

University of Groningen

Gender differences in the association between alexithymia and emotional eating in obese individuals

Larsen, Junilla K.; Strien, Tatjana van; Eisinga, Rob; Engels, Rutger C.M.E.

Published in:
Journal of Psychosomatic Research

DOI:
[10.1016/j.jpsychores.2005.07.006](https://doi.org/10.1016/j.jpsychores.2005.07.006)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2006

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Larsen, J. K., Strien, T. V., Eisinga, R., & Engels, R. C. M. E. (2006). Gender differences in the association between alexithymia and emotional eating in obese individuals. *Journal of Psychosomatic Research*, 60(3), 237. <https://doi.org/10.1016/j.jpsychores.2005.07.006>

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

Gender differences in the association between alexithymia and emotional eating in obese individuals

Junilla K. Larsen^{a,b,*}, Tatjana van Strien^{a,b}, Rob Eisinga^c, Rutger C.M.E. Engels^d

^aDepartment of Clinical Psychology, Radboud University Nijmegen, 6500 HE Nijmegen, The Netherlands

^bInstitute for Gender Studies, Radboud University Nijmegen, 6500 HE Nijmegen, The Netherlands

^cDepartment of Methodology and Statistics, Radboud University Nijmegen, 6500 HE Nijmegen, The Netherlands

^dBehavioral Science Institute, Radboud University Nijmegen, 6500 HE Nijmegen, The Netherlands

Received 8 March 2005; received in revised form 7 June 2005; accepted 14 July 2005

Abstract

Objective: Women have been reported to use more emotion-regulation strategies than do men and to have more abilities to regulate their emotions in a different way. The aim of the present study was to examine gender differences in the relationships of alexithymia, negative mood, and the combination of alexithymia and negative mood with emotional eating in obese persons. **Methods:** Four hundred thirteen obese individuals [343 females and 70 males, aged 18–60 years, mean=43.6 years, body mass index (BMI)= 38.4 ± 6.6 kg/m²] completed self-report questionnaires, including the Symptom Checklist-90 (SCL-90) question-

naire, the Dutch Eating Behavior Questionnaire (DEBQ), and the Toronto Alexithymia Scale (TAS). **Results:** Hierarchical regression analysis showed a significant interaction between gender and alexithymia. More difficulty in identifying or describing feelings was specifically associated with more emotional eating in men. **Conclusion:** These findings suggest that alexithymia is more strongly involved in emotional eating of obese men than women. This offers indications for designing gender-specific treatments for emotional eating among obese persons.

© 2006 Elsevier Inc. All rights reserved.

Keywords: Alexithymia; Emotional eating; Gender differences; Depression; Obesity

Introduction

The normal response to emotional arousal is loss of appetite, followed by a decrease of food intake, as emotional arousal inhibits gastric hunger contractions [1] and leads to the liberation of sugar from the liver into the bloodstream [2]. Some individuals, however, respond to emotional arousal by enlarging their food intake. This so-called emotional eating is, according to psychosomatic theory, more frequent in obese individuals and is the result of learning experiences early in life in which food was used

as a way of coping with psychological problems [3]. Due to these early learning experiences, some individuals may have developed a poor interoceptive awareness: difficulties in recognizing and accurately identifying emotions and visceral sensations related to hunger and satiety [4]. Interoceptive awareness is highly associated with alexithymia, which is a multifaceted construct encompassing difficulty identifying subjective emotional feelings and distinguishing between feelings and the bodily sensations of emotional arousal, difficulty describing feelings to other people, an impoverished fantasy life, and a stimulus-bound, externally oriented, cognitive style, as originally defined by Nemiah et al. [5].

While interview and questionnaire studies have consistently found support for the concept of emotional eating in obese individuals [6,7], no support for this concept was obtained in early experimental studies [8–10], possibly as

* Corresponding author. Department of Clinical Psychology, Radboud University Nijmegen, P.O. Box 9104, 6500 HE Nijmegen, The Netherlands. Tel.: +31 24 3615924; fax: +31 24 3615594 (secretariat).

E-mail address: j.larsen@maw.ru.nl (J.K. Larsen).

a result of the emotional manipulation with labelled, controllable emotional states [11]. Experimental studies in which the source of the elicited negative emotions was diffuse and uncontrollable have found that the obese overeat in comparison with the nonobese [12,13]. This overeating after diffuse and uncontrollable emotions suggests a role for alexithymia in emotional eating.

A previous study has found a relationship between interoceptive awareness and emotional eating among females [14]. In addition, difficulty in identifying feelings has shown to be associated with emotional eating among obese females with binge eating disorder, but not among those without binge eating disorder [15]. So far, no studies have examined the relationship between alexithymia and emotional eating in men.

Gender differences in emotional adjustment and emotional eating have consistently been reported, with women showing more depressive symptoms [16], being more emotionally expressive [17–19], using more emotion-regulation strategies [20], and showing more emotional eating [21] than men do. Whereas an incidental study has observed no association between alexithymia and gender [22], most large-scale studies in general population samples have found that men show more alexithymia than women do [23,24]. In addition, the relationships between alexithymia and psychological or medical problems may well be gender specific. Women have been reported to use more emotion-regulation strategies than men do and to have more abilities to regulate their emotions in a different way [20]. We hypothesize that the associations between alexithymic characteristics and emotional eating problems are stronger for men than for women. A previous study found that alexithymia was associated with the frequent use of health care among men, but not among women [25].

The aim of the present study was to examine gender differences in the relationships of alexithymia, negative mood, and the combination of alexithymia and negative mood with emotional eating in obese individuals. Support for a gender-specific emotional eating model would be clinically useful, because it offers indications for designing gender-specific treatments for emotional eating.

Method

Participants

Participants were recruited in three ways: through advertisements in both local newspapers ($n=545$) and in an obesity journal of the Dutch patients' association of obesity ($n=175$), and by intake screening in an obesity clinic ($n=84$). This was done to obtain a sufficiently large obese sample. In the advertisements, people were offered a personal eating diagnosis in return for their participation. Inclusion criteria for this study were a body mass index (BMI) ≥ 30 kg/m² and < 60 kg/m² and age ≥ 18 and < 60 years. Twenty-one respondents recruited through advertisements in local newspapers were excluded because they filled out an electronic instead of a paper version of the questionnaires, and the Symptom Checklist-90 (SCL-90) questionnaire items were not included in the electronic version. There were no differences in weight and demographic characteristics between respondents who completed the electronic questionnaires and those who completed the paper questionnaires ($P > .10$). The final selected obese group consisted of 200 individuals recruited through advertisements in local newspapers, 144 individuals recruited by way of the obesity journal, and 69 individuals from the obesity clinic. Table 1 provides an overview of demographic and weight data of the obese men and women in the different samples.

Analyses of variance with sample and gender as subgroup factors showed that men in this study were, on average, older than women ($F=11.21$, $P=.001$). No significant differences between the sexes were found for BMI and educational level ($P > .10$). The samples differed in age ($F=5.38$, $P=.005$) and BMI ($F=59.78$, $P < .001$). People recruited through advertisements in local newspapers were, on average, older ($P < .05$) and had a lower BMI ($P < .001$) than did the people from the other two samples, and people from the obesity journal had, on average, a higher BMI than did people from the obesity clinic ($P < .001$). There were no significant interactions between sample and gender, neither for age and BMI nor for any of

Table 1
Demographic characteristics and BMI of female and male participants in the different samples

	Local newspapers						Obesity journal						Obesity clinic					
	Women			Men			Women			Men			Women			Men		
	<i>n</i>	<i>M</i>	<i>S.D.</i>	<i>n</i>	<i>M</i>	<i>S.D.</i>	<i>n</i>	<i>M</i>	<i>S.D.</i>	<i>n</i>	<i>M</i>	<i>S.D.</i>	<i>n</i>	<i>M</i>	<i>S.D.</i>	<i>n</i>	<i>M</i>	<i>S.D.</i>
Age	160	44.7	9.5	40	48.2	7.6	135	42.0	9.2	9	49.6	5.8	48	40.0	10.1	21	43.4	9.8
BMI (kg/m ²)	160	34.7	4.4	40	33.9	2.9	135	42.9	6.0	9	46.3	6.8	48	40.1	6.6	21	39.4	5.5
Educational level ^a	<i>n</i>	%		<i>n</i>	%		<i>n</i>	%		<i>n</i>	%		<i>n</i>	%		<i>n</i>	%	
Primary	19	12.1		4	10.0		14	10.5		–	0.0		3	6.5		1	5.3	
Secondary	80	51.0		17	42.5		68	51.1		4	44.4		21	45.7		6	31.6	
Tertiary	58	36.9		19	47.5		51	38.4		5	55.6		22	47.8		12	63.1	

^a Educational level information was missing for nine individuals.

the main research variables (emotional eating, alexithymia, and depression) in this study ($P > .10$). This finding suggests that the influence of gender on the demographic and main research variables is similar for all three samples. Hence, the three samples were combined to obtain a sufficiently large obese sample for the gender-specific analyses in this study.

Measurements

To measure emotional eating, the emotional eating scale of the Dutch Eating Behavior Questionnaire (DEBQ) was used [26]. This scale has been found to be a valid and reliable instrument for evaluating emotional eating (e.g., “do you have a desire to eat when you are irritated”) in normal participants, women with eating disorders, and obese patients [26,27]. In the present study, Cronbach’s α was .79.

The depression subscale of the validated Dutch version of the SCL-90 [28,29] was used to obtain an indication of depressive symptoms. In the present study, Cronbach’s α was .93.

Alexithymia was measured using the Toronto Alexithymia Scale-20 (TAS-20) [30,31], the short form of the original scale proposed by Taylor et al. [32]. The TAS-20 has a reliable and valid three-factor structure, with subscales for difficulty identifying feelings, difficulty describing feelings, and externally oriented thinking, in different languages and cultures [23,33]. In the present study, Cronbach’s α was .88 for difficulty identifying feelings, .79 for difficulty describing feelings, and .63 for externally oriented thinking. The α for the total scale was .86.

Statistical analyses

Our data comply with the suggested guidelines for normality, linearity, and homoscedasticity [34]. To examine gender differences in alexithymia and negative mood, t tests were used. To examine gender differences in emotional eating, analysis of variance with age as a covariate was used, as age was significantly correlated with emotional eating ($r = -.23$, $P < .001$). To examine the magnitude of significant results, effect sizes were computed by dividing the difference between the means of the two groups by the pooled standard deviation. Hence, the effect sizes may be viewed as the difference between the groups, expressed in standard deviation units. Effect sizes between 0.2 and 0.5 reflect a small effect, between 0.5 and 0.8, a moderate effect, and above 0.8, a large effect [35].

Hierarchical regression analyses were performed to examine whether the relationship between alexithymia and emotional eating differed significantly for males and females. The predictor variables were entered into the analyses in the following order: age and gender (0=male and 1=female; Step 1), depression and alexithymia (Step 2), the interaction between alexithymia and depression score (Step 3), and the interaction between gender and alexithymia (Step 4). A two-way interaction between gender and

depression was tested separately in Step 4, and combined two- and three-way (Gender \times Alexithymia \times Depression) interactions with gender were also tested. Analyses were performed separately for the total TAS and subscale scores. When significant interactions with gender were observed, separate hierarchical regression analyses were performed for men and women to further examine gender specificity in the relationships of alexithymic characteristics, negative mood, and their combination with emotional eating. Prior to the regression analysis, alexithymic and negative mood variables were centered on their grand mean (that is, the overall mean was subtracted from the values of a variable). An α level of .05 was used for all statistical tests. All analyses were performed with SPSS 11.5.

Results

Gender differences

The means for alexithymia, depression, and emotional eating are shown in Table 2. Sex differences were found for depression and emotional eating, with women reporting more depression ($t = -3.7$, $P < .001$), a difference of small magnitude, and more emotional eating ($F = 5.2$, $P < .05$), a difference of moderate magnitude, than do men. Alexithymia total score (total TAS-20 score) or subscale scores on difficulty identifying or describing feelings showed no significant sex differences ($P > .10$ and $d < .2$), but men reported more externally oriented thinking than women did ($t = 3.4$, $P < .01$). The magnitude of this difference was small (Table 2). When we controlled for depression, (marginally) significant sex differences were also found for difficulty describing feelings ($F = 2.9$, $P = .09$), difficulty identifying feelings ($F = 4.5$, $P < .05$), and total alexithymia scores ($F = 11.2$, $P < .01$), with men reporting more alexithymic features than women did.

Table 2
Means (M) and standard deviations of emotional eating, alexithymia, and depression scores of female and male obese participants

		<i>n</i>	<i>M</i>	S.D.	<i>P</i>	<i>d</i>
Emotional eating	Men	70	2.7	0.9	<.05	.62
	Women	343	3.2	0.8		
Alexithymia (total score)	Men	70	51.2	11.4	NS	
	Women	341	49.2	12.8		
Difficulty identifying feelings	Men	70	16.4	6.3	NS	
	Women	342	16.6	6.6		
Difficulty describing feelings	Men	70	13.5	4.2	NS	
	Women	342	13.3	4.7		
Externally oriented thinking	Men	70	21.3	4.1	<.01	.44
	Women	341	19.3	4.7		
Depression score	Men	70	25.3	10.0	<.001	.41
	Women	341	30.4	12.9		

For emotional eating, univariate analysis of variance of sex differences with age as covariate; for alexithymia and depression, t tests.

Gender-specificity in emotional eating

To examine our hypothesis that alexithymia is more strongly associated with emotional eating in men than in women, the interaction of alexithymia with gender was entered into the regression model in Step 4, following the inclusion of gender and age (Step 1), depression and alexithymia (Step 2), and the interaction between depression and alexithymia in Step 3 (Table 3). Gender and age significantly explained variations in emotional eating [$F_{\text{change}}(2,406)=19.80, P<.001$], as did depression and alexithymia [$F_{\text{change}}(2,404)=29.98, P<.001$], suggesting that women and people from lower age exhibit more emotional eating and that more depression and alexithymia are associated with more emotional eating. No significant interaction was found between depression and alexithymia [$F_{\text{change}}(1,4030)=1.65, P>.10$], but the interaction between gender and alexithymia was significant [$F_{\text{change}}(1,402)=5.70, P=.017$]. This finding suggests that alexithymia's effect on emotional eating is gender related. Two-way interactions between gender and depression and three-way interactions among gender, depression, and alexithymia were not significant ($P>.10$). When the three subscales of the TAS-20 were used as independent variables, the analyses revealed significant interactions between gender and the alexithymic characteristics difficulty identifying feelings [$F_{\text{change}}(1,403)=5.31, P=.02$] and difficulty describing feelings [$F_{\text{change}}(1,403)=7.70, P=.006$], but no interaction of gender with externally oriented thinking [$F_{\text{change}}(1,402)=.003, P=.959$].

To probe significant interactions between gender and alexithymic characteristics, individuals were categorized as low or high on alexithymic characteristics using a median split [36]. More difficulty in identifying or describing feelings was specifically associated with more emotional eating in men (Fig. 1).

The interactions were further examined by analyzing the sexes separately. Table 4 presents the correlation matrix of emotional eating, depression, and alexithymia variables for men and women. A higher level of emotional eating

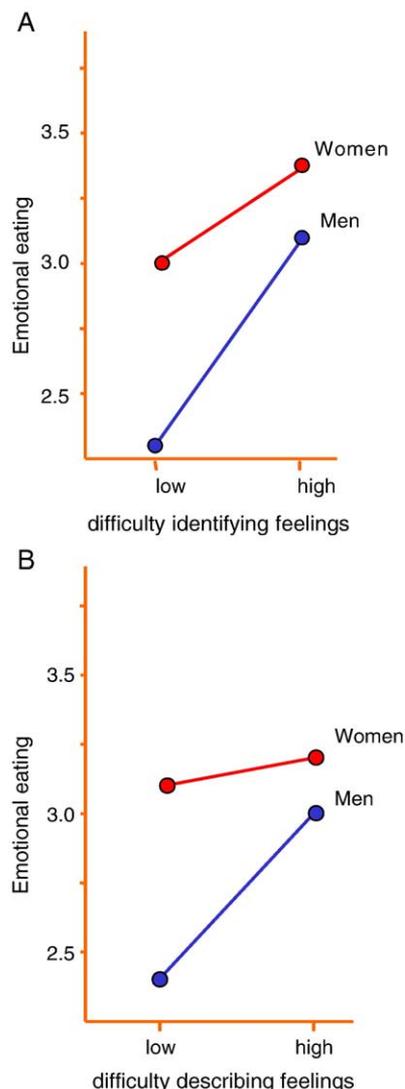


Fig. 1. Emotional eating scores for men and women with low or high scores on difficulty identifying feelings (A) and difficulty describing feelings (B).

Table 3
Hierarchical multiple regression analyses with emotional eating as the dependent variable (n=410)

		Emotional eating	
		β	ΔR^2
Step 1	Gender	.16***	.09***
	Age	-.18***	
Step 2	Depression	.34***	.12***
	Alexithymia	.32**	
Step 3	Depression×alexithymia	-.06	.00
Step 4	Gender×alexithymia	-.29*	.01*

* $P<.05$.
** $P<.01$.
*** $P<.001$.

correlated significantly with higher levels of alexithymia (variables difficulty identifying and describing feelings) and depression among men and women. However, Fisher's Exact Tests showed significant differences between men and women in the magnitude of significant correlations ($P<.05$), with significant correlations between alexithymia variables and emotional eating being stronger for men than for women.

Separate regression analyses were performed for each of the two alexithymia variables difficulty identifying feelings and difficulty describing feelings, to avoid spurious results due to collinearity (Table 5). Difficulty identifying feelings and depression together explained a significant amount of variance in emotional eating in men (27%) and women (12%), but when entered into the model along with difficulty identifying feelings ($\beta=.37, P<.01$), depression

Table 4
Pearson correlations among emotional eating, alexithymia, and depression for men (n=70) and women (n=340; shaded)

	1	2	3	4	5	6
1. Emotional eating		.40**	.50***	.41***	-.07	.44***
2. Alexithymia (total score)	.18**		.88***	.83***	.60***	.55***
3. Difficulty identifying feelings	.28***	.86 [†]		.65***	.24*	.68***
4. Difficulty describing feelings	.17**	.89***	.71***		.28*	.55***
5. Externally oriented thinking	-.05	.66***	.26***	.47***		.01
6. Depression	.35***	.53***	.61***	.43***	.19***	

*P<.05.
**P<.01.
***P<.001.

was no longer significantly associated with emotional eating in men. In men, both difficulty describing feelings ($\beta=.27, P<.05$) and depression ($\beta=.32, P<.01$) were significantly associated with emotional eating, explaining 25% of the variance in emotional eating. In women, 17% of the variance in emotional eating was explained, with age ($\beta=-.22, P<.001$) and depression ($\beta=.33, P<.001$) as significant variables.

Discussion

The main finding of our study is the presence of gender differences in the relationship of alexithymia with emotional eating in obese persons. Men showed stronger associations between alexithymic characteristics and emotional eating than did the women. Before discussing the main findings of this article, we reflect on the comparison of men and women on emotional eating, alexithymia, and depression scores.

We found that women showed more emotional eating and depression than men did, which is in line with previous studies [16,21]. Whereas an incidental study has observed no association between alexithymia and gender [22], most large-scale studies in general population samples have found that men score significantly higher than do women on the total TAS-20 scale and on the factors assessing difficulty describing feelings and externally oriented thinking [23,24,33]. In agreement with this, men in our study scored significantly higher than women did on externally oriented thinking. However, we did not observe significant gender differences on total TAS-20 scores and on the factor difficulty describing feelings. Considering that depression is more frequent among females than among males [16], and depression and alexithymia are positively associated [37–39], it is possible that depression influences the

strength of the relation between gender and alexithymia. This may specifically apply to obese samples in which, compared with normal samples, depression is relatively more frequent among women than among men [40]. We found that alexithymia was more strongly associated with gender when we controlled for depression. This suggests that future studies should take depression into account while examining gender differences in alexithymia.

We expected that the association between alexithymic characteristics and emotional eating would be stronger for men than for women. Alexithymic characteristics have been

Table 5
Separate hierarchical multiple regression analyses for males (n=70) and females (n=340) with emotional eating as the dependent variable

		Emotional eating			
		Men		Women	
		β	ΔR^2	β	ΔR^2
Regression with alexithymic characteristic DIF ^a					
Step 1	Age	-.01	.00	-.22***	.06***
Step 2	Depression	.19	.27***	.26***	.12***
	DIF	.37**		.13*	
Step 3	Depression×DIF interaction	-.22	.03	-.08	.01
Regression with alexithymic characteristic DDF ^b					
Step 1	Age	-.01	.00	-.22***	.06***
Step 2	Depression	.32**	.25***	.33***	.11***
	DDF	.27*		.02	
Step 3	Depression×DDF interaction	-.11	.01	-.01	.00

^a DIF=difficulty identifying feelings.
^b DDF=difficulty describing feelings.
* P<.05.
** P<.01.
*** P<.001.

shown to be associated with the frequent use of health care among men, but not among women [25]. Our study demonstrated that alexithymic characteristics were indeed more strongly associated with emotional eating among men than among women. In addition to depression, more difficulty in describing feelings was associated with more emotional eating in men, but not in women. Difficulty in identifying feelings was more strongly associated with emotional eating in men than in women. Whatever the exact mechanisms, our results suggest that alexithymic characteristics are more strongly involved in emotional eating of obese men than women. The clinical implication is that gender-specific treatments for emotional eating among obese persons attending for outpatient care may be indicated, with treatments for men being more strongly focused upon learning to identify and describe feelings than treatments for women. Dialectical behavioral therapy [41], specifically aimed at emotional dysregulation [42], may be particularly effective for men with emotional eating problems, but whether this type of therapy is indeed particularly more effective for men than for women compared with established psychotherapies such as cognitive-behavioral therapy and interpersonal therapy should be examined in a controlled-intervention trial.

Our study has some restrictions. Our study population consisted of obese participants who admitted for outpatient care (obesity clinic) or who probably were interested in a personal eating diagnosis, which they received in return for their participation. This idea is supported by the fact that the percentage of obese individuals in the local newspaper group was extremely high (40.6%: 221 out of 545) compared with the average percentage of obese individuals in the Netherlands (about 10%; [43]). Compared with obese gender-specific norm groups [21], both the obese men and women in our study had more emotional eating problems. Moreover, the majority of participants in our study consisted of women, while the prevalence of obesity is only slightly higher among women [43]. Thus, although our results do not generalize to a general obese population, they are suggested to generalize to obese men and women who are motivated to change their weight status. Our cross-sectional design prohibits drawing causal inferences and prohibits, for example, answering the question whether previous depressive episodes have influenced the relationship between current depressive symptoms and emotional eating. Future longitudinal research assessing predictors, moderators, and outcome variables repeatedly over time will enhance insight into the directionality of the relationships found. Like most researchers, we have used the TAS-20 as an alexithymia measure, which appears to be a reliable and factorial valid instrument [23,33]. However, it may emphasize the cognitive aspects of alexithymia [44]. Lumley [45] describes his observations of some people who were so alexithymic that they did not realize that they had an emotional deficit and responded to the TAS-20 as “normal” people might (with relatively low scores). In this study, we are interested in people with cognitive deficits in emotion

regulation who are hypothesized to seek other ways to express their distress by lacking the ability to identify emotional states and communicate their feelings. The TAS-20 appears to tap this alexithymia construct.

In conclusion, the present study shows that alexithymia is more strongly associated with emotional eating in obese men than women. This suggests that gender-specific treatments for emotional eating among obese persons may be indicated, with treatments for men being more strongly focused upon learning to identify and describe feelings, compared with treatments for women. However, before evaluating gender-specific treatments for emotional eating, future prospective studies should further examine this gender-specific emotional eating model.

References

- [1] Carlson PL. The control of hunger in health and disease. Chicago: The University of Chicago Press, 1916.
- [2] Cannon MB. Bodily changes in pain, hunger, fear and rage An account of recent research into the function of emotional excitement. New York: Appleton and Company, 1915.
- [3] Kaplan HI, Kaplan HS. The psychosomatic concept of obesity. *J Nerv Ment Dis* 1957;125:181–201.
- [4] Bruch H. Hunger awareness and individuation. In: Bruch H, editor. *Eating disorders: obesity, anorexia nervosa, and the person within*. New York: Basic Books, Inc, 1973. pp. 44–65.
- [5] Nemiah JC, Freyberger H, Sifneos PE. Alexithymia: a view of the psychosomatic process. In: Hill OW, editor. *Modern trends psychosomatic medicine*. London: Butterworths, 1976. pp. 26–34.
- [6] Fitzgibbon ML, Stolley MR, Kirschenbaum DS. Obese people who seek treatment have different characteristics than those who do not seek treatment. *Health Psychol* 1993;12:342–5.
- [7] Ganley RM. Emotion and eating in obesity: a review of the literature. *Int J Eat Disord* 1989;8:343–61.
- [8] Abramson EE, Wunderlich RA. Anxiety, fear and eating: a test of the psychosomatic concept of obesity. *J Abnorm Psychol* 1972;79: 317–21.
- [9] Abramson EE, Stinson SG. Boredom and eating in obese and non-obese individuals. *Addict Behav* 1977;2:181–5.
- [10] Reznick H, Balch P. The effects of anxiety and response cost manipulations on the eating behavior of obese and normal-weight subjects. *Addict Behav* 1977;2:219–25.
- [11] Slochower JA. *Excessive eating The role of emotions and environment*. New York: Human Sciences Press, 1983.
- [12] Slochower J. Anxiety, perceived control and eating in obese and normal weight persons. *Appetite* 1980;1:75–83.
- [13] Slochower J, Kaplan SP, Mann L. The effects of life stress and weight on mood and eating. *Appetite* 1981;2:115–25.
- [14] Van Strien T. Ice-cream consumption, tendency toward overeating, and personality. *Int J Eat Disord* 2000;28:460–4.
- [15] Pinaquy S, Chabrol H, Simon C, Louvet JP, Barbe P. Emotional eating, alexithymia, and binge-eating disorder in obese women. *Obes Res* 2003;11:195–201.
- [16] Nolen-Hoeksema S. Gender differences in depression. *Curr Dir Psychol Sci* 2001;10:173–6.
- [17] Brebner J. Gender and emotions. *Pers Individ Differ* 2003;34:387–94.
- [18] King LA, Emmons RA. Conflict over emotional expression: psychological and physical correlates. *J Pers Soc Psychol* 1990; 58:864–77.
- [19] Mendes WB, Reis HT, Seery MD, Blascovich J. Cardiovascular correlates of emotional expression and suppression: do content and gender context matter? *J Pers Soc Psychol* 2003;84:771–92.

- [20] Stanton AL, Kirk SB, Cameron CL, Danoff Burg S. Coping through emotional approach: scale construction and validation. *J Pers Soc Psychol* 2000;78:1150–69.
- [21] Van Strien T. Nederlandse Vragenlijst voor Eetgedrag 2005. Handleiding en Verantwoording [Manual of the Dutch Eating Behavior Questionnaire 2005]. Amsterdam: Boom test uitgevers, 2005.
- [22] Loas G, Corcos M, Stephan P, Pellet J, Bizouard P, Venisse JL, et al. Factorial structure of the 20-item Toronto Alexithymia Scale Confirmatory factorial analyses in nonclinical and clinical samples. *J Psychosom Res* 2001;50:255–61.
- [23] Parker JDA, Taylor GJ, Bagby R. The 20-Item Toronto Alexithymia Scale: III Reliability and factorial validity in a community population. *J Psychosom Res* 2003;55:269–75.
- [24] Lane RD, Sechrest L, Riedel R. Sociodemographic correlates of alexithymia. *Compr Psychiatry* 1998;39:377–85.
- [25] Jyvaesjaervi S, Joukamaa M, Vaesaenen E, Larivaara P, Kivelae SL, Keinaenen Kiukaanniemi S. Alexithymia, hypochondriacal beliefs, and psychological distress among frequent attenders in primary health care. *Compr Psychiatry* 1999;40:292–8.
- [26] Van Strien T, Frijters JE, Bergers GPA, Defares PB. Handleiding bij de Nederlandse Vragenlijst voor Eetgedrag NVE [Manual of the Dutch Eating Behavior Questionnaire]. Lisse: Swets en Zeitlinger, 1986.
- [27] Wardle J. Eating style: a validation study of the Dutch Eating Behaviour Questionnaire in normal subjects and women with eating disorders. *J Psychosom Res* 1987;31:161–9.
- [28] Arrindell W, Ettema H, Groenman N, Brook F, Janssen I, Slaets J, et al. De groeiende inbedding van de Nederlandse SCL-90-R: psychodiagnostisch gereedschap [Further Dutch experiences with the Symptom Checklist-90 Revised]. *Psycholoog* 2003;38:576–82.
- [29] Derogatis LR, Melisaratos N. The brief symptom inventory: an introductory report. *Psychol Med* 1983;13:595–605.
- [30] Bagby R, Parker JDA, Taylor GJ. The twenty-item Toronto Alexithymia Scale: I Item selection and cross-validation of the factor structure. *J Psychosom Res* 1994;38:23–32.
- [31] Parker JDA, Bagby R, Taylor GJ, Endler NS, et al. Factorial validity of the 20-item Toronto Alexithymia Scale. *Eur J Pers* 1993;7:221–32.
- [32] Taylor GJ, Ryan D, Bagby R. Toward the development of a new self-report alexithymia scale. *Psychother Psychosom* 1986;44:191–9.
- [33] Taylor GJ, Bagby R, Parker JDA. The 20-Item Toronto Alexithymia Scale: IV Reliability and factorial validity in different languages and cultures. *J Psychosom Res* 2003;55:277–83.
- [34] Tabachnick BG, Fidell LS. Using multivariate statistics. Boston (MA): Allyn and Bacon; 2001.
- [35] Cohen J. Statistical power analysis for the behavioral sciences. 2nd ed. Hillsdale (NJ): Lawrence Erlbaum Associates, 1988.
- [36] Cohen J, Cohen P. Applied multiple regression/correlation analysis for the behavioural sciences. Hillsdale (NJ): Erlbaum, 1983.
- [37] Honkalampi K, Saarinen P, Hintikka J, Virtanen V, Viinamaeki H. Factors associated with alexithymia in patients suffering from depression. *Psychother Psychosom* 1999;68:270–5.
- [38] Honkalampi K, Hintikka J, Tanskanen A, Lehtonen J, Viinamaeki H. Depression is strongly associated with alexithymia in the general population. *J Psychosom Res* 2000;48:99–104.
- [39] Parker JD, Bagby R, Taylor GJ. Alexithymia and depression: distinct or overlapping constructs? *Compr Psychiatry* 1991;32:387–94.
- [40] Stunkard AJ, Faith MS, Allison KC. Depression and obesity. *Biol Psychiatry* 2003;54:330–7.
- [41] Kotler LA, Boudreau GS, Devlin MJ. Emerging psychotherapies for eating disorders. *J Psychiatr Pract* 2003;9:431–41.
- [42] Newhill CE, Mulvey EP. Emotional dysregulation: the key to a treatment approach for violent mentally ill individuals. *Clin Soc Work J* 2002;30:157–71.
- [43] Visscher TL, Kromhout D, Seidell JC. Long-term and recent time trends in the prevalence of obesity among Dutch men and women. *Int J Obes Relat Metab Disord* 2002;26:1218–24.
- [44] Larsen JK, Brand N, Bermond B, Hijman R. Cognitive and emotional characteristics of alexithymia: a review of neurobiological studies. *J Psychosom Res* 2003;54:533–41.
- [45] Lumley MA. Alexithymia, emotional disclosure, and health: a program of research. *J Pers* 2004;72:1271–300.