude towards life.

To measure emotional well-being we used the WHO-Five Well-Being Index (WHO-5), whose validity in adolescents has been proved [51]. The WHO-5 index includes five items and each one is rated on a six-point Likert scale ranging from 0 (at no time) to 5 (all of the time) [52]. Scores are added and a result below 13/25 indicates poor well-being. Cronbach's alpha in the present study was .81. We measured their vision of the future using the Positive attitude to life scale, which includes six items ranging from 1 (absolutely untrue) to 6 (absolutely true), a higher score meaning that they had a more positive attitude to life [53]. Cronbach's alpha in the present study was .87.

The study protocol was approved by the Ethics Committee of the canton of Vaud.

Statistical analyses were performed with STATA 13.0 (StataCorp, College Station, Texas). In a first step, we used the Chi-square test and Student's t-test to compare categorical and continuous variables between the two groups. Results are given as point prevalence and means. In a second step, all statistically significant variables ($p<0.05$) at the bivariate level were included in a backward logistic regression analysis. Because the SCOFF and the variable "weight issues during the past year" might interact with each other, we reran the analysis without the variable "weight issue during the past year". However, the results did not change significantly (data not shown). To avoid setting aside potentially important variables that could interact with

others, we also tried to include in the regression model variables significant at the 10% level at the bivariate level, but again without there being any change. Finally, the specification of the final multivariate model was checked using the linktest, but no problem was found. Results are given as adjusted odds ratio (aOR) with 95% confidence intervals (95%CI).

**RESULTS**

At the bivariate level AYAs at risk of disordered eating were significantly more likely to be overweight or obese, to report early pubertal timing, to be born abroad and to have a low socio-economic status. Regarding family-related variables, SCOFF[+] males were significantly more likely to have non-Swiss-born parents not living together, and to have a poorer relationship both with their father and their mother. Considering health-related variables, SCOFF[+] males were significantly more likely to report poor health, to have faced weight issues during the past year, and to have a chronic condition, poor emotional wellbeing and a less positive attitude towards life (Table 1).

The results of the backward logistic regression are reported in Table 2. After controlling for confounding factors and comparing to the control group, SCOFF[+] males were more likely to be overweight (aOR: 2.58 [1.78:3.75]) or obese (aOR: 3.12 [1.70:5.71]). For their social background, SCOFF[+] males were more likely to have a lower socio-economic status (aOR: 2.20 [1.39:3.48]) and non-Swiss parents (aOR: 1.66 [1.19:2.31]). They were also more likely to have faced weight issues during the past year (aOR: 5.79 [2.98:11.27], and to report a chronic condition (aOR: 1.63 [1.11:2.40]), poorer emotional well-being (aOR: 1.79 [1.19:2.69]) and a less positive attitude towards life (aOR: 0.95 [0.93:0.98]).

**DISCUSSION**

Overall 10% of our sample was at risk of disordered eating. They were more likely to be overweight or obese, to be of lower socio-economic status, to have both parents of foreign origin, to suffer from a chronic condition and to have a less positive attitude towards life.

Dominé et al.[21] had also found an association between unhealthy eating behaviors and overweight or obesity among males. The reverse is also true as overweight youth have an increased risk for disordered eating behaviors. Indeed, dieting, for example, is a common risk factor for overweight and ED, as it might trigger a cycle of restriction and overeating, thus possibly leading to binge eating and weight gain [54]. Increased body mass contributes to body dissatisfaction for not fitting with the leanness ideal, which in turn is a risk factor for eating pathology [55-57].

Regarding associations between SES and disordered eating, the literature is inconclusive, especially for males[58]. Nevertheless, the link between low socio-economic status and overweight/obesity has been well established in numerous studies even though the underlying mechanisms are still not well understood [59]. We can hypothesize that eating healthily is more financially demanding but also needs nutrition knowledge and time for cooking, which can be lacking when both parents work [60]. Overweight/obesity and their psychosocial consequences such as peer teasing and repetitive dieting are known risk factors for disordered eating [3,19,54,61]. Moreover, the dysfunctional family environment often observed in low-income households might lead to chaotic behaviors, among them disordered eating [62]. Further research is required to assess the link between socio-economic status and disordered eating, especially among males.

Our results also demonstrate that SCOFF[+] males were more likely to self-report early puberty. There is a controversy in the literature regarding whether early or late puberty among males is associated with disordered eating, highlighting the need for further research [4,63].

Interestingly, Dominé et al.[21] also found an association between early puberty and disordered eating behaviors or concerns. Psychological mechanisms could account in this study for the relationship between early puberty and disordered eating. Differing development among males might foster feelings of alienation, especially during a development phase where comparison to peers is a major concern. More important still, experiencing puberty before peers might lead to greater psychological disturbance: early maturing males are less likely to be prepared to face bodily changes and might focus more on their body. While females move further away from the thinness ideal with pubertal development, males tend to move closer to the male ideal of acquiring muscular mass and developing wider shoulders. McCabe showed in her study that females experienced more body dissatisfaction with an increase in body fat linked to puberty and tended to adopt strategies to reduce weight[64]. For adolescent males in the study however, pubertal changes led to an increased use of strategies to enhance muscle tone, which in turn was associated with greater anxiety[64]. Therefore it seems that a different mechanism underlies the association of pubertal timing and puberty onset with disordered eating pathology between females and males.

The risk of disordered eating was significantly more predominant among males with foreign-born parents. Regarding ethnicity, the literature highlights an emergence of disordered eating in non-Western cultures [65]. Furthermore, some authors demonstrated an association between culture change and disordered eating that depends on the studied group [66]. A possible explanation is that children of foreign-born parents grow up between two different cultures and thus can feel torn between original and local values. Disordered eating can be a way to cope with the identity issues related to the culture shock. However, this cultural turmoil may express itself in a different manner. Some cultures look at overweight or obesity positively as a sign of wealth,

preferring a larger body size. A possible explanation is that, when confronted with local body standards, AYAs of foreign-born parents might experience conflicting expectations, possibly leading to eating disorders.

We also found that SCOFF[+] males were more likely to have a chronic condition. Chronic conditions that require dietary management like diabetes or cystic fibrosis might increase preoccupation with food. Moreover, physical stigma due to illness or treatment can foster body dissatisfaction, a risk factor of disordered eating[48]. AYAs suffering from a chronic condition are striving to be like their healthy peers and report lower self-esteem[67]. Disordered eating may be a functional response to confronting an identity crisis.

Research focusing on the relationship between disordered eating and attitude towards life is rare. In this study, SCOFF[+] males reported a less positive attitude towards life. The thoughts of disordered eating subjects revolve mostly around food and weight, thus not leaving much room for other concerns. Disordered eating might thus serve to mask existential concerns related to purpose in life and self-identity. Furthermore, depression is a common psychiatric comorbidity in patients with an eating pathology that is associated with feelings of hopelessness and worthlessness which darken one's future [68,69].

As expected, our results showed that SCOFF[+] males faced weight issues during the past year. This concurs with the SCOFF evaluation, thus underscoring its relevance. Additionally, in line with earlier studies, we found that SCOFF[+] males had a reduced emotional well-being [70].

The main strengths of this study are that it is based on a large representative sample of AYAs in post-mandatory education and that it focuses exclusively on males. However, there are also some limitations. First, because of the study's cross-sectional design no causal relationship

can be drawn. Second, as the survey results are based on self-reported questionnaire responses, bias cannot be excluded. Regarding weight status in particular, overweight or obese youth tend to underestimate their actual weight [71], which could lead to our underestimating results (although use of anonymous data collection should have minimized this problem). Third, an important limitation of the body mass index (BMI) should be considered. Indeed, it does not distinguish between body fat, muscle mass or bone density. SCOFF[+] males considered as overweight or obese in terms of their BMI could in fact be muscular. That possibility would correspond to the muscularity concern common to males. Fourth, the GenerationFRee study did not include more specific male assessment such as a drive for muscularity that could have improved the present analysis [72]. However, the initial aim of the GenerationFRee study was to focus on AYAs' lifestyle independently of gender. Fifth, the study did not assess disordered eating oriented toward gaining muscularity rather than losing body fat (termed muscularity-oriented disordered eating), although, at present, there is no validated and published scale that assesses this construct[73]. Sixth, the SCOFF questionnaire is only a screening tool for disordered eating and cannot replace a clinician's diagnosis. However, the SCOFF questionnaire has a high sensitivity with few false positives [41].

Given the public health significance of disordered eating, further research specifically focused on males is warranted to better define their characteristics. Furthermore, the success of enhanced eating disorder prevention depends on longitudinal data to understand the risk factors of disordered eating among males.

## CONCLUSIONS

Based on this study's results, 10% of young males are at risk of disordered eating. This finding provides further evidence suggesting that disordered eating is no longer a specific female

issue (even though females in our study report a much higher rate, 31% [data not shown]) and tends to affect males too. Besides, although males show some similarities with females at risk of disordered eating, they also present important differences. Therefore, looking at males through a female prism (academic overachievers, higher socioeconomic status) would be much too restrictive. From a clinical standpoint, it is important for practitioners to consider the specificities of males at risk of disordered eating, especially overweight and obesity. Healthcare providers should bear in mind these characteristics when consulting with AYA males and should be encouraged to discuss disordered eating with them.

## DISCLOSURE

**Conflicts of Interest.** The authors declare no conflict of interest.

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## AUTHOR CONTRIBUTIONS

Sabine Ammann analyzed and interpreted the data, drafted and revised the manuscript, and approved the final version of the manuscript as submitted.

André Berchtold conceptualized and designed the study, obtained funding, analyzed and interpreted the data, critically revised the manuscript, and approved the final version of the manuscript as submitted.

Yara Barrense-Dias conceptualized and designed the study, coordinated data collection, critically revised the manuscript, and approved the final version of the manuscript as submitted.

Christina Akré conceptualized and designed the study, coordinated data collection, critically revised the manuscript, and approved the final version of the manuscript as submitted.

Joan-Carles Surís conceptualized and designed the study, obtained funding, acquired, analyzed and interpreted the data, critically revised the manuscript, and approved the final version of the manuscript as submitted.

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