

## Alexithymia and its Relationships with Eating Behavior, Self Esteem, and Body Esteem in College Women

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The aim of this study was to estimate prevalence rate of alexithymia and eating disorder (ED) as well as to explore the relationships between alexithymia and eating behavior, self esteem, and body esteem in non-clinical college women. A total of 313 Japanese college women were asked to make entries of age, height, and body weight, and to answer the full items in the Japanese version of the Toronto Alexithymia Scale (TAS-20), Eating Attitude Test (EAT-26), Rosenberg Self Esteem Scale (RSES), and Body Esteem Scale (BES). The frequency of alexithymics who scored 61 points or more of the TAS-20 was 28.7%, and the frequency of students with potential ED who scored 20 points or more of the EAT-26 was 8.7%. The prevalence of potential ED in the alexithymics (14.0%) was significantly higher than that in the non-alexithymics (6.5%). The mean values of the RSES and BES scores were significantly different between the alexithymic and non-alexithymic groups. The TAS-20 scores were unrelated to the age and body mass index, but were significantly correlated to the EAT-26 (total score ( $r = 0.12$ ,  $p = 0.04$ ), bulimia and food preoccupation ( $r = 0.14$ ,  $p = 0.01$ )), the RSES ( $r = -0.44$ ,  $p < 0.001$ ), and BES (total score ( $r = -0.22$ ,  $p < 0.001$ ), appearance ( $r = -0.23$ ,  $p < 0.001$ ), and weight ( $r = -0.12$ ,  $p = 0.04$ )). These results suggest that, in non-clinical college women, alexithymia is a common psychological characteristic that is strongly correlated with self esteem and body esteem and that may influence eating behavior.

### INTRODUCTION

Nemiah and Sifneos (18) described alexithymia as a syndrome characterized by a deficit in the experiences and expression of feelings and a paucity of imaginable experience, resulting in a style of thought devoid of fantasy and metaphor. Alexithymic individuals are characterized by difficulties in recognizing and verbalizing feelings, paucities of fantasy life, concrete speech, and thought closely tied to external events (26, 28). Alexithymia was assessed by the Toronto Alexithymia Scale (TAS-20) which is a well-validated self-report scale composed of 20 items (1).

Alexithymia was initially reported to be common in psychosomatic patients who have difficulty in constructing satisfactory relationships with therapists and in completing psychological and behavioral programs. But later, these characteristics were found in many neuropsychiatric disorders such as depression, substance use disorder, posttraumatic stress disorder, panic disorder, and somatoform pain disorder. These characteristics were also found in non-clinical subjects. In non-clinical subjects, the rate of alexithymia is reported to vary between 0% and 28% (22).

Recent studies have demonstrated that alexithymia is also commonly found in patients with anorexia nervosa (AN) (2, 19), bulimia nervosa (BN) (11) and binge eating disorder (BED) (3). The prevalence rates of alexithymia have been shown to vary from 23% to 77% among patients with AN (7) and from 24% to 62.5% among patients with BED (3, 6, 20). One of the salient features of alexithymia is the inability to distinguish one's feelings from the accompanying bodily sensations. The characteristics of alexithymia are very similar to those of eating disorder. For example, patients with AN have difficulties in identifying and reporting their emotions (19). Patients with BN had significantly higher TAS scores than did the controls. They appeared to have a deficit in the experience and expression of feelings (11). In addition, two subscale scores of the TAS-20, the difficulties in identifying and describing feelings, were significantly associated with more severe BED, as well as with the presence of depressive symptoms, lower self esteem, and higher body dissatisfaction (3). The two characteristics of alexithymia, the difficulties in identifying and describing feelings, were associated with lack of maternal care and are a risk factor for eating disorder (8).

In individuals with alexithymia, negative feelings about one's body appear to be related to abnormal eating behaviors. Both self esteem and body esteem are also implicated in the pathogenesis of eating disorder (14). De Berardis et al. (4) hypothesized that alexithymia plays an indirect role in the pathogenesis and maintenance of abnormal eating behaviors and in promoting depressive symptoms and lower self esteem. Abnormal eating behaviors may worsen self esteem and the feelings about one's body.

The aims of the present study were 1) to establish whether alexithymia is present in non-clinical Japanese college women, 2) to compare body mass index (BMI), eating behavior, self esteem, and body esteem in alexithymics and non-alexithymics, 3) to determine risk factors associated with alexithymia, and 4) to compare the prevalence rates of potential ED in alexithymics and non-alexithymics.

## **MATERIALS AND METHODS**

### **1. Participants**

The subjects for this study were 313 female students who were enrolled in either a child-care course or a welfare course at several women's colleges in the west of Japan. All subjects were ethnically Japanese and none were being treated for any psychiatric disorders at the time of the study. The mean age  $\pm$  SD was  $19.0 \pm 0.9$  years and mean BMI  $\pm$  SD was  $20.5 \pm 6.3$ .

### **2. Procedure**

All subjects were informed of the aim of the study and were assured of privacy protection both orally and in writing. The subjects were given questionnaires and filled out them. All responses were written and thus remained confidential. They were asked to enter their age, height, and body weight and to answer all items of the Japanese version of the Eating Attitude Test (EAT-26), Rosenberg Self Esteem Scale (RSES), Body Esteem Scale (BES), and the 20-item Toronto Alexithymia Scale (TAS-20).

### **3. Assessments**

#### **3-1. Toronto Alexithymia Scale (TAS-20)**

Alexithymia was measured by using the TAS-20, the widely used measure of alexithymia (1). The TAS-20 consists of three subscales. Factor 1 assesses the difficulty of identifying feelings; factor 2 assesses the difficulty of describing feelings; factor 3 assesses externally oriented thinking. Possible answers to each item on the TAS-20 and their scores were

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strongly disagree = 1, disagree = 2, neither agree nor disagree = 3, agree = 4, strongly agree = 5, so that the total score ranged from 20 to 100 points. Following Taylor et al. (27), we judged scores of 61 and above as indicating an alexithymic state. Komaki et al. (13) confirmed the reliability of rechecking and factorial validity of the Japanese version of TAS-20. In our study, Cronbach's  $\alpha$  was 0.78.

### **3-2. Eating Attitude Test-26 (EAT-26)**

Eating Disorders were assessed by the EAT-26 (9, 10), which consists of 26 items and three factors. Factor 1 assesses dieting, factor 2 assesses bulimia and food preoccupation and factor 3 assesses oral control. Possible responses to each item and their scores were never = 0, rarely, sometimes = 0, often = 1, usually = 2, or always = 3 (item 25 is a negative key item on the EAT-26). The total score thus ranges from 0 to 78 points. Subjects who scored over 20 were categorized as being at risk for developing an eating disorder. Mukai et al. (17) confirmed the reliability of rechecking and factorial validity of the Japanese version of EAT-26. In our study, Cronbach's  $\alpha$  was 0.73.

### **3-3. Rosenberg Self Esteem Scale (RSES)**

The RSES was used to evaluate self esteem. The RSES (23) consisted of 10 items and one factor (self esteem). Possible answers to each item on the RSES and their scores were strongly disagree = 1, disagree = 2, neither agree nor disagree = 3, agree = 4, strongly agree = 5, so that the total score ranged from 10 to 50 points. A higher score indicates higher self esteem. The Japanese version of RSES has been previously validated (29). In our study, Cronbach's  $\alpha$  was 0.81.

### **3-4. Body Esteem Scale (BES)**

The BES (15) consists of 23 items and three factors: (i) Appearance; general feelings about appearance (e.g., I like what I see in the mirror), (ii) Weight; weight satisfaction (e.g., weighing myself depresses me), and (iii) Attribution; attributions to other of positive evaluations regarding one's body or appearance (e.g., my good looks help me to get dates). Possible answers to each item on the BES and their scores were never = 0, seldom = 1, sometimes = 2, often = 3, always = 4. The total score thus ranges from 0 to 92 points. A higher score indicates higher body esteem. The Japanese version of BES has been previously validated (25). In our study, Cronbach's  $\alpha$  was 0.85.

## **4. Data analyses**

All statistical calculations were performed using the SPSS (Ver.13.0 SPSS, Japan).

Cronbach's  $\alpha$ -coefficient was used to investigate the internal consistency of scales in the EAT-26, RSES, BES, and TAS-20. Significance was set at 5% for all tests.

The data were compared using Student's t-test and the Mann-Whitney's U-test. The Kolmogorov-Smirnov test was used to determine whether the data were normally distributed. Normally distributed data were analyzed with Student's t-test and Pearson correlation analysis and non-normally distributed data were analyzed with Mann-Whitney's U-test and Spearman correlation analysis. A multiple linear regression analysis was used to assess the relative contributions of BMI, RSES, BES, and EAT-26 account to Alexithymia. Spearman's rho (r) correlation test was used to evaluate the correlation among the variables.

**RESULTS**

Data processing of missing values with the list-wise deletion was performed. Analysis was performed using data from 300 of the 313 students.

Eighty-six of college women (28.7%) had a score of 61 higher than 60 on the TAS-20 and were therefore considered as alexithymic. The mean age, BMI and test score for the alexithymic and non-alexithymic groups are shown in Table I. There were no statistical differences between the alexithymic and non-alexithymic groups in terms of age ( $z = 0.15$ ,  $p = 0.88$ ) or BMI ( $z = -1.20$ ,  $p = 0.23$ ). The alexithymic group had higher mean values of the EAT-26 in total score ( $11.6 \pm 7.9$ ) than did the non-alexithymic group ( $9.9 \pm 6.3$ ), but the difference was not significant ( $z = 1.60$ ,  $p = 0.11$ ). In the bulimia and preoccupation subscales of the EAT-26, the scores showed a trend difference between the alexithymic and non-alexithymic groups ( $z = -1.87$ ,  $p = 0.06$ ). The RSES total and BES total scores were significantly different between the alexithymic and non-alexithymic groups ( $z = -6.69$ ,  $p < 0.001$  and  $z = 3.99$ ,  $p < 0.001$ , respectively). The alexithymic group had significantly lower mean values of the RSES total and BES total scores ( $25.4 \pm 6.4$  and  $23.3 \pm 11.6$ , respectively) than did the non-alexithymic group ( $31.4 \pm 6.1$  and  $29.4 \pm 13.0$ , respectively). Two subscales of the BES scores (appearance and weight) were also significantly lower for the alexithymic group than for the non-alexithymic group.

**Table I.** Age, BMI and test scores of alexithymics and nonalexithymics

	Overall (n = 300)	Alexithymics (n = 86)	Nonalexithymics (n = 214)	Significance (df = 298)
	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD	
Age (year)	19.0 $\pm$ 0.9	19.1 $\pm$ 1.0	19.1 $\pm$ 0.9	$z = -0.15$ , $p = 0.88$
BMI (kg/m <sup>2</sup> )	20.5 $\pm$ 2.5	20.3 $\pm$ 3.0	20.5 $\pm$ 2.3	$z = -1.20$ , $p = 0.23$
EAT-26 Total Score	10.4 $\pm$ 6.8	11.6 $\pm$ 7.9	9.9 $\pm$ 6.3	$z = -1.60$ , $p = 0.11$
Dieting	7.4 $\pm$ 5.0	7.9 $\pm$ 5.4	7.1 $\pm$ 4.8	$z = -1.07$ , $p = 0.29$
Bulimia and food preoccupation	1.2 $\pm$ 2.1	1.7 $\pm$ 2.6	1.0 $\pm$ 1.8	$z = -1.87$ , $p = 0.06$
Oral Control	1.8 $\pm$ 2.3	2.0 $\pm$ 2.5	1.7 $\pm$ 2.3	$z = -0.85$ , $p = 0.40$
RSES Total Score	29.6 $\pm$ 6.8	25.4 $\pm$ 6.4	31.4 $\pm$ 6.1	$z = -6.69$ , $p < 0.001$
BES Total Score	27.7 $\pm$ 12.9	23.3 $\pm$ 11.6	29.4 $\pm$ 13.0	$t = 3.99$ , $p < 0.001$
Appearance	12.2 $\pm$ 6.5	9.7 $\pm$ 5.6	13.3 $\pm$ 6.5	$z = -4.24$ , $p < 0.001$
Weight	11.2 $\pm$ 6.3	9.8 $\pm$ 5.9	11.7 $\pm$ 6.4	$t = 2.40$ , $p = 0.017$
Attribution	4.2 $\pm$ 3.5	3.7 $\pm$ 3.2	4.4 $\pm$ 3.7	$z = -1.23$ , $p = 0.22$
TAS-20 Total Score	54.0 $\pm$ 10.6	66.3 $\pm$ 5.3	49.0 $\pm$ 7.8	$z = -13.55$ , $p < 0.001$
Difficulty identifying feelings	18.0 $\pm$ 6.5	25.1 $\pm$ 4.4	15.2 $\pm$ 5.0	$z = -11.88$ , $p < 0.001$
Difficulty describing feelings	15.9 $\pm$ 3.9	19.4 $\pm$ 2.7	14.4 $\pm$ 3.4	$z = -1.10$ , $p < 0.001$
Externally oriented thinking	0.1 $\pm$ 4.0	21.9 $\pm$ 3.3	19.3 $\pm$ 4.1	$z = -4.92$ , $p < 0.001$

$z =$  Mann-Whitney's  $z$  value,  $t =$  Student's  $t$  value.

The TAS-20 score was positively correlated with the EAT-26 total score and with a subscale of the EAT-26 score (bulimia and food preoccupation), and negatively correlated with the RSES total score, BES total score, a subscale of the BES scores (appearance) and a subscale of the BES scores (weight) (Table II).

A multiple linear regression analysis with TAS-20 scores as dependent variables and potential predictive factors as independent variables was conducted in order to determine the

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contribution of the variables to the risk for alexithymia in the college women. As a result, the RSES was significantly associated with higher risk for alexithymia. (Table III).

Of the 300 students, 26 (8.7%) had potential ED (i.e., scored 20 points or more of the EAT-26). The prevalence of potential ED in the alexithymics (14.0%) was significantly higher than that in the non-alexithymics (6.5%) ( $\chi^2 = 4.26$ , d.f = 1,  $p = 0.039$ , odds ratio 2.31, 95% confidence interval 1.02-4.59) (Table IV).

**Table II.** Correlations of characteristics and test scores with the TAS-20 total score

Characteristic/Test	r
Age (year)	-0.04
BMI (kg/m <sup>2</sup> )	-0.05
EAT-26 Total Score	0.12*
Dieting	0.07
Bulimia and food preoccupation	0.14*
Oral Control	0.06
RSES Total Score	-0.44***
BES Total Score	-0.22 <sup>†††</sup>
Appearance	-0.23***
Weight	-0.12 <sup>†</sup>
Attribution	-0.11

<sup>†</sup>  $p < 0.05$ , <sup>†††</sup>  $p < 0.001$  by Pearson's correlations.

\*  $p < 0.05$ , \*\*\*  $p < 0.001$  by Spearman's correlations.

**Table III.** Results of linear regression analyses of EAT-26, RSES, and BES in TAS-20

Variable	B	SE B	$\beta$
EAT-26	0.16	0.09	0.10
RSES	-0.75	0.09	-0.48***
BES	0.02	0.05	0.03

B: un-standardized coefficients, SE B: standard error of B values,

$\beta$ : standardized coefficients

\*\*\*  $p < 0.001$

**Table IV.** Prevalence of the potential ED in alexithymic subjects in the college women.

Group	non ED (n=274)	potential ED (n=26)	Significance
Non-alexithymics (n=214)	200 (93.5%)	14 (6.5 %)	$\chi^2=4.26$ , d.f=1, $p=0.039$
Alexithymics (n=86)	74 (86.0%)	12 (14.0 %)	

## DISCUSSION

In this study, we explored the prevalence and characteristics of alexithymia and the relationships between alexithymia and eating behavior, self esteem, and body esteem in non-clinical college women. Our principal findings are: 1) the prevalence of alexithymia in non-clinical college women is relatively high (28.7%), 2) the frequency of potential ED is significantly higher in the alexithymics (14.0%) than in the non-alexithymics (6.5%), 3) the TAS-20 is positively correlated with the EAT-26 and negatively correlated with the RSES

and the BES, and 4) the low RSES score is a predictive factor for alexithymia. Our findings confirmed previous findings that alexithymics had a higher risk for ED and lower self esteem and body esteem (4).

Estimates of the prevalence of alexithymia in the general population have varied from 13% to 19% (12, 21, 24), which are lower than our estimate of 28.7% among non-clinical college women. Moriguchi et al. reported that the total score of the TAS-20 is negatively correlated with age (16). The TAS-20 total scores, reflecting the difficulties in identifying and describing feelings scores were high in teenagers, decreased with age until the age of about 30 and then remained relatively unchanged. Because our subjects were young college women with an average age of 19, our results need to be interpreted cautiously. In addition, we recruited the students from either a child-care course or a welfare course at several women's colleges. Therefore, our samples might contain a selection bias.

As we predicted, the frequency of potential ED was significantly higher in the alexithymics than in the non-alexithymics. Although the EAT-26 total and bulimia food preoccupation scores were not significantly different between the alexithymic and non-alexithymic groups, these two scores were positively correlated with the TAS-20 total scores. Carano et al. reported alexithymia was associated with severe BED (4). They found that individuals with alexithymia and BED had poorer appearance evaluation and poorer body satisfaction than individuals without alexithymia. The concept of "bulimia and food preoccupation" includes an obsessive-compulsive factor. De Berardis et al. (5) suggested a strong connection between alexithymia and obsessive-compulsive behavior. On the other hand, the subscales of EAT-26 "Dieting" and "Oral control" were not significantly correlated with the TAS-20 total scores. Therefore, our findings of positive correlation between the TAS-20 and the subscale of EAT-26 "bulimia and food preoccupation" may imply that alexithymia underpins especially the pathogenesis of bulimia nervosa. Further studies are required to explore the relationships between alexithymia and different subtypes of eating disorder.

In addition, the RSES and the BES scores were significantly lower in the alexithymics than in the non-alexithymics. In contrast, the BMI scores were not different between the two groups. The relationships between abnormal eating attitude and negative feelings about one's body and low self esteem have been widely observed (4, 14). Our findings imply that both low self esteem and low body esteem might be associated with alexithymia. It is a future study to explore whether low self esteem and low body esteem are primary underlying causes of alexithymia or not. In addition, alexithymics may not be concerned with body size per se, they are distressed about their own body image, even though they have normal standard body weight.

The linear multiple regression analysis revealed that lower self esteem could predict individuals with alexithymia. Because lower self esteem is also an important risk factor for eating disorder, to evaluate and raise one's self esteem may be an effective method for preventing alexithymia and eating disorder. Clearly, it is important to encourage college women to identify and express their feelings.

This study has several limitations. All the data studied here were collected by self-report measures. Another limitation is that the results of this study cannot be generalized to men and the general population. Finally, we did not evaluate the depression state of the subjects, because depression is also suggested to be associated with alexithymia and self esteem (4). Despite these limitations, we revealed that alexithymia is common in Japanese college women and that alexithymia is strongly correlated with self esteem and body esteem and may influence eating behavior.

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