Original article

The SCOFF score: A screening tool for eating disorders in family practice

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A R T I C L E   I N F O

S U M M A R Y

Background & aims: More than half of individuals with eating disorders (ED) remain undetected in primary care, making a validated screening tool necessary. The aim of the study was to analyze the screening value of the SCOFF questionnaire for women in family practices.
Methods: 150 consecutive women attending their general practitioner (GP) in the south west of France were recruited. The written SCOFF questionnaire was completed, and then concealed in an envelope. The women were then assessed by a clinical interview for the diagnosis with ED DSM-IV criteria. Sensitivity and specificity were evaluated with a ROC curve.
Results: 143 women completed all the questionnaires and interviews. Sixteen % presented with some criteria of the DSM-IV TR ED, while 21 % of the group has a SCOFF score >1. A score > 2 had a sensitivity of 30%, and a specificity of 97%. A score > 1 had a sensitivity of 65%, and a specificity of 87%.
Conclusion: The prevalence of ED in a GP practice is relatively high and the SCOFF score is an easy and helpful screening tool increasing the identification of patients. A score equal to 2 or more has a sensitivity of 65,2% and a specificity of 87,5%. A few questions reflecting pragmatic clinical situations would improve the specificity of the screening.

1. Introduction

Eating disorders (ED) are relatively frequent,[1,2] but convey a high mortality and morbidity[3–5] that can be drastically reduced with effective treatment.[6,7]

The diagnosis of ED is easy when an adolescent girl is referred for severe malnutrition. It is far more difficult in the case of bulimia nervosa when there is no complaint or symptoms and when the weight is in the normal range. The American Psychiatric Association has proposed diagnostic criteria, the latest in the DSM-IV TR, with a DSM V soon to be released.[8] These criteria are helpful in identifying referred patients.

Eating disorders present more often to primary care practitioners, hospital doctors, and occupational health physicians than to psychiatrists trained in case ascertainment. More than half of individuals with an ED remain undetected in primary care[9] because the complaints are not specific, for example depression, anxiety,

and constipation,[10–13] patients do not disclose their symptoms, or the nutritional status does not raise any alarms. The general practitioners (GP) have difficulties in identifying the ED[13,14] but are in a strategic position to detect patients.[13,15]

Screening tests are designed to identify the possibility that a disease might be present. They are the first stage of the diagnostic sequence prompting further assessment and evaluation. Among the screening tests for ED, the SCOFF score is a self-administered questionnaire with 5 questions, with answers scoring 0 or 1. It therefore has the advantage of being more accessible than the classical tools (such as the EDI which, although thorough, is lengthy and more cumbersome to administer). The SCOFF score shows good validity compared with the DSM-IV diagnosis on clinical interview.[16] It was first validated in English and then translated and validated in many languages (French, Italian, Spanish, Finnish, Chinese, etc; 2,).[17–20] The validations have been carried out in specialized ED clinics and on students.[2,18,21,22]

Few studies have been done to screen patients in primary care, on populations with a broader age range, or with non-nutritional complaints. The SCOFF turned out to be easier than the EDE-Q in primary care[23] and equivalent to another short test (ESP; 1). In primary care settings, on populations not seeking dietary

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advice and not consulting for ED, the sensitivity of the SCOFF score is 72—94.6%, and the specificity is 73—94.8%.[1,2,15,16,23]

The aim of the present study was to analyze the screening value of the SCOFF score in family practices with women visiting their GP for reasons unrelated to body-image or weight or dietary concerns.

2. Methods

2.1. Participants

All women visiting the GP for them or for their child were included, unless they did not speak French fluently, had a known ED, or were <15, or >50 yrs. Fifteen women refused to participate mainly for lack of time, or lack of interest. The sample size was calculated to get a half width of ±5% for the 95% confidence interval [CI] of specificity, and a half width of ±30% for the 95% CI of sensitivity. According to Garcia et al,[24] sensitivity and specificity of the SCOFF questionnaire were both expected to be close to 95% and the prevalence of ED should be approximately 10%. Based on these assumptions, a sample size of 140 patients would consist of 14 patients with ED and 126 patients without ED; a specificity of 95% could be estimated with a 95% CI of [90—98%] and a sensitivity of 95% could be estimated with a 95% CI of [66—100%].

In total, 143 patients completed all the questionnaires and interviews.

The protocol consisted of recruiting consecutive women attending their GP in 3 different places in the south west of France, with 2 GPs per surgery. They gave informed consent to participate in a study that compared the screening value of the SCOFF questionnaire to a semi-structured interview.

2.2. Test methods

The gold standard to establish ED diagnoses is the DSM IV. Thus a semi-structured interview was conducted by the investigator (MLB), later validated by an expert (PR) based on the items of the DSM-IV TR. It was based on the MINI test and the EDE-Q. Patients were then classified as «patients with ED» or «patients without ED».

The written form of the SCOFF questionnaire was used which has a slightly better value than the verbal one.[25] The French version of the SCOFF was used which was validated.[2,24]

A score of 1 was given to each positive answer to the questions. The total score is easy to calculate based on a sum ranging 0—5. The sum of scores was calculated by the investigator (MLB).

The GP diagnosis: the GP had a short list of questions to answer asking whether she/he had a clinical impression that the patient was at risk of an ED, and what she/he would recommend (biological check-up, dedicated consultation later, specialized consultation, no recommendation). This questionnaire was not used for the diagnosis of ED in the study.

Patients first completed the written SCOFF questionnaire that was then concealed in an envelope. The women met the GP the same day for their health complaint, or for that of their child. They then met the investigator (MLB, the same for all patients) who conducted a clinical interview for an eating disorder diagnosis using the ED DSM-IV criteria. MLB was blind to the SCOFF score. The interview was either before or after the meeting with the GP, depending on immediate availability, and in order to reduce the time spent by the women. The GPs were also asked whether they considered the patient was suffering from an ED, based on their clinical notes and impression, but without training them specifically.

2.3. Statistical calculations

The results are presented as mean ± standard deviation (SD). Means were compared using an ANOVA. ROC curve functions of Microsoft XLSTAT 2012 were used to calculate sensitivity and specificity. All others calculations were performed with Statview (Abacus Concept, Ca).

3. Results

Out of 150 patients recruited, 143 completed all the questionnaires and interviews from July 2011 to March 2012. Table 1 shows their characteristics.

The prevalence of eating disorders is shown in Table 2. Sixteen of the cohort ($n = 23$) presented with some of the criteria of the DSM-IV TR ED, while 21% of the group has a SCOFF score greater or equal to 2.

Fig. 1 shows the SCOFF scores depending on the DSM-IV TR categories. Patients with an ED had a significantly greater SCOFF score than patients without an ED. Only one person with bulimia nervosa had a score of 0.

The mean SCOFF score was not influenced by the GPs locations, the marital status of the women, or whether they smoked or took antidepressants.

Forty-one women were overweight or obese, 7 of them with an ED. Thirty-five obese women had no ED at the semi-structured interview, 10 of them with a SCOFF score greater than 2.

Fifteen women were false positive, and scored 2 or more at the SCOFF. The positive items of the score were compared with responses at the interview. It concerned the items O for "one stone weight loss" (2 cases after pregnancy, and 2 cases in overweight subjects on a slimming diet), F for "feeling fat" (in 2 subjects with a BMI greater than 30 and 1 >25 kg/m^2), C for "loss of control" in 11 cases with 5 cases of snacking, and F for "food dominating life" (because of weight concerns in 3 overweight subjects, and because of cooking for their children in one case). When the score was "corrected" to take into account these pitfalls, 15 out of 15 women had a score lower than 2.

Fig. 2 shows the ROC curve for the SCOFF score to screen any of the ED according to DSM-IV TR. Table 3 shows the diagnostic values of the different scores. A score ≥ 3 had a sensitivity of 30%, and a specificity of 97%. A score ≥ 2 had a sensitivity of 65.2%, and a specificity of 87.5%.

4. Discussion

The present study shows that the prevalence of ED in a population of women consulting their family doctor is relatively high, and that the SCOFF score is a useful screening tool with 65.2% sensitivity for a threshold higher or equal to 2.

The study has strengths. It consisted of a sample from a GP practice not selected by consulting for ED. The BMI was in the normal range, as opposed to ED populations where the BMI is lower.[16] The subjects were from all age categories, higher than 15.

Table 1
Patient's characteristics.

	Mean	SD	Range
Age (yrs)	32.9	9.2	15—50
BMI (kg/m^2)	23.4	4.7	16.4—42
SCOFF score	0.82	0.96	0—4

	N	%
Married	103	72
With children	103	72
Smokers	37	26