



A Short Screening Tool for Assessing Disordered Eating Among Prospective and Enrolled Dietetic Majors

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ABSTRACT

Aim: To determine and compare eating behavior and eating attitude of dietetic majors to first year non-dietetic majors from the same university for assessing the prevalence of eating disorders (Eds) used for the development of a short screening tool.

Materials and Methods: A cross-sectional descriptive survey was conducted. Eating behaviour was determined by using the 'Sick, Control, One stone, Fat, Food' (SCOFF) and Eating Attitude Test-26 (EAT-26), while eating attitude was determined with the Three Factor Eating Questionnaire (TFEQ). Descriptive statistics, including independent samples t-tests and chi-square tests were conducted for specificity and sensitivity for the development of a shortened screening tool.

Results and Discussion: Non-dietetic majors had a higher prevalence for Bulimia Nervosa (SCOFF1 - 11%), binge eating (SCOFF2 - 53.7% and EAT A - 22.9%), weight loss (SCOFF3 - 20.7%) and believing themselves to be fat (SCOFF4 - 50%). Dietetic majors had a score indicative of food dominating their lives (SCOFF5 - 41.7%), Bulimia Nervosa (EAT B - 4.2%), using diet pills for weight loss (EAT C - 16.7%) and being previously treated for an ED (EAT D - 8.3%). From the sensitivity and specificity results from the questionnaires used, a combination of questions was generated as a shorter screening tool (ED Questionnaire).

Conclusion: The ED Questionnaire can assist in the selection process of prospective dietetic majors and screen enrolled dietetic majors for the presence of disordered eating symptomatology or an existing ED for referral to the appropriate health professionals for in-depth assessment and treatment, if need be.

Keywords: Eating Behaviour, Eating Attitude, Eating Disorders, Dietetic Majors, Screening tool.

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INTRODUCTION

As healthcare professionals dietitians improve the health of individuals, communities and populations to assess, diagnose and treat dietary and nutritional problems. With the knowledge of biological, behavioural and social sciences [1], they deal with a variety of pathophysiological conditions that require dietary management [2]. Dietetics, as a largely female profession, may be more vulnerable to the influence of the diet industry and media, to modify appearance for societal acceptance [3]. Eating Disorders are

defined by persistent disturbed eating behaviours that result in altered consumption or absorption of food and physical or psychological dysfunction [4, 5]. The prevalence of disordered eating among undergraduate female university students was found not to be an unusual phenomenon but go undiagnosed due to the clinical criteria used for the diagnosis of Eating Disorders [6, 7]. Thus by understanding pre-existing attitudes and beliefs concerning food and eating by students planning to work in the area of Eating Disorders raises questions of possible professional competence and practice upon entering this speciality area, as well as curriculum development prior to entering this practice area [8]. Students training on Nutrition and Dietetics might have obsessions related to body image with young females are more susceptible to Eating Disorders (EDs) and depression [9]. It is hypothesized that a disordered eating attitude might be a motivation

for a student to start a nutrition study program as a coping strategy [10]. International data suggests a higher prevalence of EDs among prospective dietetic students when compared to non-dietetic students [11, 12]. A dietitian who suffers from an ED and then counsels and works with patients who have similar problems, may exacerbate the dietitian's problem and can interfere with the delivery of an effective treatment plan to individuals [13,14].

Currently there is little or no data available to investigate whether this relationship is also true for South African students. But at various German universities, a cross-sectional comparative study was conducted between first year students and students in subsequent years of study, which indicated that nutrition students adopted slightly healthier food choices in the course of their studies and decreased their tendency to be obsessive in their eating behavior [15]. The eating attitudes and behaviours of Australian nutrition and dietetics undergraduate students were compared to students enrolled in occupational therapy, and exploring their possible relationship of disordered eating. A collaborative support mechanism was developed for preventing and managing disordered relationships with food for students enrolled in nutrition degrees to ensure ongoing professional integrity. Potential strategies included early screening, increasing awareness, and promoting healthy eating habits to help treat and prevent the development of disorders or associated health conditions in nutrition and non-nutrition students.

Materials and Methods:

The study population of 145 was conveniently sampled, which included 83 first year female non-dietetic undergraduate students (representing law-, psychology-, drama- and biochemistry students – 57.2% of the study sample), as well as 24 first- 20 third- and 18 fourth year female dietetic undergraduates (42.8% of the study sample) from the University of KwaZulu-Natal, Pietermaritzburg campus in South Africa. A cross-sectional descriptive survey was conducted to determine and compare eating behaviour and eating attitude by using the SCOFF- , EAT-26 questionnaire and TFEQ for data collection. Reliability and validity was ensured throughout the study and the data analysed using SPSS.

Measuring instruments used to determine the prevalence and risk of developing EDs was done by using the SCOFF- [16] and EAT-26 questionnaire [17], focusing on four behavioural questions (EAT A, EAT B, EAT C, EAT D) for this study. The validated TFEQ [18], was used as a measuring instrument to assess student eating attitude.

SCOFF Questionnaire¹⁶

The SCOFF (Sick, Control, One stone, Fat, Food) questionnaire consists of five questions used in this study to screen for EDs. It is simple and easy to apply and score, as it was designed to assess eating behaviour, and the possible risk an individual has of developing an ED. Question one (S = Sick) determines if a person makes themselves sick, to the point of vomiting, because they are feeling uncomfortably full and used as an indication of the development of the ED BN. Question two (C = Control) gives an indication if a person can lose control over how much they eat, thus resulting in binge eating (an ED). Question three (O = One stone = 14 pounds = 6.35kg) give an indication if a person has within the past three months of answering the questionnaire, lost more than 6.35kg of weight, done intentionally or unintentionally. Question Four (F = Fat) investigates if a person believes that they are fat, even when others say that they are thin, which can be seen as perceived body image. Question five (F = Food) gives an indication if food can dominate an individual's life. These five questions were developed to address the core features of AN and BN, calculated by allocating one point for every "yes", as a score of ≥ 2 indicates a likely case of AN or BN. Concluding it as a highly recommended, useful screening tool, used in several languages [19].

Eating Attitudes Test-26 (EAT-26)¹⁷

The EAT-26 questionnaire determines the prevalence of EDs, developed as a screening tool for the diagnosis of eating attitudes characteristic of Anorexia Nervosa (AN) or disordered eating attitudes. The questionnaire was not designed to make a diagnosis of an ED or to take the place of a professional diagnosis or consultation [20]. Consisting of 26 statements an individual must rate on a frequency scale a score of more than 20 indicating the possibility of an eating disorder [21]. The EAT-26 questionnaire also consist of four behavioral questions (EAT A, EAT B, EAT C,

EAT D), to assist in determining eating behavior over the past 6 months prior to answering the questionnaire. The EAT A behavioral question investigates eating binges, indicating not being able to stop eating and eating more than most people under similar circumstances. The EAT B behavioral question investigates whether a person has made themselves sick (vomiting) to change their weight; and in the long term viewed as being indicative of developing BN. The EAT C behavioral questions investigated if a person has used laxatives, diet pills or diuretics to assist in controlling their weight. The EAT D behavioral question investigates whether the person has ever been treated for an eating disorder within the past 6 months, at the time of answering the questionnaire.

Three Factor Eating Questionnaire (TFEQ) ¹⁸

The TFEQ is a validated questionnaire which consists of 51 items arranged into three dimensions of eating behaviour which includes: 1) cognitive eating restraint (21 items); 2) disinhibition of eating (16 items); and 3) perceived hunger (14 items) used to study individuals as well as to detect differences in group eating behaviour, such as university students, with a higher score thus indicating a predisposition. Cognitive eating restraint reflects the extent to which food intake is cognitively

restricted (by thought and will power in order to control body shape and weight). Disinhibition reflects the extent of the inability to control food intake in response to the presence of palatable food which may result in over-consumption. Other disinhibiting stimuli such as emotional stress or social eating cues may contribute to the inability to resist food intake when not hungry. Perceived hunger is to have the realization of being hungry and having food cravings [22].

RESULTS

The frequency of responses (yes or no) for the eating behaviour questionnaires (SCOFF- and eating behaviour questions of the EAT-26 questionnaire) are presented in (Table 1). The behavioural questions (EAT A, EAT B, EAT C, EAT D) of the EAT-26 questionnaire were compared to the results of the SCOFF questionnaire compared to the responses of the study sample (N = 144).

For each of the questions forming part of the SCOFF and EAT-26 questionnaires, the specificity and sensitivity for successfully identifying the presence of an ED is reported in (Table 2). Sensitivity refers to the ability of a diagnostic or screening test to successfully diagnose those with the disease as having the disease, whereas specificity is the extent to

Table 1: Comparison of SCOFF- and EAT-26 questionnaire for dietetic- and non-dietetic students.

EATING BEHAVIOUR	1ST YEAR DIETETIC STUDENTS n= 24		3RD AND 4TH YEAR DIETETIC STUDENTS n = 38		1ST YEAR NON-DIETETIC STUDENTS n = 83		
	N = 144	Yes	No	Yes	No	Yes	No
SCOFF 1 Make yourself sick(vomit)/ Bulimia Nervosa		1 (4.2%)	23 (95.8%)	1 (2.6%)	37 (97.4%)	9 (11%)	73 (89%)
SCOFF 2 Lost control over eating/ Binge Eating		15 (62.5%)	9 (37.5%)	16 (42.1%)	22 (57.9%)	44 (53.7%)	38 (46.3%)
SCOFF 3 Lost more than one stone (15 pound / 6.35kg)		3 (12.5%)	21 (87.5%)	2 (5.3%)	36 (94.7%)	17 (20.7%)	65 (79.3%)
SCOFF 4 Believe yourself to be fat		10 (41.7%)	14 (58.3%)	17 (44.7%)	21 (55.3%)	41 (50%)	41 (50%)
SCOFF 5 Food dominates your life		10 (41.7%)	14 (58.3%)	13 (34.2%)	25 (65.8%)	25 (30.5%)	57 (69.5%)
EAT A Binge eating		3 (12.5%)	21 (87.5%)	10 (26.3%)	28 (73.7%)	19 (22.9%)	63 (75.9%)
EAT B Make yourself sick(vomit) Bulimia Nervosa		1 (4.2%)	23 (95.8%)	6 (15.8%)	32 (84.2%)	3 (3.6%)	79 (95.2%)
EAT C Laxatives, diet pills, diuretics		4 (16.7%)	20 (83.3%)	5 (13.2%)	33 (86.8%)	6 (7.2%)	76 (91.6%)
EAT D Treated for Eating Disorder previously		2 (8.3%)	22 (91.7%)	2 (5.3%)	36 (94.7%)	3 (3.6%)	78 (94%)

Table 2: Comparison of the sensitivity and specificity between the SCOFF- and EAT-26 questionnaires.

EATING BEHAVIOUR	NO EATING DISORDER n = 116		SPECIFICITY (%)	EATING DISORDER (ED) n = 28		SENSITIVITY (%)	PPV (%)
	Yes	No		Yes	No		
N = 144							
SCOFF 1 Make yourself sick (vomit) / Bulimia Nervosa	6 (5.2%)	110 (94.8%)	95.1% (0.95)	5 (17.9%)	23 (82.1%)	84.8% (0.85)	82.4% (0.82)
SCOFF 2 Lost control over eating / Binge Eating	53 (45.7%)	63 (54.3%)	68.6% (0.69)	22 (78.6%)	6 (21.4%)	56% (0.56)	34.6% (0.35)
SCOFF 3 Lost more than one stone(15 pounds/6.35kg)	18 (15.5%)	98 (84.5%)	86.6% (0.87)	4 (14.3%)	24 (85.7%)	87.5% (0.88)	60.9% (0.61)
SCOFF 4 Believe yourself to be fat	48 (41.4%)	68 (58.6%)	70.7% (0.71)	20 (71.4%)	8 (28.6%)	58.3% (0.58)	36.8% (0.37)
SCOFF 5 Food dominates your life	36 (31%)	80 (69%)	76.3% (0.76)	12 (42.9%)	16 (57.1%)	70% (0.7)	43.8% (0.44)
EAT A Binge eating	24 (20.7%)	92 (79.3%)	82.9% (0.83)	8 (28.6%)	20 (71.4%)	77.8% (0.78)	53.8% (0.54)
EAT B Make yourself sick (vomit) / Bulimia Nervosa	3 (2.6%)	113 (97.4%)	97.5% (0.97)	7 (25%)	21 (75%)	80% (0.8)	90.3% (0.90)
EAT C Laxatives, diet pills, diuretics	6 (5.2%)	110 (94.8%)	95.1% (0.95)	9 (32.1%)	19 (67.9%)	75.7% (0.76)	82.4% (0.82)
EAT D Treated for Eating Disorder previously	3 (2.6%)	112 (96.6%)	97.5% (0.97)	4 (14.3%)	24 (85.7%)	87.5% (0.88)	90.3% (0.90)

The responses to the TFEQ (N=145), indicating eating attitude, broken down into the subscales of dietary restraint, disinhibition of eating and perceived hunger is reported in (table 3).

Table 3: Prevalence of responses towards subscales of eating attitude according to the TFEQ.

TFEQ N = 145	1 st Year Dietetic Students n = 24		3 rd and 4 th Year Dietetic Students n = 38		1 st Year Non-Dietetic Students n = 83	
	Mean	SD	Mean	SD	Mean	SD
TFEQ - RESTRAINT	11.29	5.0	9.71	4.99	7.40	4.24
TFEQ - DISINHIBITION	7.17	3.03	6.60	3.72	7.01	2.71
TFEQ - HUNGER	6.04	3.50	6.60	3.20	7.24	2.99

which a diagnostic test measures those without the disease as having the disease. In the current study, a significant difference was measured in sensitivity, specificity, and positive predictive value of the different screening tools. The specificity of identifying the presence of an ED was higher for SCOFF 1 (making yourself vomit) (95.1%). However, the scores for EAT B (making yourself vomit) (97.5%) and EAT D (treated for an eating disorder) (97.5%), was slightly higher and followed by EAT C (using laxatives, diet pills and diuretics) (95.1%). In terms of sensitivity, SCOFF 3 (weight loss of more than 6.35kg) and EAT D (being treated for an eating disorder) was highest at 87.5%. The predictive positive value (PPV) was the highest for EAT B (making yourself vomit) (90.3%) and EAT D (previously treated for an eating disorder) (90.3%), followed by SCOFF 1 (making yourself vomit) (82.4%) and EAT C (using laxatives, diet pills and diuretics) (82.4%). A highly significant difference (p =

0.000) was found for having no ED compared to having an ED for SCOFF 2, EAT B and EAT C, while a significant difference (p < 0.05) was documented for SCOFF 1, SCOFF 4 and EAT D.

The responses to the TFEQ (N=145), indicating eating attitude, broken down into the subscales of dietary restraint, disinhibition of eating and perceived hunger is reported in (table 3).

DISCUSSION

Adenameloblastoma, also referred to as an Adenomatoid Odontogenic Tumor (AOT), is a rarely occurring benign tumor that predominantly affects When the responses to the SCOFF questionnaire was compared to first year non-dietetic students, first year dietetic students reported a higher prevalence for having lost control over eating, which can be indicative of binge eating and indicated that food dominated their lives. Binge eaters usually

suffer from high standards and expectations, and when they fall short of these standards which they perceive as demands of others, they are motivated by a desire or attitude to escape from self-awareness and self-regulation by adjusting their eating behaviour. When comparing the responses of the first year dietetic to the pooled sample of third and fourth year dietetic students for responses to the SCOFF questionnaire, the general trend was that there was a decrease in the prevalence of vomiting, losing control over eating, having lost more than 6.35kg and food dominating their lives. However, there was an increase, although not statistically significant, among older dietitians believing themselves to be fat. AN can mostly affect young women, but not exclusively, when restricting their kilojoule intake and also characterised by a distorted body image when excessive dieting can lead to severe weight loss²⁴. Findings generated by the EAT-26 questionnaire behavioural questions¹⁷, indicated that for the EAT A question, first year dietetic students had a lower prevalence of binge eating when compared to the pooled sample of more senior dietetic students, as well as first year non-dietetic students. This differed significantly when first year dietetic students were compared to their more senior counterparts, as well as when compared to first year non-dietetic students. Binge eating or BED is associated with an increased frequency of weight fluctuation, depression, perceived barriers to weight loss, anxiety, emotional distress and substance abuse in individuals and students [23-24]. Third and fourth year dietetic students also had a higher prevalence for the response of the EAT B (making yourself sick) question when compared to the other two groups. However, when it came to EAT C (using laxatives, pills and diuretics) and EAT D (having previously been treated for an eating disorder), first year dietetic students had the highest score. For EAT C, the difference between first years dietetic versus non-dietetic students was statistically significant. However, the differences between the groups were not statistically significant for EAT D. Sensitivity gives an indication of the ability of a diagnostic or screening test, such as the SCOFF- and EAT-26 questionnaire, to successfully diagnose an ED among female undergraduate students. In the current study, the SCOFF- and EAT-26 questionnaires were both used to identify the prevalence of EDs among female undergraduate

dietetic- and non-dietetic students. The sensitivity was higher in the SCOFF questionnaire for SCOFF 1 (84.8%) (To make yourself sick or having BN) and SCOFF 3 (87.5%) (To lose more than 6.35kg/one stone). For the behavioural questions of the EAT-26 questionnaire, the sensitivity of EAT B (80%) (To make yourself sick or having BN) and EAT D (87.5%) (Previously treated for an ED) was higher. Therefore, between the SCOFF- and EAT-26 questionnaires the sensitivity of the two questionnaires could be used to determine specific aspects of an ED. Table 4 provides a summary of the combination of questions, based on this study result that can be used as a shortened screening questionnaire to determine the presence of an ED, after the specificity and sensitivity was determined.

The prevalence was higher in first year non-dietetic students than dietetic students for SCOFF 1 (BN), SCOFF 2 (binge eating), SCOFF 3 (weight loss) and SCOFF 4 (feeling fat). While first year dietetic students had a higher indication over first year non-dietetic students for SCOFF 5 (food), EAT C (diet pills) and EAT D (treated for an ED). It was highest indicated in third- and fourth year dietetic students combined for EAT B (BN) and only slightly higher in first year dietetic students than first year non-dietetic students; and with EAT A (binge eating) when the prevalence of first year non-dietetic students was higher than first year dietetic students. While for eating attitude a significant difference was found for restraint, but no significant difference was found for disinhibition and perceived hunger for first-, third- or fourth year dietetic students compared to first year non-dietetic students, by using the TFEQ.

CONCLUSION

Although different selection procedures are being used at universities, it would be more helpful if a standardized screening tool could be used to select prospective dietetic students, to help determine if they suffer from an existing or pre-diagnosed ED. The usage of a shortened screening tool, like the 'ED questionnaire' developed to assist in the selection process of prospective students can be perceived as a measure to assure that those students that will eventually be selected for the degree, themselves have a healthy food intake and any disordered eating behavior be addressed. It

should be emphasised that the core task of the dietitian is to help others with their eating habits and thus firstly be able to assist themselves with their own diagnosed EDs. The SCOFF- and EAT-26 questionnaire behavioural questions can be combined as a screening tool to be more sensitive and specifically diagnosing EDs. The ED Questionnaire consists of only seven questions, as indicated. This shorter, compact version can also help to save time and used as a screening tool for both dietetic- and non-dietetic prospective and already enrolled students. This screening tool (ED Questionnaire) can assist to detect possible EDs in prospective students and from the results of this questionnaire answered, treatment and counselling can be given to these students before starting their studies at the irrespective universities in South Africa. The ED Questionnaire needs to be tested on a study sample of students at UKZN before it can be recommended and used at other tertiary institutes. It can also be translated into an app for use on other devices for future use to assist teachers, parents and students to detect the possibility of an ED. To be connected to resources available in a country, for the user to connect for assistance with qualified healthcare professionals, when someone is diagnosed with the possibility of an ED.

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