



# The use and misuse of the SCOFF screening measure over two decades: a systematic literature review

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## Abstract

**Purpose** The SCOFF questionnaire was designed as a simple, memorable screening tool to raise suspicion that a person might have an eating disorder. It is over 20 years since the creation of the SCOFF, during which time it has been widely used. Considering this, we wish to review the use of the SCOFF in peer-reviewed scientific journals, and to assess whether it is being used appropriately in the manner in which it was originally devised and tested.

**Methods** The Preferred Reporting Items for a Systematic Review and Meta-analysis (PRISMA) guidelines were followed, and all search strategies and methods were determined before the onset of the study. PubMed and Wiley Online Library were searched using the terms *SCOFF* and *eating*. Two reviewers were involved in the reviewing process. Criteria for appropriate use of the SCOFF were formalised with the tool's original authors.

**Results** 180 articles were included in the final review. 48 articles had used the SCOFF appropriately, 117 articles inappropriately and 15 articles had been mixed in the appropriateness of their use.

**Conclusion** This systematic review highlights the inappropriate use of the SCOFF in diverse languages and settings. When used correctly the SCOFF has made a significant contribution to the understanding of eating disorders and its simplicity has been applauded and led to widespread use. However in over two-thirds of studies, the use of the SCOFF was inappropriate and the paper highlights how and in what way it was misused, Guidelines for the appropriate use of the SCOFF are stated. Future validation and avenues of research are suggested.

**Level of evidence** Level I.

**Keywords** SCOFF · Eating disorders · Anorexia nervosa · Bulimia nervosa · Questionnaires · Screening

## Introduction

Early detection and treatment of eating disorders (EDs) can improve prognosis and likelihood of recovery [1], however their presence can often be overlooked or misdiagnosed initially by clinicians [2]. With an estimated 55.5 million people affected [3] and rates appearing to be on the rise [4, 5], the use of tools to assist in the timely identification and access to support for ED sufferers is important.

The SCOFF questionnaire, first published in 1999, was designed as a simple, memorable screening tool to raise suspicion that an ED might exist [6]. It was developed in response to a lack of robust short screening measures, particularly for use in primary care [7]. The questionnaire was intended to suggest a likely case, rather than to diagnose an ED, and to be followed up by a thorough assessment with a trained clinician prior to diagnosis [6]. It was validated against the DSM-IV diagnostic criteria for anorexia nervosa

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(AN) and bulimia nervosa (BN) [6]. The measure has been used widely since its conception in both clinical and research settings and has gained traction in popular culture with features in publications such as *Teen Vogue* [8] and *GQ* magazine [9]. However, we have become aware of some examples of the inappropriate use of the SCOFF as a diagnostic rather than screening tool; for example, it was recently employed as part of the NHS Health Survey for England to estimate the prevalence of EDs in the country [10].

It is over 20 years since the SCOFF was devised and tested and we, the original developers, conscious of its widespread use in many countries and languages, feel it timely to review its use in peer-reviewed scientific journals. This paper reviews a large sample of the available literature and assesses the appropriateness of the SCOFF's use in each publication. The review will not be addressing the SCOFF's misuse amongst non-research settings (e.g. public health campaigns), however it will aim to clarify the guidelines of using the SCOFF, thereby benchmarking the future use of the SCOFF. To the authors' knowledge, there have not been similar reviews assessing the appropriate use of the SCOFF questionnaire.

## Method

### Search strategy and inclusion criteria

The Preferred Reporting Items for a Systematic Review and Meta-analysis (PRISMA) guidelines [11] were followed in preparing this systematic review and all search strategies and methods were determined before the onset of the study. The review was not registered. The intention to conduct the review was announced at a national and an international conference and it was agreed by the original authors and the editor of a potential journal. The intention was stated on the UK ED specialist website to avoid unnecessary duplication.

For the literature search, PubMed and Wiley Online Library were employed. The publication timeframe was limited to 1999 (the year the questionnaire was developed) through to the date of the search. The search terms *SCOFF* and *eating* were searched for in the title and/or abstract. It was felt these search terms captured the breadth of the literature whilst excluding many publications which used the term 'scoff' in the colloquial sense. The results from the search are given in Fig. 1.

Two reviewers (ACo and ACI) were involved in the search process and the results were considered in two steps. Initially, the titles and abstracts of each article were reviewed, by either ACo or ACI, using the following inclusion criteria: (1) a journal article published in an academic journal; (2) the article was written in English and/or a translation was available; (3) the article

was related to eating and/or mental health. The full text of those articles included were then examined. During the full review articles were required to meet the initial inclusion criteria and, in addition, demonstrate use of the SCOFF questionnaire as a primary focus within their research (i.e. not simply as a reference). To avoid conflicts of interest, articles authored by the original SCOFF authors in relation to the development of the tool were excluded. Full text articles were reviewed twice—once by each reviewer to ensure the review was robust and objective. Finally, articles included in the final review were assessed to be either appropriate or inappropriate in their use of the SCOFF. It was felt that a subsection of articles were less clear cut in the appropriateness of their use of the measure. These articles tended to have used the SCOFF appropriately, however could have ideally used more caution in their interpretation of the results or been more clear and consistent in their description of the measure and/or results. As such, these were classified as 'mixed' use. The classification of each article was cross-checked by each reviewer independently. Any uncertainties at any stage of the review process were resolved by the SCOFF's original authors.

### Data extraction and quality assessment

The reviewers (ACo and ACI) used a data collection tracker to extract data on the title, database extracted from, author(s), year of publication, research study design, aim of the study, the use of the SCOFF questionnaire, and the appropriateness of its use. Criteria for appropriate use—which were developed with the tool's original authors—are shown in Table 1.

The quality of the research articles included in this systematic review was not analysed, beyond looking at the appropriate use of the SCOFF, as it was important for articles of all quality to be included to assess the full breadth of research.

## Results

A full overview of the articles reviewed and details of the findings can be found in the supplementary table (Supplementary Information). One hundred and eighty articles met the criteria for inclusion in the review (Fig. 1). Forty-eight articles had used the SCOFF tool appropriately [12–59], 117 articles had used the SCOFF inappropriately [60–176] and 15 articles had been mixed in their use [177–191]. The review found 16 translations of the SCOFF, including Italian, Brazilian-Portuguese, Arabic and Chinese (more information can be found in the Supplementary Information).

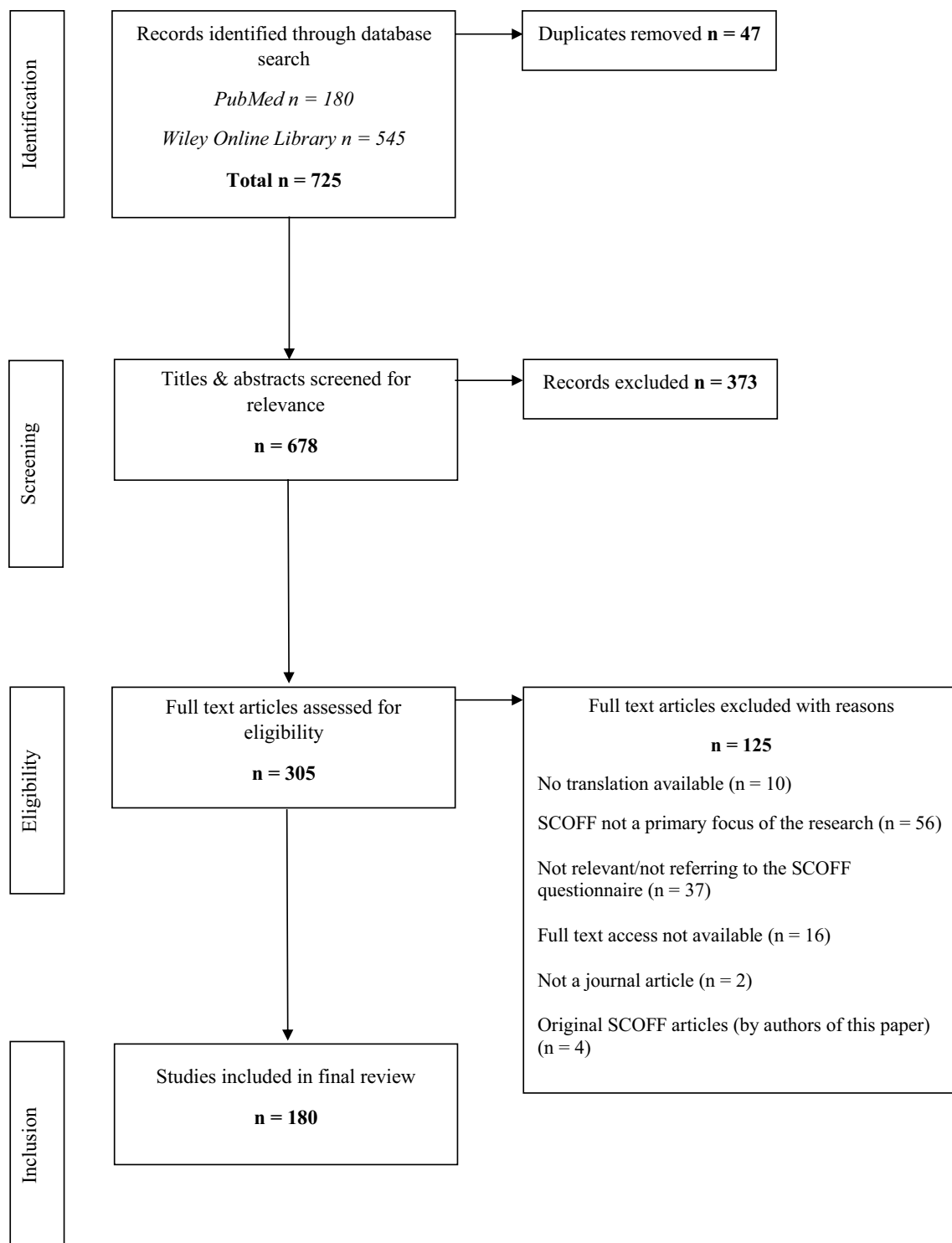


Fig. 1 PRISMA flowchart

Table 2 gives a summary of the usage errors in the ‘not appropriate’ and ‘mixed’ categories. A subsection of articles fell under multiple usage errors (see Supplementary Information for further details).

## Discussion

Early detection of EDs is an important factor for improved prognosis [1]. The SCOFF questionnaire was developed primarily for use, as a screening tool in primary care, to

**Table 1** Criteria for appropriate use of the SCOFF

All articles	Must be utilised as a screening tool, not diagnostic Must interpret results as a 'screen' (e.g. 'screened positive') Must include the term 'eating disorder' but with a level of caution (e.g. 'possible/likely eating disorder' or 'at increased risk of having an ED')
Translated/modified versions	Needs to have been back translated or used another appropriate translation method Needs to be some evidence of validation of the modified version
Amending scoring	The cut-off point of 2 can be altered in different populations if a clinical rationale is presented and there is evidence of validation of the amended measure

**Table 2** Description of usage errors of articles classed as not appropriate or mixed use of the SCOFF

	Usage error	Number of articles
A	Insufficient caution used when interpreting the results, resulting in a more diagnostic interpretation than screening	46
B	Used to measure 'disordered eating' (abnormal eating behaviour that does not meet the criteria for a clinically diagnosable ED [192]) or similar	34
C	Used to assess ED symptoms, either as a continuous 5-point scale or via analysis of separate items	26
D	Incorrect interpretation of how SCOFF relates to the risk of having an ED (including interpreting as future risk; or a negative SCOFF meaning no risk; or an imprecise/ambiguous description of risk)	20
E	Inconsistent interpretation of the SCOFF as a screening tool throughout the article	17
F	Amended scoring/cut-off thresholds for the SCOFF but without clinical rationale given	9
G	No clear description of the SCOFF as a screening tool	4
H	No validation of a translated measure	3
I	Used to assess body dysmorphic disorder, without validation	1

107 papers were attributed to one error, 22 papers to 2 errors, 3 papers to 3 errors

facilitate early detection of EDs [7]. This review examined the widespread use of the SCOFF questionnaire in the academic field. Its use has assisted in expanding knowledge and the understanding of eating disorders. However, it is clear from this review that the original function of the tool, that is, to raise suspicion that an eating disorder may be present, has in many cases been lost. Researchers, clinicians and peer-reviewed journals need to be more rigorous in only accepting data when the SCOFF is used as described in the original studies which reported its efficacy and reliability. This should not preclude, however, encouraging some exciting avenues of the SCOFF's use which require further research, such as the validation of SCOFF for DSM-V criteria for EDs, and the use of the SCOFF to assess risk of future EDs. To assist, we have provided guidelines for appropriate use of the SCOFF in Table 1.

This review shows that the use of the SCOFF has grown globally and has been translated into many different languages. Overall, the translation of the SCOFF was executed well with the use of back-translation methods, or similar, and for most translations the modified version was further validated. The vast translation and global use of the SCOFF reflects its memorability and simplicity.

The authors found that the level of caution used when reporting and interpreting the SCOFF results was insufficient

and/or inconsistent in a large number of articles. Researchers must remain mindful as to the screening nature of the SCOFF and report their results in line with this. It is paramount that the reader is clear the SCOFF merely raises the suspicion that an ED may exist, as opposed to confirming its presence as a diagnostic fact.

The SCOFF was at times employed to assess a persons' future risk of developing an ED, which is distinctly different to assessing the likelihood that an ED may exist currently. The items on the SCOFF tool address the core features of AN and BN. To measure a person's future risk of developing an ED, greater focus on risk factors is needed [192]. Additionally, the SCOFF has not been validated against future risk and as such this use should be avoided until further validation has been completed. Some articles mistakenly interpreted a negative SCOFF result as indicating 'no risk of ED', while others were imprecise or unclear in their use of the terminology around risk. Other articles presented the 'risk of EDs' for their whole sample group—this is effectively prevalence, and reflects SCOFF being used inappropriately in a diagnostic tool.

There is perhaps a more philosophical question around the meaningfulness of studies looking for correlates or predictors of being screened positive on SCOFF (i.e. using an endpoint of 'positive/negative screen' or 'at higher risk

of having an ED/not higher risk'). Even when sufficient caveats were provided on the exact meaning of being SCOFF positive, in most cases it seemed that this was being presented as a proxy for having an eating disorder. The use of SCOFF (or indeed any screening tool) to define an endpoint in its own right goes beyond its original purpose and requires careful consideration in studies planning such use.

The SCOFF was also widely used to assess disordered eating (DE). DE is generally considered to refer to abnormal eating behaviour that does not meet the criteria for a clinically diagnosable ED [193]. Although the SCOFF is designed to be supplemented by further clinical assessment, it was developed in line with the core features of AN and BN and was validated against DSM-IV diagnostic guidelines [6]. As such, the SCOFF has not been validated to assess eating behaviour that does not meet the diagnostic threshold. From the articles included in this review, there does not appear to have been a robust validation of the SCOFF for assessment of DE, however this would be an exciting avenue of research and would further strengthen the tool's use for early detection within primary care.

The use of the SCOFF to assess ED symptoms was also present in a subsection of the articles reviewed. A number of these articles analysed the individual items of the SCOFF separately to explore specific ED symptoms. Others analysed the SCOFF as a continuous measure (i.e. a higher score indicated more ED symptoms). Again, authors must remain mindful as to the screening nature of the SCOFF. Consisting of just five items, the SCOFF should be taken as a whole, categorical measure to maintain the specificity and sensitivity of the tool. In addition, the original purpose of the tool must be maintained—that is, to raise suspicion that an ED may exist as opposed to assessing the level or presence of symptomatology.

When the SCOFF is used outside of the parameters of its validity and reliability there is a far higher probability of the outcomes being misinterpreted and overstated—as was the case with the media's coverage of the NHS Health Survey for England [194]. Thus, it is important to ensure the measure is being used appropriately. Nonetheless, it is promising to see an easily accessible screening tool, such as the SCOFF, used so widely within academia and an ever-growing body of research into EDs. There are some exciting avenues of research to explore expanding the scope of the SCOFF. However, in the absence of further validation, the authors of this review, and the original authors of the SCOFF, propose the criteria for appropriate use of the questionnaire detailed in the methodology of this review (Table 1) be used at present to preserve its function as a screening tool.

## Strengths and limitations

The primary strength of this review is the number of articles included due to the wide scope of the search strategy. In addition, the inclusion of a secondary reviewer ensured a robust methodology and limited the subjectivity of the results. Due to the vast amount of research employing the SCOFF and the limited manpower of this review, the decision was made to limit the search to just two databases and not to conduct further stages of the search process such as manually searching reference lists. In addition, due to access rights, the reviewers were limited in the databases they were able to search, hence why PubMed and Wiley Online Library were selected. The authors acknowledge that, as such, a subsection of relevant articles may have been missed, however it is felt that the objective of the review was achieved nevertheless, and the review remained systematic in nature due to the methods employed.

## Conclusion

This paper reviewed and assessed the use of the SCOFF questionnaire in a large sample of academic papers. In two-thirds of cases, researchers used the SCOFF inappropriately and this paper highlights how and in what way it was misused. However, when used correctly (using the guidelines given in Table 1), the SCOFF remains a relevant, valid and reliable tool for the screening of possible ED cases. Its use within the research field and beyond is indicative of the ever-growing exploration into and understanding of these disorders. There are exciting avenues of future research identified in this review which the authors encourage, including validation of the SCOFF against updated DSM-5 criteria, its ability to assess future risk, and its efficacy in screening for DE.

## What is already known on this subject?

The use of the SCOFF is commonplace within academic literature. The original article detailing the development of the SCOFF outlined its intended use.

## What this study adds?

This review shows that in many peer-reviewed papers, the SCOFF is used inappropriately and the paper details how and in what way it is misused. The paper re-establishes guidelines for the SCOFF's appropriate use.

**Supplementary Information** The online version contains supplementary material available at <https://doi.org/10.1007/s40519-024-01656-6>.

**Author contributions** All authors contributed to the study conception and design. Data collection and analysis were performed by Amy Coop and Amelia Clark. The first draft of the manuscript was written by Amy Coop and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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**Data availability** Detailed data availability is in the supplementary table available on the online version.

## Declarations

**Competing interests** The authors have no relevant financial or non-financial interests to disclose.

**Ethical approval** This is a review article and so no ethical approval was required.

**Informed consent** This is a review paper and no patients or subjects took part; therefore no informed consent was needed.

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## References

- Treasure J, Russell G (2011) The case for early intervention in anorexia nervosa: theoretical exploration of maintaining factors. *Br J Psychiatry* 199:5–7. <https://doi.org/10.1192/bjp.bp.110.087585>
- Mehler P, Andersen A (2010) *Eating disorders: a quick guide to medical care and complications*, 2nd edn. John Hopkins University Press, Baltimore
- Santomauro DF, Melen S, Mitchison D et al (2021) The hidden burden of eating disorders: an extension of estimates from the global burden of disease study 2019. *Lancet Psychiatry* 8:320–328. [https://doi.org/10.1016/S2215-0366\(21\)00040-7](https://doi.org/10.1016/S2215-0366(21)00040-7)
- NHS England (2022) NHS treating record number of young people for eating disorders. In: NHS England. <https://www.england.nhs.uk/2022/03/nhs-treating-record-number-of-young-people-for-eating-disorders/>. Accessed 15 June 2022
- Devoe DJ, Han A, Anderson A et al (2023) The impact of the COVID-19 pandemic on eating disorders: a systematic review. *Int J Eat Disord* 56:5–25. <https://doi.org/10.1002/eat.23704>
- Morgan JF, Reid F, Lacey JH (1999) The SCOFF questionnaire: assessment of a new screening tool for eating disorders. *BMJ* 319:1467–1468. <https://doi.org/10.1136/bmj.319.7223.1467>
- Luck AJ, Morgan JF, Reid F et al (2002) The SCOFF questionnaire and clinical interview for eating disorders in general practice: comparative study. *BMJ* 325:755–756. <https://doi.org/10.1136/bmj.325.7367.755>
- Benoit A (2016) This is the test doctors use to determine if you might have an eating disorder. In: *Teen Vogue*. <https://www.teenvogue.com/story/eating-disorder-test-used-by-doctors>. Accessed 15 June 2022
- Barwise A (2017) Everything you need to know about eating disorders in men. In: *GQ*. <https://www.gq-magazine.co.uk/article/eating-disorders-in-men>. Accessed 15 June 2022
- Marcheselli F, Light R (2020) Health survey for England 2019 eating disorders
- Page MJ, McKenzie JE, Bossuyt PM et al (2021) The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*. <https://doi.org/10.1136/bmj.n71>
- Aoun A, Garcia FD, Mounzer C et al (2013) War stress may be another risk factor for eating disorders in civilians: a study in Lebanese university students. *Gen Hosp Psychiatry* 35:393–397. <https://doi.org/10.1016/j.genhosppsych.2013.02.007>
- Aoun A, Azzam J, ElJabbour F et al (2015) Validation of the Arabic version of the SCOFF questionnaire for the screening of eating disorders. *East Mediterr Health J* 21:326–331. <https://doi.org/10.26719/2015.21.5.326>
- Bryant E, Miskovic-Wheatley J, Touyz SW et al (2021) Identification of high risk and early stage eating disorders: first validation of a digital screening tool. *J Eat Disord* 9:1–10. <https://doi.org/10.1186/s40337-021-00464-y>
- Burke NL, Hazzard VM, Karvay YG et al (2021) Eating disorder prevalence among multiracial US undergraduate and graduate students: is multiracial risk different than the sum of each identity? *Eat Behav* 41:101501. <https://doi.org/10.1016/j.eatbeh.2021.101501>
- Castellon P, Sudres JL, Voltzenlogel V (2020) Self-defining memories in female patients with anorexia nervosa. *Eur Eat Disord Rev* 28:513–524. <https://doi.org/10.1002/erv.2739>
- Chan CW, Leung SF (2015) Validation of the eating disorder examination questionnaire: an online version. *J Hum Nutr Diet* 28:659–665. <https://doi.org/10.1111/jhn.12275>
- Cotton M-A, Ball C, Robinson P (2003) Four simple questions can help screen for eating disorders. *J Gen Intern Med* 18:53–56
- Dooley-Hash S, Lipson SK, Walton MA, Cunningham RM (2013) Increased emergency department use by adolescents and young adults with eating disorders. *Int J Eat Disord* 46:308–315. <https://doi.org/10.1002/eat.22070>
- Evans J, Horn K, Cowan D, Brunero S (2020) Development of a clinical pathway for screening and integrated care of eating disorders in a rural substance use treatment setting. *Int J Ment Health Nurs* 29:878–887. <https://doi.org/10.1111/inm.12722>
- Fairburn CG, Rothwell ER (2015) Apps and eating disorders: a systematic clinical appraisal. *Int J Eat Disord* 48:1038–1046. <https://doi.org/10.1002/EAT.22398>
- Forbush KT, Wildes JE, Hunt TK (2014) Gender norms, psychometric properties, and validity for the eating pathology symptoms inventory. *Int J Eat Disord* 47:85–91. <https://doi.org/10.1002/eat.22180>
- Fursland A, Watson HJ (2014) Eating disorders: a hidden phenomenon in outpatient mental health? *Int J Eat Disord* 47:422–425. <https://doi.org/10.1002/eat.22205>
- Ganson KT, Murray SB, Nagata JM (2021) Associations between eating disorders and illicit drug use among college students. *Int J Eat Disord* 54:1127–1134. <https://doi.org/10.1002/eat.23493>

25. Garcia FD, Grigioni S, Chelali S et al (2010) Validation of the French version of SCOFF questionnaire for screening of eating disorders among adults. *World J Biol Psychiatry* 11:888–893. <https://doi.org/10.3109/15622975.2010.483251>
26. Garcia FD, Grigioni S, Allais E et al (2011) Detection of eating disorders in patients: validity and reliability of the French version of the SCOFF questionnaire. *Clin Nutr* 30:178–181. <https://doi.org/10.1016/j.clnu.2010.09.007>
27. Garcia-Campayo J, Sanz-Carrillo C, Ibañez JA et al (2005) Validation of the Spanish version of the SCOFF questionnaire for the screening of eating disorders in primary care. *J Psychosom Res* 59:51–55. <https://doi.org/10.1016/j.jpsychores.2004.06.005>
28. Hosoda Y, Ohtani T, Hanazawa H et al (2021) Establishment of a Japanese version of the sick, control, one stone, fat, and food (SCOFF) questionnaire for screening eating disorders in university students. *BMC Res Notes*. <https://doi.org/10.1186/s13104-021-05549-0>
29. Jugale PV, Pramila M, Murthy AK, Rangath S (2014) Oral manifestations of suspected eating disorders among women of 20–25 years in Bangalore City, India. *J Health Popul Nutr* 32:46–50
30. Kotyuk E, Farkas J, Magi A et al (2019) The psychological and genetic factors of the addictive behaviors (PGA) study. *Int J Methods Psychiatr Res* 28:e1748. <https://doi.org/10.1002/mpr.1748>
31. Koyanagi A, Stickley A, Haro JM (2016) Psychotic-like experiences and disordered eating in the English general population. *Psychiatry Res* 241:26–34. <https://doi.org/10.1016/j.psychres.2016.04.045>
32. Lähteenmäki S, Aalto-Setälä T, Suokas JT et al (2009) Validation of the Finnish version of the SCOFF questionnaire among young adults aged 20 to 35 years. *BMC Psychiatry* 9:1–8. <https://doi.org/10.1186/1471-244X-9-5>
33. Leung SF, Lee KL, Lee SM et al (2009) Psychometric properties of the SCOFF questionnaire (Chinese version) for screening eating disorders in Hong Kong secondary school students: a cross-sectional study. *Int J Nurs Stud* 46:239–247. <https://doi.org/10.1016/j.ijnurstu.2008.09.004>
34. Lichtenstein MB, Haastrup L, Johansen KK et al (2021) Validation of the eating disorder examination questionnaire in Danish eating disorder patients and athletes. *J Clin Med* 10:3976. <https://doi.org/10.3390/jcm10173976>
35. Lichtenstein MB, Hemmingsen SD, Støving RK (2017) Identification of eating disorder symptoms in Danish adolescents with the SCOFF questionnaire. *Nord J Psychiatry* 71:340–347. <https://doi.org/10.1080/08039488.2017.1300322>
36. Liu CY, Tseng MCM, Chen KY et al (2015) Sex difference in using the SCOFF questionnaire to identify eating disorder patients at a psychiatric outpatient clinic. *Compr Psychiatry* 57:160–166. <https://doi.org/10.1016/j.comppsy.2014.11.014>
37. Maguen S, Hebenstreit C, Li Y et al (2018) Screen for disordered eating: improving the accuracy of eating disorder screening in primary care. *Gen Hosp Psychiatry* 50:20–25. <https://doi.org/10.1016/j.genhosppsych.2017.09.004>
38. Mond JM, Myers TC, Crosby RD et al (2008) Screening for eating disorders in primary care: EDE-Q versus SCOFF. *Behav Res Ther* 46:612–622. <https://doi.org/10.1016/j.brat.2008.02.003>
39. Castro AM, Beltrán-Barrios T, Mercado-Lara M (2021) Assessment of the frequency of sleep complaints and menopausal symptoms in climacteric women using the Jenkins sleep scale. *Sleep Sci* 14:92–100. <https://doi.org/10.5935/1984-0063.20200041>
40. Pannocchia L, Di Fiorino M, Giannini M, Vanderlinden J (2011) A psychometric exploration of an Italian translation of the SCOFF questionnaire. *Eur Eat Disord Rev* 19:371–373. <https://doi.org/10.1002/erv.1105>
41. Parker SC, Lyons J, Bonner J (2005) Eating disorders in graduate students: exploring the SCOFF questionnaire as a simple screening tool. *J Am Coll Health* 54:103–107. <https://doi.org/10.3200/JACH.54.2.103-107>
42. Phillips L, Kempainen JK, Mechling BM et al (2015) Eating disorders and spirituality in college students. *J Psychosoc Nurs* 53:30–37
43. Prnjak K, Mitchison D, Griffiths S et al (2020) Further development of the 12-item EDE-QS: identifying a cut-off for screening purposes. *BMC Psychiatry*. <https://doi.org/10.1186/s12888-020-02565-5>
44. Estecha Querol S, Fernández Alvira JM, Mesana Graffe MI et al (2016) Nutrient intake in Spanish adolescents SCOFF high-scorers: the AVENA study. *Eat Weight Disord* 21:589–596. <https://doi.org/10.1007/s40519-016-0282-8>
45. Rai D, Kerr MP, McManus S et al (2012) Epilepsy and psychiatric comorbidity: a nationally representative population-based study. *Epilepsia* 53:1095–1103. <https://doi.org/10.1111/j.1528-1167.2012.03500.x>
46. Sánchez-Armass O, Drumond-Andrade FC, Wiley AR et al (2012) Evaluation of the psychometric performance of the SCOFF questionnaire in a Mexican young adult sample. *Salud Publica Mex* 54:375–382. <https://doi.org/10.1590/S0036-36342012000400007>
47. Saßmann H, Albrecht C, Busse-Widmann P et al (2015) Psychometric properties of the German version of the diabetes eating problem survey-revised: additional benefit of disease-specific screening in adolescents with type 1 diabetes. *Diabet Med* 32:1641–1647. <https://doi.org/10.1111/dme.12788>
48. Shaikh MA, Kayani A (2014) Detection of eating disorders in 16–20 year old female students—perspective from Islamabad, Pakistan. *J Pak Med Assoc* 64:334–336
49. Siervo M, Boschi V, Papa A et al (2005) Application of the SCOFF, eating attitude test 26 (EAT 26) and eating inventory (TFEQ) questionnaires in young women seeking diet-therapy. *Eat Weight Disord* 10:76–82. <https://doi.org/10.1007/BF03327528>
50. Simioni N, Cottencin O (2016) Screening for eating disorders in outpatient smoking cessation: feasibility, pertinence, and acceptance of referral to specific treatment. *Int J Eat Disord* 49:1018–1022. <https://doi.org/10.1002/eat.22564>
51. Solmi F, Hatch SL, Hotopf M et al (2015) Validation of the SCOFF questionnaire for eating disorders in a multiethnic general population sample. *Int J Eat Disord* 48:312–316. <https://doi.org/10.1002/eat.22373>
52. Teixeira AA, Roque MA (2021) The Brazilian version of the SCOFF questionnaire to screen eating disorders in young adults: cultural adaptation and validation study in a university population. *Braz J Psychiatry* 43:613–616. <https://doi.org/10.1590/1516>
53. Trott M, Johnstone J, McDermott DT et al (2022) The development and validation of the secondary exercise addiction scale. *Eat Weight Disord Stud Anorex Bulim Obes* 27:1427–1436. <https://doi.org/10.1007/s40519-021-01284-4>
54. Tseng MCM, Chen KY, Chang CH et al (2016) Variables influencing presenting symptoms of patients with eating disorders at psychiatric outpatient clinics. *Psychiatry Res* 238:338–344. <https://doi.org/10.1016/j.psychres.2016.02.013>
55. Van Dyke N, Drinkwater EJ (2022) Intuitive eating is positively associated with indicators of physical and mental health among rural Australian adults. *Aust J Rural Health* 30:468–477. <https://doi.org/10.1111/ajr.12856>
56. Wan Wahida WMZ, Lai PSM, Abdul Hadi H (2017) Validity and reliability of the English version of the sick, control, one stone, fat, food (SCOFF) in Malaysia. *Clin Nutr ESPEN* 18:55–58. <https://doi.org/10.1016/j.clnesp.2017.02.001>
57. Zickgraf HF, Hazzard VM, O'Connor SM (2022) Food insecurity is associated with eating disorders independent of depression and

- anxiety: findings from the 2020–2021 healthy minds study. *Int J Eat Disord* 55:354–361. <https://doi.org/10.1002/eat.23668>
58. Goldstone AP, Prechtl De Hernandez CG, Beaver JD et al (2009) Fasting biases brain reward systems towards high-calorie foods. *Eur J Neurosci* 30:1625–1635. <https://doi.org/10.1111/j.1460-9568.2009.06949.x>
  59. Khalil RB, Dagher R, Zarzour M et al (2022) The impact of lockdown and other stressors during the COVID-19 pandemic on depression and anxiety in a Lebanese opportunistic sample: an online cross-sectional survey. *Curr Psychol*. <https://doi.org/10.1007/s12144-021-02644-0>
  60. Azzouzi N, Ahid S, Bragazzi NL et al (2019) Eating disorders among Moroccan medical students: cognition and behavior. *Psychol Res Behav Manag* 12:129–135. <https://doi.org/10.2147/PRBM.S165114>
  61. Bizri M, Geagea L, Kobeissy F, Talih F (2020) Prevalence of eating disorders among medical students in a Lebanese medical school: a cross-sectional study. *Neuropsychiatr Dis Treat* 16:1879–1887. <https://doi.org/10.2147/NDT.S266241>
  62. Di Lodovico L, Dubertret C, Ameller A (2018) Vulnerability to exercise addiction, socio-demographic, behavioral and psychological characteristics of runners at risk for eating disorders. *Compr Psychiatry* 81:48–52. <https://doi.org/10.1016/j.comppsych.2017.11.006>
  63. Esteban-Gonzalo L, Veiga OL, Gómez-Martínez S et al (2014) Length of residence and risk of eating disorders in immigrant adolescents living in Madrid; the AFINOS study. *Nutr Hosp* 29:1047–1053. <https://doi.org/10.3305/nh.2014.29.5.7387>
  64. Fragkos KC, Frangos CC (2013) Assessing eating disorder risk: the pivotal role of achievement anxiety, depression and female gender in non-clinical samples. *Nutrients* 5:811–828. <https://doi.org/10.3390/nu5030811>
  65. Ganson KT, Nagata JM (2021) Associations between vaping and eating disorder diagnosis and risk among college students. *Eat Behav* 43:101566. <https://doi.org/10.1016/j.eatbeh.2021.101566>
  66. Garrido-Miguel M, Torres-Costoso A, Martínez-Andrés M et al (2019) The risk of eating disorders and bone health in young adults: the mediating role of body composition and fitness. *Eat Weight Disord* 24:1145–1154. <https://doi.org/10.1007/s40519-017-0458-x>
  67. Hazzard VM, Simone M, Borg SL et al (2020) Disparities in eating disorder risk and diagnosis among sexual minority college students: findings from the national healthy minds study. *Int J Eat Disord* 53:1563–1568. <https://doi.org/10.1002/eat.23304>
  68. Chan MMH, Zarate-Lopez N, Martin L (2022) Group education on the low FODMAP diet improves gastrointestinal symptoms but neither anxiety or depression in irritable bowel syndrome. *J Hum Nutr Diet* 35:425–434. <https://doi.org/10.1111/jhn.12951>
  69. Mari A, Hosadurg D, Martin L et al (2019) Adherence with a low-FODMAP diet in irritable bowel syndrome: are eating disorders the missing link? *Eur J Gastroenterol Hepatol* 31:178–182. <https://doi.org/10.1097/MEG.0000000000001317>
  70. Memon AA, Adil SE-E-R, Siddiqui EU et al (2012) Eating disorders in medical students of Karachi, Pakistan—a cross-sectional study. *BMC Res Notes* 5:84. <https://doi.org/10.1186/1756-0500-5-84>
  71. Pustivšek S, Hadžić V, Dervišević E, Carruthers J (2020) Risk for eating disorders and body composition among adolescent female and male athletes and non-athlete controls. *Int J Adolesc Med Health* 32:20170190. <https://doi.org/10.1515/ijamh-2017-0190>
  72. Pustivšek S, Hadžić V, Dervišević E (2015) Risk factors for eating disorders among male adolescent athletes. *Zdr Varst* 54:58–65. <https://doi.org/10.1515/sjph-2015-0008>
  73. Tavolacci MP, Grigioni S, Richard L et al (2015) Eating disorders and associated health risks among university students. *J Nutr Educ Behav* 47:412–420.e1. <https://doi.org/10.1016/j.jneb.2015.06.009>
  74. Vila-Martí A, Elío I, Sumalla-Cano S (2021) Eating behavior during first-year college students, including eating disorders—RUVIC-RUNEAT-TCA project. Protocol of an observational multicentric study. *Int J Environ Res Public Health* 18:9457. <https://doi.org/10.3390/ijerph18189457>
  75. Zeeni N, Doumit R, Kharma JA, Sanchez-Ruiz M-J (2018) Media, technology use, and attitudes: associations with physical and mental well-being in youth with implications for evidence-based practice. *Worldviews Evid Based Nurs* 15:304–312. <https://doi.org/10.1111/wvn.12298>
  76. Adelantado-Renau M, Beltran-Valls MR, Toledo-Bonifás M et al (2018) The risk of eating disorders and academic performance in adolescents: DADOS study. *Nutr Hosp* 35:1201–1207. <https://doi.org/10.20960/nh.1778>
  77. Aoun A, Joundi J, El Gerges N (2019) Prevalence and correlates of a positive screen for eating disorders among Syrian refugees. *Eur Eat Disord Rev* 27:263–273. <https://doi.org/10.1002/erv.2660>
  78. Bou Khalil R, Bou-Orm IR, Tabet Y et al (2020) Disgust and fear: common emotions between eating and phobic disorders. *Eat Weight Disord* 25:79–86. <https://doi.org/10.1007/s40519-018-0512-3>
  79. Czeglédi E, Szabo K (2016) Hungarian experiences with the beliefs about attractiveness scale. *Clin Neurosci* 69:98–105. <https://doi.org/10.18071/isz.69.0098>
  80. Jantzer V, Groß J, Stute F et al (2013) Risk behaviors and externalizing behaviors in adolescents dealing with parental cancer—a controlled longitudinal study. *Psychooncology* 22:2611–2616. <https://doi.org/10.1002/pon.3327>
  81. Kropiewski Z, Szcześniak M, Furmańska J, Gójska A (2019) Assessment of family functioning and eating disorders—the mediating role of self-esteem. *Front Psychol* 10:407456. <https://doi.org/10.3389/fpsyg.2019.00921>
  82. Leung SF, Joyce Ma LC, Russell J (2013) An open trial of self-help behaviours of clients with eating disorders in an online programme. *J Adv Nurs* 69:66–76. <https://doi.org/10.1111/J.1365-2648.2012.05988.X>
  83. Lichtenstein MB, Griffiths MD, Hemmingsen SD, Støving RK (2018) Exercise addiction in adolescents and emerging adults—validation of a youth version of the exercise addiction inventory. *J Behav Addict* 7:117–125. <https://doi.org/10.1556/2006.7.2018.01>
  84. Martínez-Gómez D, Veses AM, Gómez-Martínez S et al (2015) Television viewing time and risk of eating disorders in Spanish adolescents: AVENA and AFINOS studies. *Pediatr Int* 57:455–460. <https://doi.org/10.1111/ped.12662>
  85. Muros JJ, Ávila-Alche Á, Knox E, Zabala M (2020) Likelihood of suffering from an eating disorder in a sample of Spanish cyclists and triathletes. *J Eat Disord*. <https://doi.org/10.1186/s40337-020-00350-z>
  86. Robert M, Buscail C, Allès B et al (2020) Dispositional optimism is associated with weight status, eating behavior, and eating disorders in a general population-based study. *Int J Eat Disord* 53:1696–1708. <https://doi.org/10.1002/eat.23347>
  87. Sharifian MJ, Pohjola V, Kunttu K, Virtanen JJ (2021) Association between dental fear and eating disorders and body mass index among Finnish university students: a national survey. *BMC Oral Health* 21:93. <https://doi.org/10.1186/s12903-021-01449-8>
  88. Veses AM, Martínez-Gómez D, Gómez-Martínez S et al (2014) Physical fitness, overweight and the risk of eating disorders in adolescents. The AVENA and AFINOS studies. *Pediatr Obes* 9:1–9. <https://doi.org/10.1111/j.2047-6310.2012.00138.x>
  89. Veses AM, Gómez-Martínez S, de Heredia FP et al (2015) Cognition and the risk of eating disorders in Spanish adolescents:



- the AVENA and AFINOS studies. *Eur J Pediatr* 174:229–236. <https://doi.org/10.1007/s00431-014-2386-3>
90. Vijayalakshmi P, Thimmaiah R, Reddy SSN et al (2017) Gender differences in body mass index, body weight perception, weight satisfaction, disordered eating and weight control strategies among Indian medical and nursing undergraduates. *Invest Educ Enferm* 35:276–284. <https://doi.org/10.17533/udea.iee.v35n3a04>
91. Vijayalakshmi P, Thimmaiah R, Gandhi S, BadaMath S (2018) Eating attitudes, weight control behaviors, body image satisfaction and depression level among Indian medical and nursing undergraduate students. *Community Ment Health J* 54:1266–1273. <https://doi.org/10.1007/s10597-018-0333-x>
92. Andreeva VA, Tavolacci MP, Galan P et al (2019) Sociodemographic correlates of eating disorder subtypes among men and women in France, with a focus on age. *J Epidemiol Community Health* 73:56–64. <https://doi.org/10.1136/jech-2018-210745>
93. Bächle C, Lange K, Stahl-Pehe A et al (2015) Symptoms of eating disorders and depression in emerging adults with early-onset, long-duration type 1 diabetes and their association with metabolic control. *PLoS ONE* 10:e0131027. <https://doi.org/10.1371/journal.pone.0131027>
94. Bénard M, Bellisle F, Kesse-Guyot E et al (2019) Impulsivity is associated with food intake, snacking, and eating disorders in a general population. *Am J Clin Nutr* 109:117–126. <https://doi.org/10.1093/ajcn/nqy255>
95. Coffino JA, Hormes JM (2018) A default option to enhance nutrition within financial constraints: a randomized, controlled proof-of-principle trial. *Obesity* 26:961–967. <https://doi.org/10.1002/oby.22151>
96. Damiri B, Safarini OA, Nazzal Z et al (2021) Eating disorders and the use of cognitive enhancers and psychostimulants among university students: a cross-sectional study. *Neuropsychiatr Dis Treat* 17:1633–1645. <https://doi.org/10.2147/NDT.S308598>
97. Dooley-Hash S, Adams M, Walton MA et al (2019) The prevalence and correlates of eating disorders in adult emergency department patients. *Int J Eat Disord* 52:1281–1290. <https://doi.org/10.1002/eat.23140>
98. Falvey SE, Hahn SL, Anderson OS et al (2021) Diagnosis of eating disorders among college students: a comparison of military and civilian students. *Mil Med* 186:975–983. <https://doi.org/10.1093/milmed/usab084>
99. Farrow CV, Blissett JM (2005) Is maternal psychopathology related to obesigenic feeding practices at 1 year? *Obes Res* 13:1999–2005. <https://doi.org/10.1038/oby.2005.245>
100. Ganson KT, Cunningham ML, Murray SB, Nagata JM (2022) Use of appearance and performance enhancing drugs and substances is associated with eating disorder symptomatology among U.S. college students. *Eat Weight Disord Stud Anorex Bulim Obes* 27:2245–2250. <https://doi.org/10.1007/s40519-022-01364-z>
101. Grüneis V, Schweiger K, Galassi C et al (2021) Sweetness perception is not involved in the regulation of blood glucose after oral application of sucrose and glucose solutions in healthy male subjects. *Mol Nutr Food Res* 65:2000472. <https://doi.org/10.1002/mnfr.202000472>
102. Herpertz-Dahlmann B, Dempfle A, Konrad K et al (2015) Eating disorder symptoms do not just disappear: the implications of adolescent eating-disordered behaviour for body weight and mental health in young adulthood. *Eur Child Adolesc Psychiatry* 24:675–684. <https://doi.org/10.1007/s00787-014-0610-3>
103. Hochkogler CM, Rohm B, Hojdar K et al (2014) The capsaicin analog nonivamide decreases total energy intake from a standardized breakfast and enhances plasma serotonin levels in moderately overweight men after administered in an oral glucose tolerance test: a randomized, crossover trial. *Mol Nutr Food Res* 58:1282–1290. <https://doi.org/10.1002/mnfr.201300821>
104. Hochkogler CM, Lieder B, Rust P et al (2017) A 12-week intervention with nonivamide, a TRPV1 agonist, prevents a dietary-induced body fat gain and increases peripheral serotonin in moderately overweight subjects. *Mol Nutr Food Res* 61:1600731. <https://doi.org/10.1002/mnfr.201600731>
105. Kenny TE, Carter JC (2018) I weigh therefore I am: implications of using different criteria to define overvaluation of weight and shape in binge-eating disorder. *Int J Eat Disord* 51:1244–1251. <https://doi.org/10.1002/eat.22956>
106. Kenny TE, Van Wijk M, Singleton C, Carter JC (2018) An examination of the relationship between binge eating disorder and insomnia symptoms. *Eur Eat Disord Rev* 26:186–196. <https://doi.org/10.1002/ERV.2587>
107. Kenny TE, Singleton C, Carter JC (2017) Testing predictions of the emotion regulation model of binge-eating disorder. *Int J Eat Disord* 50:1297–1305. <https://doi.org/10.1002/eat.22787>
108. Kronfol Z, Khalifa B, Khoury B et al (2018) Selected psychiatric problems among college students in two Arab countries: comparison with the USA. *BMC Psychiatry* 18:1–9. <https://doi.org/10.1186/s12888-018-1718-7>
109. Leung SF, Ma J, Russell J (2013) Enhancing motivation to change in eating disorders with an online self-help program. *Int J Ment Health Nurs* 22:329–339. <https://doi.org/10.1111/j.1447-0349.2012.00870.x>
110. Maïmoun L, Guillaume S, Lefebvre P et al (2018) Effects of the two types of anorexia nervosa (binge eating/purging and restrictive) on bone metabolism in female patients. *Clin Endocrinol* 88:863–872. <https://doi.org/10.1111/cen.13610>
111. McBride O, McManus S, Thompson J et al (2013) Profiling disordered eating patterns and body mass index (BMI) in the English general population. *Soc Psychiatry Psychiatr Epidemiol* 48:783–793. <https://doi.org/10.1007/s00127-012-0613-7>
112. Melchior C, Desprez C, Riachi G et al (2019) Anxiety and depression profile is associated with eating disorders in patients with irritable bowel syndrome. *Front Psychiatry* 10:928. <https://doi.org/10.3389/fpsy.2019.00928>
113. Patmore J, Meddaoui B, Feldman H (2019) Cultural considerations for treating Hispanic patients with eating disorders: a case study illustrating the effectiveness of CBT in reducing bulimia nervosa symptoms in a Latina patient. *J Clin Psychol* 75:2006–2021. <https://doi.org/10.1002/jclp.22860>
114. Romo L, Ladner J, Kotbagi G et al (2018) Attention-deficit hyperactivity disorder and addictions (substance and behavioral): prevalence and characteristics in a multicenter study in France. *J Behav Addict* 7:743–751. <https://doi.org/10.1556/2006.7.2018.58>
115. Rothschild-Yakar L, Goshen D, Enoch-Levy A et al (2022) General mentalizing, emotional theory of mind and interpersonal mistrust in anorexia nervosa: the validation of the Hebrew version of the Cambridge mindreading face-task. *Clin Psychol Psychother* 29:240–249. <https://doi.org/10.1002/cpp.2626>
116. Safer M, Zemni I, Mili M et al (2020) Eating disorders: prevalence and associated factors among health occupation students in Monastir university (Tunisia). *Tunis Med* 98:895–912
117. Spillebout A, Dechelotte P, Ladner J, Tavolacci MP (2019) Mental health among university students with eating disorders and irritable bowel syndrome in France. *Rev Epidemiol Sante Publique* 67:295–301. <https://doi.org/10.1016/j.respe.2019.04.056>
118. Tavolacci MP, Gillibert A, Zhu Soubise A et al (2019) Screening four broad categories of eating disorders: suitability of a clinical algorithm adapted from the SCOFF questionnaire. *BMC Psychiatry* 19:1–7. <https://doi.org/10.1186/s12888-019-2338-6>
119. Tavolacci MP, Déchelotte P, Ladner J (2020) Eating disorders among college students in France: characteristics, help-and

- care-seeking. *Int J Environ Res Public Health* 17:1–11. <https://doi.org/10.3390/ijerph17165914>
120. Tavoracci MP, Ladner J, Déchelotte P (2021) Sharp increase in eating disorders among university students since the covid-19 pandemic. *Nutrients* 13:3415. <https://doi.org/10.3390/nu13103415>
  121. Tavoracci MP, Ladner J, Dechelotte P (2021) COVID-19 pandemic and eating disorders among university students. *Nutrients* 13:4294. <https://doi.org/10.3390/nu13124294>
  122. Wróblewska B, Szyc AM, Markiewicz LH et al (2018) Increased prevalence of eating disorders as a biopsychosocial implication of food allergy. *PLoS ONE* 13:e0198607. <https://doi.org/10.1371/journal.pone.0198607>
  123. Alcaraz-Ibáñez M, Paterna A, Griffiths MD, Sicilia Á (2020) Examining the role of social physique anxiety on the relationship between physical appearance comparisons and disordered eating symptoms among Spanish emerging adults. *Scand J Psychol* 61:803–808. <https://doi.org/10.1111/sjop.12663>
  124. Ammann S, André Berchtold B, Barrense-Dias Y et al (2018) Disordered eating: the young male side. *Behav Med* 44:289–296. <https://doi.org/10.1080/08964289.2017.1341383>
  125. Bächle C, Stahl-Pehe A, Rosenbauer J (2016) Disordered eating and insulin restriction in youths receiving intensified insulin treatment: results from a nationwide population-based study. *Int J Eat Disord* 49:193–198. <https://doi.org/10.1002/eat.22463>
  126. Baechle C, Castillo K, Straßburger K et al (2014) Is disordered eating behavior more prevalent in adolescents with early-onset type 1 diabetes than in their representative peers? *Int J Eat Disord* 47:342–352. <https://doi.org/10.1002/eat.22238>
  127. Baechle C, Hoyer A, Stahl-Pehe A et al (2019) Course of disordered eating behavior in young people with early-onset type 1 diabetes: prevalence, symptoms, and transition probabilities. *J Adolesc Health* 65:681–689. <https://doi.org/10.1016/j.jadohealth.2019.05.016>
  128. Berger U, Schaefer JM, Wick K et al (2014) Effectiveness of reducing the risk of eating-related problems using the German school-based intervention program, “Torera”, for preadolescent boys and girls. *Prev Sci* 15:557–569. <https://doi.org/10.1007/s11121-013-0396-4>
  129. Elran-Barak R, Bromberg M, Shimony T et al (2020) Disordered eating among Arab and Jewish youth in Israel: the role of eating dinner with the family. *Isr J Health Policy Res* 9:1–11. <https://doi.org/10.1186/s13584-020-00388-z>
  130. Feng T, Abebe DS (2017) Eating behaviour disorders among adolescents in a middle school in Dongfanghong, China. *J Eat Disord*. <https://doi.org/10.1186/s40337-017-0175-x>
  131. Hansson E, Daukantaitė D, Johnsson P (2015) SCOFF in a general Swedish adolescent population. *J Eat Disord*. <https://doi.org/10.1186/s40337-015-0087-6>
  132. Hansson E, Daukantaitė D, Johnsson P (2016) Typical patterns of disordered eating among Swedish adolescents: associations with emotion dysregulation, depression, and self-esteem. *J Eat Disord* 4:28. <https://doi.org/10.1186/s40337-016-0122-2>
  133. Hansson E, Daukantaitė D, Johnsson P (2017) Disordered eating and emotion dysregulation among adolescents and their parents. *BMC Psychol*. <https://doi.org/10.1186/s40359-017-0180-5>
  134. Herpertz-Dahlmann B, Wille N, Hölling H et al (2008) Disordered eating behaviour and attitudes, associated psychopathology and health-related quality of life: results of the BELLA study. *Eur Child Adolesc Psychiatry* 17:82–91. <https://doi.org/10.1007/s00787-008-1009-9>
  135. Jacob L, Haro JM, Koyanagi A (2018) Attention deficit hyperactivity disorder symptoms and disordered eating in the English general population. *Int J Eat Disord* 51:942–952. <https://doi.org/10.1002/eat.22934>
  136. Johnston O, Fornai G, Cabrini S, Kendrick T (2007) Feasibility and acceptability of screening for eating disorders in primary care. *Fam Pract* 24:511–517. <https://doi.org/10.1093/fampra/cmm029>
  137. Kaluski DN, Natamba B, Goldsmith R et al (2008) Determinants of disordered eating behaviors among Israeli adolescent girls. *Eat Disord* 16:146–159. <https://doi.org/10.1080/10640260801887303>
  138. Ko N, Tam DM, Viet NK et al (2015) Disordered eating behaviors in university students in Hanoi, Vietnam. *J Eat Disord* 3:1–7. <https://doi.org/10.1186/s40337-015-0054-2>
  139. Lommi S, Viljakainen HT, Weiderpass E, de Oliveira Figueiredo RA (2020) Children’s eating attitudes test (ChEAT): a validation study in Finnish children. *Eat Weight Disord* 25:961–971. <https://doi.org/10.1007/s40519-019-00712-w>
  140. Martin E, Dourish CT, Hook R et al (2020) Associations between inattention and impulsivity ADHD symptoms and disordered eating risk in a community sample of young adults. *Psychol Med*. <https://doi.org/10.1017/S0033291720004638>
  141. Peat CM, Von Holle A, Watson H et al (2015) The association between internet and television access and disordered eating in a Chinese sample. *Int J Eat Disord* 48:663–669. <https://doi.org/10.1002/EAT.22359>
  142. Petisco-Rodríguez C, Sánchez-Sánchez LC, Fernández-García R et al (2020) Disordered eating attitudes, anxiety, self-esteem and perfectionism in young athletes and non-athletes. *Int J Environ Res Public Health* 17:1–18. <https://doi.org/10.3390/ijerph17186754>
  143. Philipp J, Zeiler M, Waldherr K et al (2014) The mental health in Austrian teenagers (MHAT)-study: preliminary results from a pilot study. *Neuropsychiatrie* 28:198–207. <https://doi.org/10.1007/s40211-014-0131-9>
  144. Richter F, Strauss B, Braehler E et al (2017) Screening disordered eating in a representative sample of the German population: usefulness and psychometric properties of the German SCOFF questionnaire. *Eat Behav* 25:81–88. <https://doi.org/10.1016/j.eatbeh.2016.06.022>
  145. Saleh RN, Salameh RA, Yhya HH, Sweileh WM (2018) Disordered eating attitudes in female students of An-Najah National University: a cross-sectional study. *J Eat Disord* 6:1–6. <https://doi.org/10.1186/s40337-018-0204-4>
  146. Solmi F, Hatch SL, Hotopf M et al (2014) Prevalence and correlates of disordered eating in a general population sample: the South East London Community Health (SELCoH) study. *Soc Psychiatry Psychiatr Epidemiol* 49:1335–1346. <https://doi.org/10.1007/s00127-014-0822-3>
  147. Štefanová E, Bakalár P, Baška T (2020) Eating-disordered behavior in adolescents: associations with body image, body composition and physical activity. *Int J Environ Res Public Health* 17:6665. <https://doi.org/10.3390/ijerph17186665>
  148. Strand M, von Hausswolff-Juhlin Y, Fredlund P, Lager A (2019) Symptoms of disordered eating among adult international adoptees: a population-based cohort study. *Eur Eat Disord Rev* 27:236–246. <https://doi.org/10.1002/erv.2653>
  149. Watson HJ, Hamer RM, Thornton LM et al (2015) Prevalence of screening-detected eating disorders in Chinese females and exploratory associations with dietary practices. *Eur Eat Disord Rev* 23:68–76. <https://doi.org/10.1002/erv.2334>
  150. Yao S, Zhang R, Thornton LM et al (2021) Screen-detected disordered eating and related traits in a large population sample of females in mainland China: China health and nutrition survey. *Int J Eat Disord* 54:24–35. <https://doi.org/10.1002/eat.23409>
  151. Zeiler M, Waldherr K, Philipp J et al (2016) Prevalence of eating disorder risk and associations with health-related quality of life: results from a large school-based population screening. *Eur Eat Disord Rev* 24:9–18. <https://doi.org/10.1002/erv.2368>

152. D'Anna G, Lazzeretti M, Castellini G et al (2021) Risk of eating disorders in a representative sample of Italian adolescents: prevalence and association with self-reported interpersonal factors. *Eat Weight Disord*. <https://doi.org/10.1007/s40519-021-01214-4>
153. Galvão PPDO, Valente JY, Almeida MC et al (2021) Being bullied and using drugs are associated with eating disorder symptoms in Brazilian students. *Int J Eat Disord* 54:445–450. <https://doi.org/10.1002/eat.23436>
154. Giel KE, Zipfel S, Schweizer R et al (2013) Eating disorder pathology in adolescents participating in a lifestyle intervention for obesity: associations with weight change, general psychopathology and health-related quality of life. *Obes Facts* 6:307–316. <https://doi.org/10.1159/000354534>
155. Gilon Mann T, Hamdan S, Bar-Haim Y et al (2018) Different attention bias patterns in anorexia nervosa restricting and binge/purge types. *Eur Eat Disord Rev* 26:293–301. <https://doi.org/10.1002/erv.2593>
156. Hautala L, Junnila J, Helenius H et al (2008) Adolescents with fluctuating symptoms of eating disorders: a 1-year prospective study. *J Adv Nurs* 62:674–680. <https://doi.org/10.1111/j.1365-2648.2008.04697.x>
157. Hautala LA, Junnila J, Helenius H et al (2008) Towards understanding gender differences in disordered eating among adolescents. *J Clin Nurs* 17:1803–1813. <https://doi.org/10.1111/j.1365-2702.2007.02143.x>
158. Hautala L, Junnila J, Alin J et al (2009) Uncovering hidden eating disorders using the SCOFF questionnaire: cross-sectional survey of adolescents and comparison with nurse assessments. *Int J Nurs Stud* 46:1439–1447. <https://doi.org/10.1016/j.ijnurstu.2009.04.007>
159. Hautala L, Helenius H, Karukivi M et al (2011) The role of gender, affectivity and parenting in the course of disordered eating: a 4-year prospective case-control study among adolescents. *Int J Nurs Stud* 48:959–972. <https://doi.org/10.1016/j.ijnurstu.2011.01.014>
160. Karukivi M, Hautala L, Korpelainen J et al (2010) Alexithymia and eating disorder symptoms in adolescents. *Eat Disord* 18:226–238. <https://doi.org/10.1080/10640261003719518>
161. Lenk M, Noack B, Weidner K, Lorenz K (2022) Psychopathologies and socioeconomic status as risk indicators for periodontitis: a survey-based investigation in German dental practices. *Clin Oral Investig* 26:2853–2862. <https://doi.org/10.1007/s00784-021-04263-2>
162. Lipson SK, Sonnevile KR (2020) Understanding suicide risk and eating disorders in college student populations: results from a national study. *Int J Eat Disord* 53:229–238. <https://doi.org/10.1002/EAT.23188>
163. Noma S, Nakai Y, Hamagaki S et al (2006) Comparison between the SCOFF questionnaire and the eating attitudes test in patients with eating disorders. *Int J Psychiatry Clin Pract* 10:27–32. <https://doi.org/10.1080/13651500500305275>
164. Peters EM, Bowen R, Balbuena L (2019) Mood instability contributes to impulsivity, non-suicidal self-injury, and binge eating/purging in people with anxiety disorders. *Psychol Psychother Theory Res Pract* 92:422–438. <https://doi.org/10.1111/papt.12192>
165. Purcell R, Jorm AF, Hickie IB et al (2015) Transitions study of predictors of illness progression in young people with mental ill health: study methodology. *Early Interv Psychiatry* 9:38–47. <https://doi.org/10.1111/eip.12079>
166. Robert M, Shankland R, Andreeva VA et al (2022) Resilience is associated with less eating disorder symptoms in the NutriNet-Santé cohort study. *Int J Environ Res Public Health* 19:1471. <https://doi.org/10.3390/ijerph19031471>
167. Šablaturová N, Gottfried J, Blinka L et al (2021) Eating disorders symptoms and excessive internet use in adolescents: the role of internalising and externalising problems. *J Eat Disord* 9:1–8. <https://doi.org/10.1186/s40337-021-00506-5>
168. Zarychta K, Luszczynska A, Scholz U (2014) The association between automatic thoughts about eating, the actual-ideal weight discrepancies, and eating disorders symptoms: a longitudinal study in late adolescence. *Eat Weight Disord* 19:199–207. <https://doi.org/10.1007/s40519-014-0099-2>
169. Zeiler M, Philipp J, Truttmann S et al (2021) Psychopathological symptoms and well-being in overweight and underweight adolescents: a network analysis. *Nutrients* 13:4096. <https://doi.org/10.3390/nu13114096>
170. Dooley-Hash S, Banker JD, Walton MA et al (2012) The prevalence and correlates of eating disorders among emergency department patients aged 14–20 years. *Int J Eat Disord* 45:883–890. <https://doi.org/10.1002/eat.22026>
171. Giel KE, Hermann-Werner A, Mayer J et al (2016) Eating disorder pathology in elite adolescent athletes. *Int J Eat Disord* 49:553–562. <https://doi.org/10.1002/eat.22511>
172. Ho AS, Soh NL, Walter G, Touyz S (2011) Comparison of nutrition knowledge among health professionals, patients with eating disorders and the general population. *Nutr Diet* 68:267–272. <https://doi.org/10.1111/j.1747-0080.2011.01549.x>
173. Sidani JE, Shensa A, Hoffman B et al (2016) The association between social media use and eating concerns among US young adults. *J Acad Nutr Diet* 116:1465–1472. <https://doi.org/10.1016/j.jand.2016.03.021>
174. Eisenberg D, Golberstein E, Whitlock JL, Downs MF (2013) Social contagion of mental health: evidence from college roommates. *Health Econ* 22:965–986. <https://doi.org/10.1002/hec.2873>
175. Piacentino D, Sani G, Kotzalidis GD et al (2022) Anabolic androgenic steroids used as performance and image enhancing drugs in professional and amateur athletes: toxicological and psychopathological findings. *Hum Psychopharmacol* 37:e2815. <https://doi.org/10.1002/hup.2815>
176. Piacentino D, Kotzalidis GD, Longo L et al (2017) Body image and eating disorders are common among professional and amateur athletes using performance and image enhancing drugs: a cross-sectional study. *J Psychoact Drugs* 49:373–384. <https://doi.org/10.1080/02791072.2017.1359708>
177. Rodríguez Martín A, Novalbos Ruiz JP, Martínez Nieto JM et al (2004) Epidemiological study of the influence of family and socioeconomic status in disorders of eating behaviour. *Eur J Clin Nutr* 58:846–852. <https://doi.org/10.1038/sj.ejcn.1601884>
178. Rodríguez Martín A, Novalbos Ruiz JP, Martínez Nieto JM et al (2005) Characteristics of eating disorders in a university hospital-based Spanish population. *Eur J Clin Nutr* 59:459–462. <https://doi.org/10.1038/sj.ejcn.1602095>
179. Sanchez-Armass O, Raffaelli M, Andrade FCD et al (2017) Validation of the SCOFF questionnaire for screening of eating disorders among Mexican university students. *Eat Weight Disord* 22:153–160. <https://doi.org/10.1007/s40519-016-0259-7>
180. Toromanyan E, Aslanyan G, Amroyan E et al (2007) Efficacy of Slim339® in reducing body weight of overweight and obese human subjects. *Phytother Res* 21:1177–1181. <https://doi.org/10.1002/ptr.2231>
181. Calcaterra V, Mazzoni C, Ballardini D et al (2020) Disturbed eating behaviors in youth with type 1 diabetes: an exploratory study about challenges in diagnosis. *Diagnostics* 10:1044. <https://doi.org/10.3390/diagnostics10121044>
182. Hefner J, Eisenberg D (2009) Social support and mental health among college students. *Am J Orthopsychiatry* 79:491–499. <https://doi.org/10.1037/a0016918>
183. Hicks TM, Roberts MW, Lee JY et al (2013) Knowledge and practice of eating disorders among a group of adolescent dental

- patients. *J Clin Pediatr Dent* 38:39–43. <https://doi.org/10.17796/jcpd.38.1.p764642162107355>
184. Barry MR, Sonnevile KR, Leung CW (2021) Students with food insecurity are more likely to screen positive for an eating disorder at a large, public university in the Midwest. *J Acad Nutr Diet* 121:1115–1124. <https://doi.org/10.1016/j.jand.2021.01.025>
185. Purcell R, Jorm AF, Hickie IB et al (2015) Demographic and clinical characteristics of young people seeking help at youth mental health services: baseline findings of the transitions study. *Early Interv Psychiatry* 9:487–497. <https://doi.org/10.1111/eip.12133>
186. Wright F, Bewick BM, Barkham M et al (2009) Co-occurrence of self-reported disordered eating and self-harm in UK university students. *Br J Clin Psychol* 48:397–410. <https://doi.org/10.1348/014466509X410343>
187. Conceição EM, Gomes FVS, Vaz AR et al (2017) Prevalence of eating disorders and picking/nibbling in elderly women. *Int J Eat Disord* 50:793–800. <https://doi.org/10.1002/eat.22700>
188. Eisenberg D, Nicklett EJ, Roeder K, Kirz NE (2011) Eating disorder symptoms among college students: prevalence, persistence, correlates, and treatment-seeking. *J Am Coll Health* 59:700–707. <https://doi.org/10.1080/07448481.2010.546461>
189. Moser CM, Terra L, Behenck AdS et al (2020) Cross-cultural adaptation and translation into Brazilian Portuguese of the instruments sick control one stone fat food questionnaire (SCOFF), eating disorder examination questionnaire (EDE-q) and clinical impairment assessment questionnaire (CIA). *Trends Psychiatry Psychother* 42:267–271. <https://doi.org/10.1590/2237-6089-2019-0083>
190. Alcaraz-Ibáñez M, Sicilia Á, Paterna A (2019) Exploring the differentiated relationship between appearance and fitness-related social anxiety and the risk of eating disorders and depression in young adults. *Scand J Psychol* 60:569–576. <https://doi.org/10.1111/sjop.12584>
191. Kabakuş Aykut M, Bilici S (2022) The relationship between the risk of eating disorder and meal patterns in university students. *Eat Weight Disord* 27:579–587. <https://doi.org/10.1007/s40519-021-01179-4>
192. Bakalar JL, Shank LM, Vannucci A et al (2015) Recent advances in developmental and risk factor research on eating disorders. *Curr Psychiatry Rep* 17:42. <https://doi.org/10.1007/s11920-015-0585-x>
193. Nurkkala M, Keränen A-M, Koivumaa-Honkanen H et al (2016) Disordered eating behavior, health and motives to exercise in young men: cross-sectional population-based MOPO study. *BMC Public Health* 16:483. <https://doi.org/10.1186/s12889-016-3162-2>
194. Morrison R (2020) One in six adults in England has a possible eating disorder—including almost a third of women aged 16 to 24, study finds. In: MailOnline

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