

Comparison between SCOFF and EAT-26: an Italian Study on Young Female Adults

A. Chinello^{1,*}, G. Corlazzoli², R.S. Scuotto³, S. Cadeo¹, L.E. Zappa¹, and P. Ricciardelli^{3,4}

¹18.56 Monitor Lab, Maria Bianca Corno Foundation, via Zucchi 1, Monza, Italy

²Center for Research in Cognition and Neurosciences (CRCN) – Université Libre de Bruxelles (ULB), 50 avenue F.D. Roosevelt, Brussels, Belgium

³Department of Psychology, University of Milano-Bicocca, Piazza dell'Ateneo Nuovo 1, Milan, Italy

⁴NeuroMI: Milan Center for Neuroscience, Piazza dell'Ateneo Nuovo 1, Milan, Italy

Abstract: Early screening for eating disorders often occurs in primary care or in non-psychiatric settings by using rapid and easy questionnaires, such as EAT-26 and the SCOFF. Here, the study compares the Italian translations of SCOFF and EAT-26 to confirm their screening validity and risk distribution in a non-clinical sample composed by young women (aged 18-30 years).

Our findings show a strong risk correlation between the two tools, with frequent and overlapped questions exploring similar constructs. However, mismatching results regarding the detection of clinical risk for eating disorders involve about a quarter of the sample, mostly due to their internal specificity/sensitivity, translation discrepancies, tool training and use modality.

In general, both screening tools are reliable for EDs detection in the general population. In the case of EAT-26, the combined use of both questionnaires improve robustly the risk detection (+23%) for eating disorders in young female adults, especially in universities and work places adopting an online administration. Further studies may occur to better understand the specific factors influencing mismatching results, in terms of EDs risk, between the two questionnaires.

Keywords: Eating disorders, Screening, Anorexia, Bulimia, Risk.

INTRODUCTION

Eating disorders (EDs) are severe psychiatric disorders with critical, medical, and psychological consequences, more prevalent in young females living in Western societies. The ED aetiology is influenced by a myriad of variables, consisting in biological, psychological and social factors. Body dissatisfaction, ego deficits, preoccupation with food, weight and shape represents the core symptoms of anorexia (AN) and bulimia nervosa (BN), considered as a common pathological spectrum [1] with different manifestations. AN patients exhibit a reduction of body weight with severe dietary restrictions, an intense fear of fatness and modifications of body experience, while BN patients alternate recurrent episodes of binge eating and compensatory actions (*i.e.* purging, exercising) to prevent weight gain [2]. The evaluation and treatment of these disorders involve a multidisciplinary team, composed typically by psychiatrists, dieticians, psychologists and internal medicine physicians [3] and

the EDs diagnoses are based on clinical observations or structured interviews, diagnostic tests, psychometric and behavioural scales.

In general, patients with EDs are at greater risk of suicide attempts and poorer quality of life relative to both the general population and other psychiatric patients [4]. Moreover, high levels of disability and mortality risk are associated with all EDs. In particular, anorexia nervosa (AN) shows the highest mortality rate among all psychiatric diseases and it affects mostly adolescent girls [5]. Despite these urgencies and clinical priorities, the scientific literature shows an average delay of 5 years between ED symptom onset and treatment seeking [6].

Within this complex framework, the importance of an early EDs identification and intervention is crucial to avoid chronicization and to improve clinical outcomes [7]. Indeed, treatments seem to be more effective during the initial EDs manifestation. When the disorder is untreated, the clinical condition becomes more severe and treatment-resistant during the time passing [8].

The first steps for an early ED screening often occur in primary care or in non-psychiatric settings, followed

*Address correspondence to this author at the 18.56 Monitor Lab, Maria Bianca Corno Foundation, via Zucchi 1, Monza, Italy;
E-mail: alessandro.chinello@gmail.com

(for positive cases) by a subsequent clinical interview to confirm a diagnosis. Therefore, the use of rapid and easy screening tools is a crucial strategy to increase the EDs identification and to ensure an efficient orientation to mental health services [9]. In this regard, SCOFF is one of the most widely used screening tools for EDs identification [10, 11] and designed to be used by non-psychiatric professionals. Regarding the SCOFF, several studies confirmed high levels of specificity and sensitivity in patients with anorexia and bulimia nervosa [10, 12, 13], but a low detection rate of other specified feeding or eating disorders (EDNOs) [14] and a high percentage of false negatives on the general population [15].

The Eating Attitude Test-26 (EAT-26) is another self-report questionnaire used as a screening tool for EDs risk in a non-clinical population [16]. EAT-26 can detect individuals at high EDs risk focusing on behaviours and attitudes of anorexia (AN) and bulimia nervosa (BN). However, this questionnaire shows limited sensitivity as a screening tool for binge eating disorder (BED) and subclinical variants [17].

Administering both EAT-26 and SCOFF to EDs patients, Noma and colleagues [14] found a strong correlation between the two screening tools and no significant differences in the detection rates. However, to the best of our knowledge, no comparative studies regarding these screening tools have been carried out on the general population. In light of this, the aim of this pilot study was to compare the Italian translations of the SCOFF [18] and EAT-26 [19] to confirm the screening validity and risk distribution of these questionnaires even in a non-clinical and general sample.

MATERIAL AND METHOD

Participants

Participants were recruited considering the following inclusion criteria: 1) being Italian native females, 2) aged between 18-30 y.o., 3) without past/current neuropsychiatric diagnoses and 4) an informed consent was signed by all participants, as approved by the Committee for Research Evaluation (CRIP) of the Department of Psychology of the University of Milan-Bicocca (CRIP, N°RM 2020-302). The recruitment procedure took place from 22nd/June/2020 to 22nd/August/2020, by using ads on institutional Facebook, Instagram and Whatsapp pages. The

sample consists of mainly university students (196/254, 77%), recruited through the Sona System, a web-based university database dedicated to scientific recruitment (Psychology Dep. - University of Milan Bicocca; 23%). The final sample is composed by 254 Italian women, within two age ranges: 18-24 y.o. (N=203, 80%), and 25-30 y.o. (N=51, 20%).

Assessment

The experimental session was created using the Qualtrics software [20]. A web-based survey collected demographic variables and administered EAT-26 and SCOFF questionnaires. Demographic variables included: age range (18-24 and 25-30 y.o.), gender, height and weight (for BMI calculation), education and current profession. The Eating Attitudes Test (EAT-26) is a screening self-report for anorexia and bulimia nervosa risk detection. This tool is composed of twenty-six items scored on a 6-point Likert scale (from "Never" to "Always"), including three subscales: Dieting, Bulimia, and Food Preoccupation and Oral Control. The final score is calculated by summing items 1–26 (Item 26 is reverse-scored), with the clinical cut-off set at 20 points for the Italian population [19]. The SICK-CONTROL-ONE-FAT-FOOD (SCOFF) questionnaire is a screening tool dedicated to the core features of anorexia nervosa and bulimia nervosa. It is composed of 5 yes/no questions with a risk cut-off at ≥ 3 points for the Italian population [18].

RESULTS

Data Analysis

Data were analysed using R, Rstudio and JASP. The main intent was to replicate results found in Noma *et al.* [14], therefore, the analyses chosen were kept as similar as possible to the original paper. Moreover, exploratory analyses were performed to deepen the understanding of how the SCOFF and EAT-26 tests differ in terms of the detection of EDs risk in a non-clinical sample. Welch's two-sample t-tests and Pearson's correlation tests were conducted to investigate the linear relationships between the total scores at SCOFF and EAT-26 and, respectively, the variables of age and BMI. A Spearman's correlation test was used to test both the correlation between the total scores at SCOFF and EAT-26. McNemar's test was used to check for differences in the detection rates of the two questionnaires.

Questionnaires Results

Table 1: Sample Numerosity (N) and Proportions (%) of SCOFF (a) and EAT-26 (b) Scores and Population at Risk (*) Based on Cut-off for the Entire Sample

(a)

SCOFF Score	N (%)
<2	171 (67.32)
≥ 3	83 (32.68)
Total	254 (100)

(b)

EAT-26 Scores	N (%)
<20	218 (85,8)
≥20	36 (14,2)*
Total	254 (100)

Table 2: Demographic Variables, Including Age, Education, Profession, and Body Mass Index (BMI), Assessed for the Entire Sample. Sample Numerosity (N) and Proportions (%) are Reported

Variables	Levels	N (%)
Age range	18-24	203 (79.9)
	25-30	51 (20.1)
Education	High School Diploma	122 (48.0)
	Bachelor Degree	92 (36.2)
	Master Degree	37 (14.6)
	Lower secondary diploma	2 (0.8)
	PhD/Other	1 (0.4)
Profession	Student	196 (77.2)
	Full time employee	25 (9.8)
	Part Time Employee	14 (5.5)
	Freelancer	8 (3.2)
	Other	8 (3.2)
	Unemployed	3 (1.2)
BMI	-	21.7 ± 3.8 (Mean ± SD)

In terms of biographical variables, participants belonging to each subgroup were compared for age range, level of education, profession, and BMI (Body Mass Index). Subgroups do not show significant differences for age ranges ($\chi^2(1, 67)=0.09, p=0.76$), or levels of education ($\chi^2(3, 67)=5.79, p=0.12$). A Mann-

Whitney test showed no significant differences between subgroups regarding BMI ($U=299, p=0.81$).

Regarding age ranges, the two subgroups did not differ significantly considering the scores of the two questionnaires (SCOFF: $p=0.62$; EAT-26: $p=0.3$). Alternatively, a Pearson's positive correlation emerged between BMI and SCOFF score ($r=0.16, p=0.01$), but not considering the EAT-26 score ($p=0.35$).

Total scores of both questionnaires correlated positively ($r= 0.53, p<0.001$), exhibiting the 74% of inter-questionnaire risk accordance (187/254).

To determine whether the two questionnaires were measuring the same constructs, a contingency table was created (Table 3). McNemar's test was used to compare detection rates and a significant association were observed ($\chi^2(1, 254)=31.58, p<0.001$), despite 26% of the whole sample showed mismatching results for the two questionnaires for ED risk (shown in bold in Table 3).

Table 3: Contingency Table About Risk Levels between EATS-26 and SCOFF (Based on Cut-off). Numerosities (N) are shown for Each Group

EAT-26 (N)			
SCOFF (N)	No risk (<20)	Risk (≥20)	Total
No risk (<2)	161	10	171
Risk (≥3)	57	26	83
Total	218	36	254

DISCUSSION

This pilot study stemmed from the results of a previous research [14], in which a positive and strong correlation between detection rates of EAT-26 and SCOFF was found in a clinical population. However, these two questionnaires are often used in primary care and or non-psychiatric environments, with limited studies recruiting non-clinical participants. Specifically, this study addresses to this point, exploring the correlation between SCOFF and EAT-26 risk scores in a non-clinical sample, composed by young Italian female participants.

Our main findings indicate that the EDs risk rate of both screening tools in a non-clinical sample is lower than in a clinical population: 33% of the sample had a positive risk by using SCOFF and 14% by using EAT-26. As found in literature, the study shows an overall

positive risk of about 37% (93/254) in a non-clinical sample when assessed with the SCOFF [21] or EAT-26 [22]. In general, the two screening tools are strongly risk coherent (74%).

Interestingly, in our non-clinical sample, a notable part of the sample showed mismatching results between the two tools. 26% of the sample showed a positive (or negative) risk at the EAT-26 and a negative (or positive) risk at the SCOFF. The reason for this phenomenon might be due to the different nature of the two screening tools, also in terms of risk sensitivity/specificity and training requirements. For SCOFF, the Italian translation of the SCOFF and EAT-26 reported a risk of 13% regarding false-negative cases, while EAT-26 showed a false-positive rate of 18% [18]. Compared to previous literature [14], mismatched risk cases (26%) might be dependent on 1) translation differences among international versions of questionnaires, 2) necessity of training for questionnaire assessment. In particular, SCOFF is widely used by primary care doctors and not requiring training to be administered, 3) the influence of clinical vs. non-clinical settings on the quality of item scoring, and 4) a low sensitivity in case of binge eating disorders (BED), subclinical variants and EDNOs among the study participants.

Taken together, the present results indicate that both screening tools are reliable for EDs detection in young females. Moreover, especially for EAT-26, the combined use of both questionnaires improve robustly the risk detection (+23%) for eating disorders in young female adults. Considering the population age, both EAT-26 and SCOFF questionnaires may be use as screening tools applied to university students and young workers, even adopting online modalities. Further studies may occur to better understand the specific factors influencing mismatching results in terms of EDs risk between the two questionnaires, even associating clinical and structured interviews to better clarify the discrepancy and disentangling those items not strictly (and only) related to the presence of an eating disorder (e.g. body image alterations in other psychiatric disorders).

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

REFERENCES

- [1] VanderHam T, Meulman JJ, VanStrien DC, vanEngeland H. Empirically based subgrouping of eating disorders in adolescents: a longitudinal perspective. 1997; *Br. J. Psychiatry*, 170: 363-68.
<https://doi.org/10.1192/bjp.170.4.363>
- [2] American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed., Text Revision. 2022; Washington DC: American Psychiatric Association.
<https://doi.org/10.1176/appi.books.9780890425787>
- [3] National Institute for Health and Care Excellence. Eating disorders: recognition and treatment. 2017; NICE website. <http://www.nice.org.uk/guidance/ng69>. Accessed 14 Nov 2023.
- [4] Barakat S, McLean SA, Bryant E, Le A, Marks P, Touyz S, & Maguire S. Risk factors for eating disorders: findings from a rapid review. 2023; *Journal of eating disorders*, 11(1): 8.
- [5] Treasure J, Duarte TA, & Schmidt U. Eating disorders. *Lancet* [Internet]. 2020; 395 (10227): 899-911.
[https://doi.org/10.1016/S0140-6736\(20\)30059-3](https://doi.org/10.1016/S0140-6736(20)30059-3)
- [6] Hamilton A, Mitchison D, Basten C, Byrne S, Goldstein M, Hay P, *et al.* Understanding treatment delay: perceived barriers preventing treatment-seeking for eating disorders. 2021; *Aust N Z J Psychiatry*, 12: 00048674211020102.
<https://doi.org/10.1177/00048674211020102>
- [7] Austin A, Flynn M, Shearer J, Long M, Allen K, Mountford VA... & Schmidt U. The first episode rapid early intervention for eating disorders-upscaled study: clinical outcomes. 2022; *Early Intervention in Psychiatry*, 16(1): 97-105.
<https://doi.org/10.1111/eip.13139>
- [8] Treasure J, Stein D, & Maguire S. Has the time come for a staging model to map the course of eating disorders from high risk to severe enduring illness? An examination of the evidence. 2015; *Early intervention in psychiatry*, 9(3), 173-184.
<https://doi.org/10.1111/eip.12170>
- [9] Parker SC, Lyons J, & Bonner J. Eating Disorders in Graduate Students: Exploring the SCOFF Questionnaire as a Simple Screening Tool. 2005; *Journal of American College Health*, 54(2), 103-107.
<https://doi.org/10.3200/JACH.54.2.103-107>
- [10] Morgan, JF, Reid F, & Lacey JH. The SCOFF questionnaire: assessment of a new screening tool for eating disorders. 1999; *British Medical Journal*, 319(7223), 1467-1468.
<https://doi.org/10.1136/bmj.319.7223.1467>
- [11] Kutz AM, Marsh AG, Gunderson CG, *et al.* Eating Disorder Screening: a systematic review and meta-analysis of diagnostic test characteristics of the SCOFF. 2020; *Journal of general internal medicine*, 35, 885-893 (2020).
<https://doi.org/10.1007/s11606-019-05478-6>
- [12] Luck, AJ, Morgan JF, Reid F, O'Brien A, Brunton J. Price C... & Lacey JH. The SCOFF questionnaire and clinical interview for eating disorders in general practice: comparative study. 2002; *British Medical Journal*, 325(7367): 755-756.
<https://doi.org/10.1136/bmj.325.7367.755>
- [13] Garcia-Campayo J, Sanz-Carrillo C, Ibañez JA, Lou S, Solano V, & Alda M. Validation of the Spanish version of the SCOFF questionnaire for the screening of eating disorders in primary care. 2005; *Journal of psychosomatic research*, 59(2): 51-55.
<https://doi.org/10.1016/j.jpsychores.2004.06.005>
- [14] Noma SI, Nakai Y, Hamagaki S, Uehara M, Hayashi A, & Hayashi T. Comparison between the SCOFF questionnaire and the Eating Attitudes Test in patients with eating disorders. 2006; *International Journal of Psychiatry in Clinical Practice*, 10(1): 27-32.
<https://doi.org/10.1080/13651500500305275>
- [15] Solmi F, Hatch SL, Hotopf M, Treasure J, & Micali N. Validation of the SCOFF questionnaire for eating disorders in a multiethnic general population sample. 2015; *International Journal of Eating Disorders*, 48(3): 312-316.
<https://doi.org/10.1002/eat.22373>
- [16] Garner DM, Olmsted MP, Bohr Y, & Garfinkel PE. The eating attitudes test: psychometric features and clinical correlates.

- 1982; *Psychological medicine*, 12(4): 871-878.
<https://doi.org/10.1017/S0033291700049163>
- [17] Orbitello B, Ciano R, Corsaro M, Rocco PL, Taboga C, Tonutti L... & Balestrieri M. The EAT-26 as screening instrument for clinical nutrition unit attenders. 2006; *International journal of obesity*, 30(6): 977-981.
<https://doi.org/10.1038/sj.ijo.0803238>
- [18] Pannocchia L, Di Fiorino M, Giannini M, & Vanderlinden J. A psychometric exploration of an Italian translation of the SCOFF questionnaire. 2011; *European Eating Disorders Review*, 19(4): 371-373.
<https://doi.org/10.1002/erv.1105>
- [19] Dotti A, & Lazzari R. Validation and reliability of the Italian EAT-26. 1998; *Eating and weight disorders-studies on anorexia, bulimia and obesity*, 3(4): 188-194.
<https://doi.org/10.1007/BF03340009>
- [20] Qualtrics. Qualtrics Survey Software (2019). Provo, UT: Qualtrics. <https://www.qualtrics.com>
- [21] D'Anna G, Lazzarotti M, Castellini G, Ricca V, Cassioli E, Rossi E... & Voller F. Risk of eating disorders in a representative sample of Italian adolescents: prevalence and association with self-reported interpersonal factors. 2022; *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*, 27(2): 701-708.
<https://doi.org/10.1007/s40519-021-01214-4>
- [22] Miller JL, Schmidt LA, Vaillancourt T, McDougall P, & Laliberte M. Neuroticism and introversion: A risky combination for disordered eating among a non-clinical sample of undergraduate women. 2006; *Eating behaviors*, 7(1): 69-78.
<https://doi.org/10.1016/j.eatbeh.2005.07.003>

Received on 19-06-2024

Accepted on 26-07-2024

Published on 30-07-2024

DOI: <https://doi.org/10.12974/2313-1047.2024.11.04>

© 2024 Chinello et al.

This is an open access article licensed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/3.0/>) which permits unrestricted, non-commercial use, distribution and reproduction in any medium, provided the work is properly cited.