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Development and Validation of Disordered Eating Behavior Scale: Identification, Prevalence, and Difference with Clinically Diagnosed Eating Disorders

Amina Muazzam
Lahore College for Women University

Ruhi Khalid
Beaconhouse National University

In the present study, Disordered Eating Behavior Scale was developed and validated. The items were empirically generated. Factorial validity of the scale was determined on 250 participants. Factor analysis resulted in four factors i.e., Social Pressure for Eating, Eating Choices and Habits, Eating Withdrawal, and Overeating, which yielded an overall satisfactory Cronbach alpha (.86). Convergent validity was estimated by correlating the scores of Eating Attitude Test-26 (Garner, Olmsted, Bohr, & Garfinkel, 1982) with Disordered Eating Behavior Scale (N = 100). The resulting correlation was significant and added to the validity of Disordered Eating Behavior Scale. Discriminant validity was assessed by correlating the scores of Rosenberg Self-esteem Scale (Rosenberg, 1965) with Disordered Eating Behavior Scale (N = 140). The results showed significant inverse relationship between both measures. Concurrent validity was estimated by using method of contrasted groups and the results highlighted significant differences between the scores of control group and patients of eating disorders on Disordered Eating Behavior Scale. Since, disordered eating behavior fulfills all the psychometric requirements of scale, hence; it is a reliable and valid measure for assessing disordered eating behaviors in indigenous context.

Keywords: disordered eating, eating disorders, validity, Disordered Eating Behavior Scale

Over a period of two decades, numerous researchers have proposed disordered eating behavior as a continuum with unrestrained

Amina Muazzam, Department of Applied Psychology, Lahore College for Women University, Lahore, Pakistan.

Ruhi Khalid, Institute of Psychology, Beaconhouse National University, Lahore, Pakistan.

Correspondence concerning this article should be addressed to Amina Muazzam, Department of Applied Psychology, Lahore College for Women University, Lahore, Pakistan. E-mail: amina_muazzam@hotmail.com

eating on one end and clinically diagnosed eating disorders on other (Mintz, O'Halloran, Mulholland, & Schneider, 1997; Nylander, 1971). Several studies strongly suggest the continuum of eating disorder as a valid phenomenon (Collins, 2010; Levine & Smolak, 2006; Peck & Lightsey, 2008). Pereira and Alvarenga (2007) have explained that when disordered eating behaviors are culturally accepted and performed with significant frequency by a variety of groups, it can lead to the perception that these behaviors are normal, which can be detrimental to the prevention and treatment. To fully understand the continuum model of disordered eating behavior, it is essential to understand the construct of normal eating. According to Beumont, O'Connor, Lennerts, and Touyz (1990), normal eating includes the ingestion of healthy foods, the intake of a mixed and balanced diet that contains enough nutrients and calories to meet the body's needs and a positive attitude about food (no labeling of foods as good or bad, healthy or fattening which can lead to feelings of guilt and anxiety). Nevertheless, the difference in eating practices is largely dependent upon one's own culture.

Across the world disordered eating behavior is found in many, almost all the countries (American Psychiatric Association; APA, 2006). Although there are numerous assessment tools for eating disorders i.e., Eating Attitude Test (Garner & Garfinkel, 1979), Eating Disorder Inventory-2 (Garner, 1991), Assessment of Eating Disorders (Fairburn & Beglin, 1994), The Yale-Brown-Cornell Eating Disorder Scale (Sunday, Halmi, & Einhorn, 1995), Improved Detection of Eating Problems in Women with Type I Diabetes using a newly developed survey (Antisdel, Laffel, & Anderson, 2001), Project Eating Attitude Test (Neumark-Sztainer et al., 2002), and American Psychological Association (2000) consider these tools as a general guideline but individuals suffering from disordered eating must receive separate attention.

Highlighting the separate identity of this phenomenon, the Department of Health and Human Services and United States Department of Agriculture (2004) explained that disordered eating refers to troublesome eating behaviors, such as restrictive dieting, bingeing, or purging, which occur less frequently or are less severe than those required to meet the full criteria for the diagnosis of an eating disorder. The term disordered eating emerged in medical and psychological literature in the late 1970s, coinciding with the introduction of diagnostic criteria for bulimia nervosa (Russell, 1979). Disordered eating was initially described as diet disorder and imbalance of emotional state, after getting recovered from the state of anorexia (Palmer, 1979). Some of the earlier work explains this

phenomenon as bingeing, highly restrictive dieting, emotional eating, or purging (Kagan & Squires, 1984). Very frequently, it was generalized to explain young girls, who "diet at some time and lose more than 3 kg in weight; may experience episodes of binge eating and picking behavior; wish to be thinner irrespective of their current body weight and abuse laxatives or diuretics in order to achieve a fashionably slim figure" (Abraham, Mira, Beumont, Sowerbutts, & Lewellyn-Jones, 1983, p. 225).

Disordered eating consists of the continuum of unhealthy eating from dietary restraint to clinical eating disorders. All eating disorders are included in disordered eating but not all disordered eating meets the criteria for an eating disorder. Though there is no fine line to explain this term yet, it is generally used to describe disordered eating behaviors that are less severe as compared to eating disorders which are classified in DSM-IV-TR and ICD-10. Conversely, disordered eating is hardly warranting enough for medical attention besides being very common among young individuals.

The focus on disordered eating is important as there are many individuals who present with the disordered eating behaviors without meeting the full criteria of DSM-IV TR associated with eating disorders (i.e. anorexia nervosa and bulimia nervosa). These behaviors often result in outcomes that are harmful to both physical and mental health, and can easily develop into a clinical disorder if preventative measures are not implemented (Russell, 1979). Disordered eating can also be conceptualized as a wide spectrum of harmful and often ineffective eating behaviors used in attempts to lose weight or achieve a lean appearance (American College of Sports Medicine, 1997). However these harmful and ineffective behaviors vary drastically across cultures. Among the general population a very small number of people are considered to have full blown eating disorder as compared to disordered eating behaviors. A cultural preoccupation with food and the concurrent acceptance of a thin ideal as the cultural norm, has led to the development of a new set of eating behaviors, commonly referred to as disordered eating. Individuals who present disordered eating behaviors are considered to have sub-clinical eating disorders whereas some of these behaviors are described as Eating Disorders Not Otherwise Specified in the DSM-IV-TR. In addition, individuals with disordered eating do not present all of the psychological characteristics associated with clinical eating disorders (Fairburn & Garner, 1986).

Accordingly, the incidence and prevalence of disordered eating behaviors are more frequent than full blown eating disorders. It has been identified that 45-50% of college students manifest some sort of

disordered eating behavior (Muazzam & Khalid, 2008), whereas, this percentage is 64-68% for American college women (Hesse-Biber, 1989; Mintz & Betz, 1988). Furthermore, it has been postulated that the current social acceptance of the chronic dieter has led even normal eating behaviors to consist of disordered aspects. For example, in an article which focuses on preventative measures for disordered eating, Kalodner and Scarano (1992) included a specific section on interventions for normal eaters, briefing that, "It seems as though normal eating with its emphasis on weight control, may actually be quite abnormal" (p. 35).

There is a dearth of research work on disordered eating behaviors consistent with the above mentioned definition i.e., very few studies have been conducted in this area using Pakistani youth as a sample. Moreover, a limited group has been exposed to these researches, which confines the generalizability of results. For example, Mumford, Choudhry, and Whitehouse (2002) included only school girls from private sector, excluding boys in their study, on eating disorders. In contrast, the present scale development study included both male and female participants from a variety of public and private educational institutes.

The most vulnerable group is late adolescents in Pakistan (Suhail & Nisa, 2002). It is probably due to increased social pressure to maintain an ideal/slim figure which consequently decreases the self-esteem of an individual. In recent years, lot of research has been conducted on the emergence of disordered eating which is an effort to determine specific causal factors associated with this behavior (Alex, 1996; Harris & Greco, 1990; Hausenblas, 1998; Shelby, 2000; Smolak, Murnen, & Ruble, 2000; Sundgot-Borgen, 1994; Thompson & Sherman, 1999; Warren, Stanton, & Blessing, 1990; Wilkins, 1995; Wilkins, Boland, & Albinson, 1991). As far as the Pakistani cultural values regarding eating behaviors are concerned, this area has rarely been studied. There is variation in eating practices in indeginous culture. Food is an integral part, especially at celebrations like a wedding etc; a heavy sum of money is spent on food. Also, people usually spend time with their friends and family and enjoy eating together.

In Asian cultures, the ideal woman's figure has become increasingly thin due to unattainable norms promoted by the media and this leads toward the development of body image dissatisfaction. A number of women who choose to use disordered eating behaviors, probably accept these conflicting norms with the prevalence of cultural obsession with food which has increased greatly (Lucas,

Crowson, O'Fallon, & Melton, 1999). Attaining the thin ideal is often a lifelong pursuit and the eating behaviors (such as dieting), in which many women engage becomes socially accepted as normal eating (Kalodner & Scarano, 1992).

Self-esteem has been one of the most familiar factors that have been investigated in relation to disordered eating (Cervera et al., 2003; Croll, Neumark-Sztainer, Story, & Ireland, 2002; Gual et al., 2002). Low self-esteem has been shown to have a negative effect on dieting and bingeing behaviors in adolescent girls (Lindeman, 1994). Friestad and Rise (2004) also found that self-esteem was a predictor for dieting in both genders. However, most of the studies conducted in this area focused more on women than men (Tylka & Subich, 2002). The reason behind is that the scales developed to diagnose disordered eating behaviors are geared towards women. An item from the Eating Disorders Inventory-2 (Garner, 1991) illustrates this phenomenon: "I think that my thighs are too large". While women are usually dissatisfied with their bodies because they think they are too large, men have the opposite thought processes. Men often strive for a muscular or larger physical ideal (Muazzam & Khalid, 2008).

Further, investigation into disordered eating in men is clearly contingent upon the development of more appropriate instruments. So for identifying the disordered eating behaviors in Pakistani youth, a scale was developed to have a better identification of this phenomenon in Pakistani culture.

Disordered eating is influenced by both psychological and socio-cultural factors. So, a disordered eating behavior scale should be based on local experiences, and reflect local language. As evident from relevant research and discussed above, different scales have been developed for assessment of disordered eating behaviors. Researchers have focused on behavioral domains like dieting, hunger, food preoccupation, emotional and cognitive eating (Garner & Grafinkel, 1979).

In existing line of research social and cultural pressures for eating were entirely neglected, thus, there is dire need to develop an indigenous scale for assessment of disordered eating behaviors in Pakistani youth. This scale attempts to capture the entire breadth of behaviors manifested by Pakistani youth in different life domains. The current research, thus aims to explore the construct of eating behavior and develop an indigenous instrument. More importantly, the scale will enable us to understand the unique behaviors that depict the disordered eating practices in Pakistani youth.

Method

Considering the purpose of the current research, to develop Disordered Eating Behavior Scale (DEBS), this study was conducted in three phases.

Phase I: Identifying Phenomenology of Disordered Eating Behavior

To generate items following steps were followed:

Step 1. The items were generated using inductive as well as and deductive approach and therefore, the researcher reviewed relevant literature on disordered eating behavior and conducted unstructured interviews. Items were derived from three sources which are:

Literature review. The review of local and foreign literature was thoroughly done to study the phenomenology of eating. Review of literature also included already existing scales and studies on disordered eating.

Unstructured interview with individuals. Purposive sampling was used for selecting 30 students (15 from each gender) from a public educational institute. Age range of participants was 16-24 years (M = 20.5, SD = 2.2). Unstructured interview was conducted with each individual in order to identify his or her eating patterns. Each interview was audio-taped and the recordings were transcribed and analyzed. Interviews consisted of a series of open-ended questions related to disordered eating such as: *Mera khanay ka janoon*….[My obsession with food….]; *main perhaiz kerta hoon khanay say*…[I avoid eating ….]; *zayada ter waqat main khata hoon*…..[most often I eat…]. Participants were allowed to provide detailed answers to each question. Participants were probed and encouraged to talk about their disturbances in eating patterns that they were facing or consider to be disordered. Although, the interviews were unstructured, the researcher had relevant queries related to disorder eating behaviors and focused on these e.g., the nature and experience of disordered eating and how it is linked with one's daily life.

Interview with practicing psychologists. Moreover, five practicing psychologists (with almost 15 years of clinical experience each) were interviewed for the item generation of DEBS. They were asked to report the symptoms they observed in patients suffering from disordered eating behaviors, during their clinical practice. The

intensity and frequency of such behaviors were emphasized to focus. Fifty six symptoms obtained more than 50% endorsement from the psychologists, hence retained for the scale. As the focus of the present study is on disordered eating, therefore, it was necessary to consciously separate the items of disordered eating behavior from items of occasional disruption in eating patterns, while developing the DEBS.

Finally, 56 disordered eating behaviors obtained from all three sources were pooled together in the form of a list of items for initial administration. Some of the items were as follows: *Khali pat rehna* [Being empty stomach]; *khanay kay do muqarara auqat kay darmyan khatay rehna* [eating between meals]; *phaloon per methai koo tarjeh dena* [preference of sweets over fruits]; *us khurak ko chuba ker phank dena jo khaye ja saktee hoo* [to spit the eatable food after chewing].

Step II. In order to retain the most appropriate items for disordered eating behaviors scale, the items obtained in the previous step, were checked for frequency, on a three point response format, ranging from 0 for *rarely* to 2 for *frequently*. These items were administered to same 30 participants, with whom unstructured interviews were conducted (asking them to report on the items relevant to disordered eating behavior that they experience in their daily life). The most frequently occurring behaviors (with the criteria of having received an endorsement of 20% and above) were retained. These items were closely scrutinized for their content as well. From these items thus obtained, 20 overlapping and normal eating behaviors were eliminated and thus thirty six items were retained out of fifty six at this step.

Step III. The content of the items was reviewed very closely again by the practicing psychologists. Each of the five psychologists independently evaluated each item for (a) fidelity to the relevant construct, (b) clarity, (c) comprehensibility/readability, and (d) redundancy. Five items were deleted out of 36 on the basis of psychologists' evaluation for being redundant or unclear. This exercise resulted in 31 items. The chosen items were checked for their wording and only one was rephrased, before presenting them in the final form of scale for the study.

Step IV. The 31 items were presented in the form of a 5-point likert-type scale, which required the participants of the study to report the degree of their agreement or disagreement with each item. Response format ranged from *always* (4) to *never* (0). Instructions

were "Following are some statements regarding our daily eating habits. Read them carefully and tick the option which is more appropriate for you". Some of the items were as follows: *main shadeed bhook kay bawajood khanay say ahtraz kerta hoon* [I avoid food in spite of severe hunger]; *meray khanay kay auqat muqarer nahee* [I follow no time schedule for eating]; *main har mehmaan kay sath chayay ya sherbet zaroor peeta hoon* [I compulsory take tea/drink with every guest]; *meray dost mujhay baywja khanay per majboor kertay hain* [My friend's undue force me to eat]. These statements were developed to tap the eating choice and habits and social pressures for eating in Pakistani youth.

Step V. The items were pilot tested for any ambiguity and lack of clarity on 30 participants with age range 16-24 years (M = 19.8, SD = 2.1) from a public educational institute. Participants were instructed to fill the questionnaire and to note any ambiguous statement. All the 31 items were reported to be clear and comprehendible, and were retained for the final version of the scale.

Phase II: Establishing the Construct validity through Factor Analysis

One of the purposes of factor analysis is to assess the construct validity of a test or a number of tests (Kahn, 2006).

Sample. The sample consisted of 250 participants (132 men and 118 women) from both public and private educational institutes. Their ages ranged from 16-24 years (M = 19.17, SD = 1.47). The size of the sample was selected in accordance with the notion that in factor analysis there should be at least 200 participants in respect of statistical error. Moreover, the number of participants was estimated so that the ratio of number of participants to the number of items was around seven, which is considered satisfactory for factor analysis (Gorsuch, 1983). Since the scale comprised 31 items, therefore, sample of 217 appeared appropriate which was finally considered to be 250. The demographic information of participants is summarized in Table1.

Table1
Demographic Characteristics of the Sample (N = 250)

Variables	*n*	%
Gender		
Men	132	52
Women	118	48

Cont…

Variables	*n*	%
Education		
First Year	60	23
Second Year	62	24
Third Year	65	27
Fourth Year	63	26
Institutes		
Public	120	49
Private	130	51

Procedure. Disordered Eating Behavior Scale (DEBS) was administered in group setting. The participants were instructed to select a response to each item which best described them. They were assured of the confidentiality of their responses and informed that the data would only be used for research purpose. All data were collected anonymously; no names were asked. In order to assess the factorial validity, a principal component analysis was carried out on the responses of 250 participants. The psychometric properties of the scale were also determined.

Results of Factor Analysis. The construct validity of DEBS was studied by means of principal component analysis (PCA) using varimax rotation. The purpose of the varimax rotation was to maximize the interpretability of the factors (Kahn, 2006). The condition of the distribution of participants' responses was evaluated through Bartlett's test of sphericity (Bartlett, 1954). Bartlett's test of sphericity was significant ($p < .001$), indicating that the data was adequately distributed to allow an evaluation of the potential factor structure. Next, the Kaiser-Meyer-Olkin measure of sampling adequacy was calculated (Kaiser, 1974) which yielded a value of .80, indicating that the ratio of the number of participants to DEBS items was sufficient to run a principal-component factor analysis.

The number of meaningful components or factors was also determined by the Kaiser criterion, and the total explained variance. Kaiser-Guttman's retention criterion of Eigen values greater than 1 (Kaiser, 1974) resulted in nine factors, but this showed over-extraction. Therefore, subsequent principal component analyses were performed using eight, seven, six, five, and four factor solutions using varimax rotation. The four factor solution most closely corresponded to the best approximation of simple structure with the fewest number of cross-loadings and it yielded the most interpretable solution. Moreover, the scree test for Eigen values plot was used (Cattell, 1966; Nunnally,

1978). Eigen values were 6.29, 5.97, 3.20, and 2.06 for factor 1, 2, 3, and 4, respectively. A four factor model was examined in detail and accepted with 56% of the total variance.

Items for the scale were selected on the criteria of having factor loadings of .45 and beyond (Raubenheimer, 2004). Five items (i.e., items no. 5, 17, 18, 19, 30), having factor loadings less than .45 were eliminated from the scale. All the remaining 26 items had high factor loadings (ranging from .47 to .94) on the four factors; resultant was multidimensional 26-item DEBS. The extracted four factors were then presented to subject matter experts (SME; Department of Applied Psychology, University of the Punjab, having 20 years of valuable teaching experience of the subject) for giving each factor an appropriate name. Both the researcher and the SME gone through the content of each factor carefully and concluded that items describing need for social approval, fear of rejection, communication regarding appearance, and peer group influence on one's eating were named as Social Pressures. The items manifesting different habits and choices such as skipping meals, eating between meals, chewing and spitting were named as Eating Choices and Habits. Eating Withdrawal was given name to third factor as there was a pool of items describing weight loss, feelings of discomfort with food, eating distress, and intense dieting. The last factor was named "Overeating" because most of the items in this factor were related to eating more than usual in celebrations and mourning and with peer group as well as guests. The labeled factors with respective factor loading are presented in Table 2.

Table 2

Factor Loadings of the 26 Items of DEBS on Four Factors Solution (N = 250)

S. No.	No. of Items	Social Pressures	Eating Choices & Habits	Eating Withdrawal	Overeating
1	22	**.955**	.219	-.022	.024
2	20	**.937**	.189	.000	-.031
3	28	**.932**	.125	.00	.052
4	31	**.905**	.032	.05	.061
5	21	**.856**	.161	.013	.032
6	23	**.605**	.447	.000	.000
7	24	.162	**.955**	-.030	-.000

Cont…

S. No.	No. of Items	Social Pressures	Eating Choices & Habits	Eating Withdrawal	Overeating
8	29	.143	**.927**	-.008	.020
9	27	.133	**.918**	.011	.000
10	26	.045	**.881**	-.015	.000
11	25	.157	**.829**	-.053	.041
12	2	.043	-.00	**.734**	.053
13	1	.063	.094	**.697**	.172
14	11	.010	.013	**.686**	.198
15	3	-.007	.043	**.675**	.132
16	13	-.044	.132	**.673**	-.000
17	7	-.000	.011	**.672**	.160
18	14	-.022	.034	**.670**	.223
19	10	-.093	.054	**.573**	.166
20	9	.030	-.000	.449	**.781**
21	16	-.044	.012	.141	**.777**
22	8	.000	.023	.361	**.772**
23	15	.056	.000	.178	**.724**
24	4	-.033	.012	.160	**.712**
25	12	-.012	.000	.224	**.686**
26	6	.065	.014	.311	**.497**
Eigenvalues		6.13	5.85	3.04	1.96
Variance		23.59	22.53	11.72	7.57
Cumulative Percentage		23.59	46.13	57.85	65.42

Note. The items having factor loadings of .45 and greater are given in boldface.

Final Structure of DEBS

Finally, Disordered Eating Behavior Scale (DEBS) with 26-item self report measure of indigenous disordered eating patterns and behaviors was established. The scale measures individual differences in disordered eating behaviors (M = 43.3; SD = 11.9). Respondents use a 5-point scale, on which 0 represents *never* and 4 represents *always* to indicate the extent to which each item described them. The

DEBS is intended for use with adolescents and general adult male and female population.

The higher the score, the more an individual is prone towards disordered eating behaviors. There are four subscales of DEBS i.e. (a) Social Pressure, (b) Eating Choices & Habits, (c) Eating Withdrawal, and (d) Overeating. The alpha coefficient of .86 was obtained for the DEBS. The alphas for subscales are .94, .95, .84, and .83 for Social Pressure for Eating, Eating Choices and Habits, Eating Withdrawal, and Overeating; respectively.

Reliability. Internal consistency was estimated by using Cronbach Alpha Coefficient. The 26 items of the scale were analyzed for the item total correlations. Item total correlations ranged from .31 to .68 and were medium to high ($p < .01$). Alpha internal consistency reliability estimate of the DEBS was considerably high i.e., .86 indicating that the degree of homogeneity among the items is consistent with the degree of homogeneity theoretically expected for the construct of disordered eating behavior. The internal consistency of the four subscales was evaluated by computing Cronbach alpha for each subscale. The alphas were high for all the four sub-scales.

Phase III. Psychometric Properties of DEBS

Construct Validity through Method of Contrasted Groups. Theoretical or construct validation procedures examine if the data measured really correspond to the theory of the authors. These procedures started with the work of Cronbach and Meehl (1955), who suggested the method of contrasted groups as a source of construct validity. During the contrasted group's method, the global results of the test applied to different groups are examined. One might hypothesize different results from these groups, so the method of contrasted groups was used for the construct validity of the scale.

***Sample*.** Thirty three diagnosed patients (i.e., individual's clinically diagnosed as having eating disorder by clinician on DSM IV-TR Criteria) with age range14-34 years (M = 20.4, SD = 3.8) and 33 normal individuals (control group) were included in the study. A control group was defined as the group of participants having no medical or psychiatric history of illness. The participants of control group were approached in educational institute. The age range of control group was 17- 28 years (M = 20.8, SD = 2.4.) which was

decided by keeping in view the mean age of eating disorders patients, in the present study. This was done to ensure that the scores of control group on DEBS might not get affected by any medical or psychological ailment.

Instrument. DEBS was administered on participants, selected for construct validity check. The questionnaire was completed anonymously, and the participation in the study was voluntary.

Procedure. Diagnosed patients were recruited through psychiatry wards of government and private hospitals. Only those patients were included who were diagnosed by the psychiatrist as having eating disorders. This tedious process took 14 months to collect the data as small number of patients were identified as having eating disorders. Six of them were referred from gestrointantology and dental department which shows that people are not well aware of this phenomenon. Control group was taken from a public educational institute.

Results. To test the assumption that there will be significant differences between control group and patients of eating disorders on DEBS, independent sample *t*-test was computed. There was a significant difference for scores of DEBS, $t(64) = 4.64$, $p < .001$, with eating disorders patients ($M = 59.87$, $SD = 12.75$) receiving higher scores than control group ($M = 45.45$, $SD = 12.49$) on DEBS. Hence, construct validity of the scale is established by method of contrasted groups.

Convergent Validity. Campbell and Fiske (1959) explained that the convergent validity coefficients are the correlations between measures of the same trait that are obtained with different measurement methods. For this reason, those correlations are at times referred to as monotrait-heteromethod (MTHM) coefficients. Since they reflect the (linear) relationships between indicators of the same trait, a finding of them being consistently high lends support for construct validity with regard to that trait.

Sample. Forty seven male and 53 female ($N = 100$) participants with ages ranging from 16-24 years ($M = 20.5$, $SD = 2.2$) participated in the present study. The participants belonged to different public and private educational institutes.

Instrument. The Eating Attitude Test -26 (Garner et al., 1982) and DEBS were used to establish the convergent validity. EAT-26 is a 26 item test questionnaire designed to identify abnormal eating habits and concerns about weight derived from a 40 item original inventory (Garner & Garfinkel 1979). The EAT-26 alone does not diagnose an eating disorder. In fact, no test or screening instrument has been shown to be highly efficient as the sole means of identifying an eating disorder, but EAT 26 is particularly useful tool for assessing "eating disorder risk", for people who attend high school and college, and who are members of special risk groups such as athletes, dancers or models. To complete the EAT-26, participants rate their agreement with statements about weight and food. The EAT -26 original factor analysis study showed three interrelated subscales i.e. dieting, oral control and food preoccupation. Participants rate the intensity of attitudes from six possible options, *never*, *rarely*, *sometimes* (0), *often* (1), *very often* (2), and *always* (4).The first three responses are scored as zero, while the other three responses being scored as 1, 2, and 3 accordingly. A score greater than 20 is considered to be an indicator of abnormal eating habits and concerns about weight and should seek clinical help for further assessment of eating disorder. The alpha coefficients of EAT-26 ranged from .89 to .93. It was expected that Disordered Eating Behavior Scale would be positively associated with EAT-26 scale.

Procedure. The participants were administered the two scales, with special instructions to go through each item carefully and to give their responses by selecting that response category which best described the eating behavior practiced by them. The participants were requested not to skip any of the items on the two scales. The questionnaires were completed anonymously, and the participation in the study was voluntary. To investigate the relation between the two measures of disordered eating behavior, correlation estimates were computed.

Results. As proposed, results showed that the two scales were strongly correlated (r = .64, p < .01). The correlation of the two subscales of DEBS was also computed with the two subscales of EAT-26 (i.e., Eating Withdrawal and Overeating subscales of DEBS were correlated with Dieting and Food Preoccupation and Bulimia subscale of EAT-26, respectively. Significant positive correlations were yielded between the Eating Withdrawal and Dieting (r = .66, p < .01), Overeating and Food Preoccupation and Bulimia (r = .62, p < .01); thereby establishing the convergent validity of the scale.

Discriminant Validity. It is degree to which a construct can be empirically differentiated, or discriminated from other constructs. Measures of constructs that theoretically should not be related to each other are, in fact, observed to not be related to each other, that is, discriminating between dissimilar constructs (Campbell & Fiske, 1959).

Sample. Seventy four female and sixty six male (N = 140) participants with age ranging from 16-24 years (M = 20.1, SD = 2.2), belonging to different public and private educational institutes participated in the present study.

Instrument. The discriminant validity of the DEBS was established by evaluating its relation with the Rosenberg Self-esteem Scale (RSES; Rosenberg, 1965). RSES is most extensively used instrument to assess self- esteem. It is a unidirectional instrument elaborated from a phenomenological conception of self-esteem that captures subjects' global perception of their own worth by means of a 10 item scale, 5 positively worded items and 5 negatively worded items. The items are rated on a four point Likert type scale, ranging from 1 (*totally disagree*) to 4 (*totally agree*). Scales range from 10 to 40, with higher scores indicating higher self-esteem.

Procedure. The participants were administered the two scales, i.e. DEBS and RSES, selected for discriminant validity check. Participation was voluntary.

Results. Results indicate that there was significant negative correlation between DEBS and RSES (r = -.19, $p < .05$), suggesting that people having disordered eating behaviors have low self-esteem (Mintz, O'Halloran, Mulholland, & Schneider, 1997).

Discussion

Contemporary research indicates that disordered eating behaviors are prevalent in Pakistani population; however, there is no specific indigenous instrument available to measure these behaviors (Muazzam & Khalid, 2008). There was a need to focus upon the development of a measure to assess disordered eating behavior that might particularly address eating patterns of Pakistani youth in their

specific cultural context. The development of this measure is well justified as each culture has its own expressions and meanings for same construct. Different cultures have different relevance for same construct. Culture plays crucial role in developing eating patterns, therefore, current study emerges with the phenomenological approach.

As far as the already existing self-report measures (Fairburn & Beglin, 1994; Garner et al., 1982; Nevonen & Broberg, 2001; Sunday et al., 1995) of disordered eating behaviors are concerned, some of them largely focus on dieting and food preoccupation behavior and in this way overlook the important psychological domains i.e. social pressures for eating and eating choices and habits. Studies suggest that these domains are the most profound elements that affected an individual's eating behavior (Shelby, 2000; Smolak et al., 2000). The newly developed scale includes the two new factors i.e., Social Pressures for Eating and Eating Choices and Habits. Moreover, it focuses the importance of peer pressure and family on eating practices based on local experiences.

Current research was conducted in three phases with different studies. The scope of the study was quite large as different samples were taken in each validation study and total 590 participants were included in the complete research. The most difficult part of the research was to access the patients of eating disorder diagnosed by clinician as very few patients report their problems in clinical settings. This further highlight the need to create awareness in general population and to screen them at a very early stage before disordered eating emerges into a full blown eating disorder. During the factor analysis varimax rotation was used. Varimax rotation is the simplest solution from the infinity of rotations which predicts the precision and clear interpretation of each factor (Kaiser, 1974). The four factors that emerged through factor analysis were named as Eating Withdrawal, Overeating, Eating Choices and Habits, and Social Pressure for Eating whereas the last two were almost entirely the new concepts. The importance of social pressures for eating and eating choices and habits are well established in the contemporary research (Mumford et al., 2002).

Validation studies were the most interesting but difficult part of the current research. While establishing the construct validity through method of contrasted groups, it was very difficult to make the groups comparable, so age was taken as matched variable and the age of control group was decided in the light of mean age of patients participated in the said study. To establish the convergent validity, it was found that it correlated significantly with EAT-26. A positive correlation with EAT-26 does not minimize the importance of

developing indigenous scale as there is large variation in cultural permissiveness in experience of these behaviors. Discriminant validity was ensured by obtaining the negative correlation between DEBS and RSES. The inverse relationship among the said variables is well established in the research (Mintz et al., 1997).

As the psychometric strength of the scale is established on well ground, it can be used with number of future studies for health psychologists, general health practitioners, dietitians, nutritionist, and mental health workers. It can be used to study varied eating patterns on Pakistani cohort, depending on the variability of the problem to help develop and monitor better counseling services in the community.

Limitations and Suggestions

The prime limitation of the present study was that the sample was drawn only from the educated population of urban area, thus, findings cannot be generalized to whole population. Given the heterogeneity of Pakistani society, it is important to assess if similar effects might arise in rural population. The sample size of the current study was not very large, hence, can be replicated on larger sample for future studies. The scale requires future validation against large clinical population (i.e. Diagnosed patients of eating disorders according to DSM IV-TR, 2000). The development of DEBS is a first step forward to prime detection and possibility of timely guidance and treatment. Follow up studies are strongly recommended to strengthen the reliability and validity. The scale primarily focuses the young population; therefore, it is restricted to assess disordered eating in young adults only. Future researches also need a criterion group to determine the validity index of DEBS.

Implications

This is a very first kind of work in Pakistan with reference to eating behaviors of Pakistani youth. This study described the use of phenomenological approach and fairly exposes the construct of disturbed eating in indigenous perspective. This model can be used in future researches in order to develop culturally relevant tools. Results indicate that eating patterns are contributing factors in maintenance of health. This scale can be used as an adjunct to other diagnostic criteria to identify mental and physical health issues in indigenous sample.

This scale can be useful to identify the person who is at the risk to develop eating disorders. In future, it can be used in further studies to see its phenomenology in different health conditions, mental disorders, and personality constructs. Understanding the role of culture may be important in shedding light on socially and culturally relevant eating patterns. These patterns may comprise important factors for behaviors indicating risk for full blown eating disorders (Suhail & Nisa, 2002). As the data related to current study is lacking in Pakistani perspective, it will open up new horizons for upcoming researchers.

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