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A Systematic Review of Literature on School Screening for Eating Disorders

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Abstract

Many adolescents with eating disorders are not identified until life threatening physical complications becomes apparent. Research conclusively demonstrates that treatment success depends on early disease identification. Anorexia nervosa and bulimia nervosa in particular, pose grave risks to individuals, with the highest mortality rates of any mental illness. Onset of these types of eating disorders occurs between 10 and 20 years of age, making their detection in high schools, middle schools, and even in elementary schools important. Thus, this systematic review of literature was undertaken to find out if there is a validated and reliable tool that school nurses could use to effectively screen adolescents for eating disorders. This systematic review identified and evaluated several screening tools previously used to screen adolescents for eating disorders, as reported by research studies published between 1982 and 2015. Irrelevant studies were discarded based on outlined criteria. The STARD 25-point scale was used to assess the relevant studies for quality of the studies' results and the validity. In the end, the SCOFF questionnaire was identified as a valid and reliable tool the school nurse can utilize effectively to screen students for eating disorders.

Keywords: Eating disorder, screening tool, adolescents, school screening programs, school nursing

Background

Eating disorders are psychiatric disorders with serious and sometimes life threatening physical complications. The 5th edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5), lists diagnostic criteria for five types of eating disorders: anorexia nervosa, bulimia nervosa, binge eating disorder, avoidance/restrictive eating disorder, and pica (American Psychiatric Association, 2013). Anorexia and bulimia are particularly concerning as they have the highest rates of mortality, of all mental illnesses and are frequently associated with depression, severe anxiety and a high potential for suicide (Harrington *et al.*, 2015; National Institute of Mental Health, 2012).Although there is no immediate cure for eating disorders, recovery is possible through various forms of treatment.

Treatment success and recovery depend on disease identification. Early detection of an eating disorder is vital to preventing life threatening medical complications as well as increasing the individual's chance of recovery (Cook & Sawyer 2004; Smink*et al.*, 2013). Research has shown that the longer an eating disorder continues, the more difficult it is to treat, resulting in the extension of symptoms well into adulthood (Herpertz*et al.*, 2015; Neumark-Sztainer, *et al.*, 2011). The previous *Diagnostic and Statistical Manual of Mental Disorders* (DSM-4) included anorexia nervosa and bulimia nervosa; however, the specific criteria for the disorders in this version prevented early diagnosis. The DSM-5 revised the diagnostic criteria for anorexia and bulimia, making early diagnosis of these particular disorders possible (Smink*et al.*, 2013). A diagnosis of anorexia nervosa no longer requires BMI less than 17.5 and/or amenorrhea, as had been the physical criteria in the DSM-4. The diagnostic criteria for bulimia were also revised; the frequency of purging episodes needed to reach a diagnosis was decreased. The revisions open the possibility of diagnosis of eating disorders earlier than was possible with the DSM-4 criteria (Smink*et al.*, 2013). Current literature identifies the age of onset of eating disorders as between 10 and 20 years (Dooley-Hash *et al.*, 2012), indicating that eating disorders are present in high schools, middle schools, and even elementary schools.

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Two specific types of eating disorders, anorexia and bulimia, have been identified as the most common eating disorders among both males and females ages 14-20 years, with no specific trend in regards to income level or ethic group (Dooley-Hash *et al.,* 2012). Unfortunately, many adolescents with eating disorders are not identified until life-threatening physical complications become apparent.

School-based Screening

Because eating disorders are common in school children, it is important that schools implement routine screenings to identify students at risk. A screening test does not diagnose an eating disorder; rather, a screening test can identify individuals who may have a disorder but are not yet symptomatic or individuals who are at risk of developing an eating disorder (Kanchanaraksa, 2008). Unfortunately, there are no mandated screenings or national standards for eating disorder screening in public schools in the United States. The current health focus in schools is on the overweight child. Fourteen states, or 30% of the educational systems in the country, have mandated school-based programs for monitoring students' body mass index (BMI) (Hendershot *et al.*, 2008; National Association of State Boards of Education, n.d.).

Although measurement of body mass by a trained healthcare professional can be a useful method of screening, caution must be taken when implementing BMI measurement programs in schools for two reasons. In recent studies of BMI screenings of adolescents, researchers have identified a high association between obesity and bulimia in both males and females (Flament *et al.*, 2015; Zakhem *et al.*, 2015), but focusing solely on the elevated BMI of individuals may miss identifying students with eating disorders. Additionally, taking BMI measurements in school settings may trigger an anorexic response in students who are predisposed to developing an eating disorder (Ikeda *et al.*, 2006; Sim *et al.*, 2013).

Throughout the United States, required school health assessment and mandated screenings are regulated by state, regional or local school districts policies. Mandated screenings differ with each state. In California, school nurses are mandated by the state Departments of Education, Health Services, and Social Services to conduct health assessments of students enrolled in the public school system (Califorina Education Codes, n.d.). The California School Nurses Organization (CSNO, 2011) identified the credentialed school nurse as only school professionals, who are qualified by law to perform health assessments in the school setting. Thus, a credentialed school nurse is not a self-acclaimed health practitioner, but a certified professional.

The National Association of School Nurses (2013) believes school nurses are in a perfect position within the school setting to identify students with actual or potential eating disorders because of their contact with students and their practice of conducting health screenings. The American Academy of Pediatrics (2003) also supports the school nurse as the person who should conduct health screenings and provide health services to students throughout United States public school system. Despite the school nurse's professional expertise and authority, and the recommendations of these professional bodies, currently there are still no mandated screenings or national standards for eating disorder screening in public schools.

In 2000, The National Eating Disorders Screening Program (NEDSP) conducted a national screening exercise, which remains the only such program having been conducted in the United States. The study consisted of 51 high schools throughout the U. S., which screened adolescents for eating disorders utilizing the Eating Attitudes Test-26 (EAT-26) as the screening tool (Austin, 2011). The study demonstrated the importance of school-based screening programs for adolescents, observing that schools have access to a large population of individuals who do not always seek healthcare. The program afforded the school nurses of the ability to assess and refer students, ultimately increasing students' access to care.

Though the program was considered successful, there were some limitations identified. The researchers noted that the length of the EAT-26 screening questionnaire posed some implementation challenges; time constraints in administration of the lengthy tool made thorough completion difficult. The researchers recommended that evaluation of high school students include questions about preoccupation with food or with thinness, items not part of the EAT-26 screening questionnaire (Appendix A).

Assessing Screening Tools

Screening tools must be assessed for validity and reliability. An eating disorder screening tool is valid if it is able to identify individuals who may have an eating disorder; it is reliable if it is able to consistently identify those at risk with different individuals administering it (Bossuyt *et al.*, 2003; Kanchanaraksa, 2008). A screening questionnaire that is useful in school-based screenings must meet additional criteria. Routine health screenings performed by school nurses are typically administered during instructional time to large numbers of students at a time. The need to avoid as much student time out of the classroom as possible limits the amount of time the nurse has for assessments. This constraint necessitates that any new screening must be implemented quickly, during mandated screenings currently in place; thus the tool must be brief. An additional consideration is the demographic composition of adolescents in schools throughout the United States; the current school population contains a diversity of races and ethnicities (Center for Public Education, 2012). This diversity calls for a screening tool that is reliable for use with both male and female adolescents as well as with students from a variety of cultures. Thus, this systematic review of literature was undertaken to identify a validated and reliable screening tool that school nurses could use to effectively screen adolescents for eating disorders.

Methods

A systemic review of literature was conducted to identify a valid, reliable tool for screening adolescents for eating disorders in a school-based screening program. The Pub Med and Cochrane databases were searched for studies conducted between 2010 and 2015 on eating disorder screening questionnaires. Articles found from this search were further reviewed for their focus specifically on adolescents and screening for disordered eating. Thus, only articles that fulfilled the following eligibility criteria were considered for full text review: (1) the article was written in English. (2) The article was related to eating disorder screening tools. (3)The study was focused on adolescents or youths.

The articles that met the above criteria were selected for full text review. These studies examined and assessed screening tools utilized from 1982 to 2015. The studies were then grouped into various categories, based on the particular screening tool utilized in the study. The identified questionnaires, described briefly in Appendix B, were further evaluated for their ability to quickly screen for both anorexia and bulimia in the school setting. The criterion of "brevity" in a screening tool was based on less than 26 items, since previous research indicated the EAT-26 was too lengthy a questionnaire for the school setting (Austin, 2011).

One tool met the above criteria. Thus, a secondary literature search was conducted to identify research studies from 1999 to 2015 that used that particular screening tool with adolescents. For the secondary search, the inclusion criteria for full text review are as follows: (1) the article must be written in English. (2) The study must be focused on adolescents or youths. The studies that met the above criteria were identified and selected. The selected articles were reviewed using the Standards for Reporting of Diagnostic Accuracy (STARD) criteria for rating and reporting of the quality of a study.

Results

For the primary literature review a total of 480 titles were identified through database search, of which 100 duplicates were removed. All remaining 380 titles were screened and 200 articles were excluded as they did not meet the inclusion criteria. The full texts of the remaining 180 articles were assessed for eligibility. However, at this stage 165 articles were eventually excluded. In the end, 11 studies were included in the final review. The principal reason behind discarding the affected full texts was based on the validity and reliability of the screening tool used for such studies and their focus on to adults. Eleven screening tools focused on adolescent screening were identified at the beginning (Appendix B): the Binge Eating Scale (BES), Disordered Eating Attitude Scale (DEAS), the Eating Attitudes Test (Eat-26), Eating Disorders Inventory (EDI-1), Eating Disorder Exam questionnaire (EDE-Q), Emotional Eating Scale for Children (EES-C), the Ortho-15, the Revised Restraint Scale (RRS), the SCOFF questionnaire, the Social Attitudes Towards Appearance Scale, (SATA Scale), and the Yale Food Addition Scale (YFAS).

The following identified screening tools were dismissed from further review due to their focus of study and length of assessment. The BES was eliminated due to its restriction to binge eating disorders; the EES-C and YFAS were dismissed for their focus on addictive eating in children; the Ortho-15 was disregarded for its emphasis on eating only pure, organic foods; the RRS was eliminated because of its focus on restrictive dietary practices.

The six remaining screening questionnaires, the DEAS, SATA Scale, EAT-26, EDE-Q, EDI-2 and the SCOFF, were further examined for their brevity and reliably. The DEAS, SATA Scale, EDI-2, EDE-Q, and the Eat-26, were dismissed due to their lengths: 37, 40, 41, 91, and 26 items, respectively. The SCOFF questionnaire remained, having met the outlined criteria.

The secondary literature search focus was specifically regarding the SCOFF instrument. Initially, 68 titles were identified after removing duplicates. The abstracts of these articles were then screened for eligibility, but 48 studies were discarded here as they were not focused on adolescents. The full texts of the 20 remaining research studies were examined for eligibility. At this point, nine articles were discarded, as they were published in either German or Spanish. The remaining 11 studies were then subjected to qualitative synthesis and evaluated using the STARD 25-point scale to assess the quality of the studies' results and the validity of the studies.

Of the assessed studies, one study scored 23/25 on the STARD. This research, conducted in Barcelona, Spain, examined adolescents between the ages of 10.9 and 17.3 years. The evaluation of this study indicated the SCOFF questionnaire was a brief and useful screening tool for detecting adolescents at risk for eating disorders (Muro-Sans *et al.*, 2008).

Discussion

The SCOFF questionnaire was developed in 1999 by researchers at Saint George Medical Hospital in London (Luck *et al.*, 2002). It consists of five yes or no questions; two or more affirmative answers indicate a risk for anorexia or bulimia (Appendix C). The validity and reliability of the SCOFF questionnaire offers a real tide-turning opportunity for the identification of adolescents that are in danger of eating disorders. This tool has been utilized in over 10 countries (Appendix D), thus establishing its reliability. The major strength of this screening tool is in its brevity (Mond*et al.*, 2008), which means the students can fill it without being unnecessarily burdened

The brevity of the SCOFF instrument can really help the school nurse in effectively diagnosing eating disorders in students. This is so, because most schools try as much as possible to limit out-of-classroom activities during school hours, which means activities such as administration of questionnaires, will be preferred during break periods, which is usually very short. In essence, the brevity of the tool will help the school nurse in reaching a wider range of respondents and get more honest answers, since the respondents won't feel the urge to rush through it.

The brief questionnaire can be administered as part of current mandated school health screenings and could be very effective in identifying students at risk of developing a life threatening eating disorder. Additionally, the implementation of a school-based screening program capable of identifying these individuals prior to diagnosis and before physical complications arise could help to prevent chronic health concerns, and thereby could reduce the overall consequent burden faced by the school nurse.

Conclusion

Studies have conclusively identified anorexia and bulimia to have the highest mortality rate of any mental illness. Research has also identified these particular eating disorders occur in individuals as young as age 10. The SCOFF Questionnaire has been proven to be a viable and reliable screening tool for detecting the presence of anorexia and/or bulimia in adolescents, thereby, minimizing the effects of these illnesses on their performance in school.

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Appendix A: EAT-26 Questionnaire

Eating Attitudes Test (EAT-26)©

Instructions: This is a screening measure to help you determine whether you might have an eating disorder that needs professional attention. This screening measure is not designed to make a diagnosis of an eating disorder or take the place of a professional consultation. Please fill out the below form as accurately, honestly and completely as possible. There are no right or wrong answers. All of your responses are confidential.

Part A: Complete the following questions:

1) Birth Date Month: Day: Year: 2) Gender: Male Female

3) Height Feet : Inches: ☐ ☐

4) Current Weight (lbs.): 5) Highest Weight (excluding pregnancy):

6) Lowest Adult Weight: 7: Ideal Weight:

	Part B: Check a response for each of the following statements:	Always	Usually	Often	Some times	Rarely	Never
1.	Am terrified about being overweight.	☐	☐	☐	☐	☐	☐
2.	Avoid eatng when I am hungry.	☐	☐	☐	☐	☐	☐
3.	Find myself preoccupied with food.	☐	☐	☐	☐	☐	☐
4.	Have gone on eating binges where I feel that I may not be able to stop.	☐	☐	☐	☐	☐	☐
5.	Cut my food into small pieces.	☐	☐	☐	☐	☐	☐
6.	Aware of the calorie content of foods that I eat.	☐	☐	☐	☐	☐	☐
7.	Particulary avoid food with a high carbohydrate content (i.e. bread, rice, potatoes, etc.)	☐	☐	☐	☐	☐	☐
8.	Feel that others would prefer if I ate more.	☐	☐	☐	☐	☐	☐
9.	Vomit after I have eaten.	☐	☐	☐	☐	☐	☐
10.	Feel extremely guilty after eating.	☐	☐	☐	☐	☐	☐
11.	Am preoccupied with a desire to be thinner.	☐	☐	☐	☐	☐	☐
12.	Think about burning up calories when I exercise.	☐	☐	☐	☐	☐	☐
13.	Other people think that I am too thin.	☐	☐	☐	☐	☐	☐
14.	Am preoccupied with the thought of having fat on my body.	☐	☐	☐	☐	☐	☐
15.	Take longer than others to eat my meals.	☐	☐	☐	☐	☐	☐
16.	Avoid foods with sugar in them.	☐	☐	☐	☐	☐	☐
17.	Eat diet foods.	☐	☐	☐	☐	☐	☐
18.	Feel that food controls my life.	☐	☐	☐	☐	☐	☐
19.	Display self-control around food.	☐	☐	☐	☐	☐	☐
20.	Feel that others pressure me to eat.	☐	☐	☐	☐	☐	☐
21.	Give too much time and thought to food.	☐	☐	☐	☐	☐	☐
22.	Feel uncomfortable after eating sweets.	☐	☐	☐	☐	☐	☐
23.	Engage in dieting behavior.	☐	☐	☐	☐	☐	☐
24.	Like my stomach to be empty.	☐	☐	☐	☐	☐	☐
25.	Have the impulse to vomit after meals.	☐	☐	☐	☐	☐	☐
26.	Enjoy trying new rich foods.	☐	☐	☐	☐	☐	☐

	Part C: Behavioral Questions: In the past 6 months have you:	Never	Once a month or less	2-3 times a month	Once a week	2-6 times a week	Once a day or more
A	Gone on eating binges where you feel that you may not be able to stop? *	☐	☐	☐	☐	☐	☐
B	Ever made yourself sick (vomited) to control your weight or shape?	☐	☐	☐	☐	☐	☐
C	Ever used laxatives, diet pills or diuretics (water pills) to control your weight or shape?	☐	☐	☐	☐	☐	☐
D	Exercised more than 60 minutes a day to lose or to control your weight?	☐	☐	☐	☐	☐	☐
E	Lost 20 pounds or more in the past 6 months	Yes ☐		No ☐			

* Defined as eating much more than most people would under the same circumstances and feeling that eating is out of control

© Copyright: EAT-26: (Garner et al. 1982, *Psychological Medicine*, *12*, 871-878); adapted by D. Garner with permission.

Appendix B: Identified Questionnaires

Name of Screening Questionnaire	Acronym	Year created	Original Author(s)	No. of Items	Type of Screenir
Binge Eating Scale	BES	1982	Gormally	16	Binge Eating
Disordered Eating Attitude Scale	DEAS	2010	Alvarenga, Scagliusi, & Philippi	25	Attitudes toward Restrictive, purg
Eating Attitudes Test	EAT-26	1982	Garner, Olmsted, Bohr & Garfinkel	26	Eating Disorder Anorexia, Bulim Binging
Eating Disorder Exam Questionnaire	EDE-Q	1994	Fairburn & Beglin	28	Nonspecific Scre for eating Disord
Eating Disorders Inventory- 2	EDI-2	1991	Garner	94	Anorexia, Bulim Binge Eating disorder
Emotion Eating Scale-Children	EES-C	2007	Tanofsky-Kraff, et, al.	26	Emotional Eatin
Ortho-15	Ortho-15	2005	Donini, Marsili, Graziani, Imbriale & Cannella	15	Fixation on Heal Foods
Revised Restraint Scale	RRS	1980	Herman & Polivy	10	Restrictive Eatin Dieting
SCOFF Questionnaire	SCOFF	1999	Morgan, Reid & Lacey	5	Anorexia & Buli
Social Attitudes Towards Appearance Scale	SATA Scale	2000	Thompson, et, al.	38	Attitudes Towar Appearance
Yale Food Addition Scale	YFAS	2009	Gearhardt, Corbin & Brownell	25	Food Addiction

Appendix C: SCOFF Questionnaire

•Do you make yourself sick because you feel uncomfortably full?
•Do you worry you have lost control over how much you eat?
•Have you recently lost more than 14 pounds (one stone) in a three month period?
•Do you believe you are fat, when others say you are thin?
•Would you say food dominates your life?
Two or more affermative answers indicates a risk of Anorexia or Buliemia.

Appendix D: Countries where the SCOFF questionnaire has been used.

Primary Author	Ages	Gender	Country	Year Published	STARD Score
Hautala, Lea	15-17	Both	Finland	2008	24
Herpertz-Dahlman, Beate	11-17	Both	Germany	2008	20
Kurth, Barbel-Maria	0-17	Both	Germany	2008	15
			Comp Health		
Muro-Sans, Pilar	10.9-17.3	Both	Spain	2008	23
Herpertz-Dahlman, Beate	17-Nov	Both	Germany	2008	20
Hautala, Lea	14-16	Both	Finland	2009	23
Hague, Anne L.	UNK	Female	USA	2010	5
Sim, Leslie A.	Adolescents	Both	USA	2010	9
			Lit Review		
Hautala, Lea	14.9	Both	Finland	2011	23
Giel, Katrin E.	13+/-1.4	Female	Not Ident	2013	18
Hicks,Travis M.	Adolescents	Female	USA	2013	18
Jugale, PallaviVasantro	20-25	Female	India	2014	15
Herpertz-Dahlman, Beate	11-17	Both	Germany	2015	20
Watson, Hunna J.	12-17	N/S	China	2015	24