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The TAS-20 more likely measures negative affects rather than alexithymia itself in patients with major depression, panic disorder, eating disorders and substance use disorders

Carlo Marchesi[a,b,*], Paolo Ossola[a], Matteo Tonna[b], Chiara De Panfilis[a,b]

[a]Department of Neuroscience, Psychiatry Unit, University of Parma, Parma, Italy
[b]Mental Health Department, AUSL, Parma, Italy

Abstract

Background: This study evaluates whether the difference in Toronto Alexithymia Scale-20 item (TAS-20) between patients with major depression (MD), panic disorder (PD), eating disorders (ED), and substance use disorders (SUD) and healthy controls persisted after controlling for the severity of anxiety and depression.
Methods: Thirty-eight patients with MD, 58 with PD, 52 with ED, and 30 with SUD and 78 healthy controls (C) completed the TAS-20, the Hamilton Rating Scale for Anxiety (Ham-A), the Hamilton Rating Scale for Depression (Ham-D).
Results: The differences in TAS-20 scores observed between patient groups, regardless of the type of their disorders, and controls disappeared after controlling for the effect of anxiety and depression severity. In contrast, the differences in severity of anxiety and depression between patients and controls were still present, after excluding the effect of alexithymic levels.
Conclusions: Our data suggest that alexithymic levels, as measured by the TAS-20, are modulated by the severity of symptoms, supporting the view that alexithymia can represent a state phenomenon in patients with MD, PD, ED and SUD, because the TAS-20 seems overly sensitive to a general distress syndrome, and it is more likely to measure negative affects rather than alexithymia itself.

1. Introduction

Alexithymia is a multidimensional construct characterized by an impoverished fantasy life, difficulty in expressing or naming feelings, difficulty distinguishing between bodily sensations and feelings, and a preoccupation with external events [1]. The TAS-20 is the most widely used and studied self-report measure of alexithymia. Factor analysis has supported three-factor solutions for this scale: the factors represent (1) difficulty identifying feelings (DIF), (2) difficulty communicating and describing feelings (DDF), and (3) external-oriented thinking (EOT). Items representing impoverished fantasy or reduced daydreaming were dropped from the TAS-20 based on the factor analyses solutions.

Alexithymia, reflecting a disordered affect regulation, is thought to increase vulnerability to psychological illness, especially in conflict-afflicted psychosocial situations. Therefore, people with alexithymic personality are supposed to be at risk for developing mental disorders such as major depression [1], panic disorder [2], eating disorders [3] and substance use disorders [4].

Concerning major depression (MD) the rate of alexithymia ranges between 45% and 46% during the acute phase of illness [5–11]. A similar rate of alexithymia (29%–44%) was found in the active phase of panic disorder (PD) [2,12], and even higher rates (23%–77%) were observed in patients with eating disorders (ED) (anorexia nervosa, bulimia nervosa and binge eating disorder) [13–16] and in patients with substance use disorders (SUD) (i.e., between 45% and 67% of patients with alcohol use disorders) [17].

However, the evaluation of alexithymia with the TAS-20 can be limited by the fact that alexithymia cannot be validly

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* Corresponding author at: Department of Neuroscience, Psychiatry Unit, General Hospital, Università di Parma, Braga Building, Via Gramsci 14, 43100 Parma, Italy. Tel.: +39 0521 903597 98; fax: +39 0521 396825.
E-mail address: carlo.marchesi@unipr.it (C. Marchesi).

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assessed by a self-report instrument because people with alexithymia, by definition, should not be able to report their psychological state.

Further, when alexithymia was assessed with the TAS-20, significant relationships have been found with depression and anxiety not only in the general population [18,19], but also in clinical samples. In the general population, depressive symptoms explained almost 36% of the variance in alexithymic features [18] or were significantly correlated with all alexithymic dimensions (DIF: $r = 0.52$; DDF: $r = 0.42$; EOT: $r = 0.20$) [19].

In clinical samples, some studies observed a decrease in the TAS-20 scores when depressive symptoms improved in MD [5–11,20] or when anxiety symptoms decreased in PD [2]. Moreover, an overlap between TAS-20 (particularly the DIF dimension) and anxiety was found in a factor analysis study in patients with anxiety or depressive disorders [25], and an association between alexithymia and severity of depression and anxiety was also found in SUD [21–24] and in ED [3,14].

Altogether the aforementioned findings raise the question whether the TAS-20 measures negative affects rather than alexithymia itself in mental disorder. Hoffart [26] and Lumley [27] suggest a method to answer this question: if the TAS-20 identifies alexithymic traits the differences between patients and healthy controls should persist after controlling for anxiety and depression. To our knowledge, however, no study investigating alexithymia in mental disorders with the TAS-20 applied this method.

Therefore the present study aimed to clarify whether the differences in TAS-20 scores among patients with MD, PD, ED and SUD and healthy controls remained after controlling for the effect of the severity of anxious and depressive symptoms.

2. Materials and methods

2.1. Sample

Patients were recruited from all patients who consecutively sought treatment at the outpatient service of the Psychiatry Clinic of the University of Parma-Italy from January to December 2011, after receiving a diagnosis of MD, PD, ED or SUD. The local ethics committee approved the study protocol and the study was conducted according to the Helsinki Declaration. All patients provided informed consent.

Exclusion criteria for study participation were the presence of schizophrenia or other psychotic disorders, organic mental disorders, severe suicidal risk, a history of neurological or medical disorder, a BMI lower than 16 for ED patients and abstinence from substances for less than 2 months for SUD subjects.

The control group comprised age- and sex-matched healthy subjects, recruited from university and hospital employers.

2.2. Assessment

After giving informed consent, all subjects were administered the Structured Clinical Interview for DSM-IV Disorders [28], the Hamilton Rating Scale for Anxiety (Ham-A) [29] and for Depression (Ham-D) [30], the 20 item-Toronto Alexithymia Scale (TAS-20) [31] and a semi-structured interview assessing clinical and anamnestic information.

A resident in psychiatry (P.O.) was specifically trained to administer the SCID. The training consisted in the administration of the SCID to 10 patients affected by major depression, dysthymia, panic disorder, generalized anxiety disorder, anorexia nervosa, bulimia nervosa, binge eating disorder, cocaine or heroin dependence. The interviews were audiotaped and reviewed by a senior psychiatrist (C.M.). A satisfactory diagnostic reliability ($k = 0.79$) was obtained during the training.

2.3. Statistical analysis

The internal consistency for the TAS-20 was calculated in each diagnostic group. The Cronbach α was .78 in the MD group, .87 in the PD group, .83 in the ED group, .81 in the UD group and .80 in the control group. The values obtained in each group demonstrated that patients were able to understand the questions and to respond to the items in an appropriate and consistent way. Differences among the diagnostic groups were evaluated using χ^2 for categorical variables and one-way ANOVA with Bonferroni post hoc analysis for continuous variables, as appropriate.

We used Pearson correlation to evaluate how alexithymia was related to age and education.

We used analysis of covariance (ANCOVA) to evaluate the between-groups differences on TAS-20 scores after adjusting for age and education, which were found to be significantly different among diagnostic groups. Moreover, we then used analysis of covariance (ANCOVA) to evaluate the between-groups differences on the following: (1) TAS-20 scores, after controlling for age, gender, education and severity of anxious and depressive symptoms (Ham-A and Ham-D scores), and (2) Ham-A and Ham-D scores, after controlling for the effect TAS-20 total, DIF, DDF, and EOT scores.

Finally, linear regression analysis was used to evaluate the relationship between TAS-20 total, DIF, DDF and EOT scores (dependent variables) and age, gender (0 = male; 1 = female), years of education, Ham-A and Ham-D scores (independent variables) in the whole sample, in order to establish whether alexithymia levels were associated with the severity of concurrent anxious and depressive symptoms.

3. Results

3.1. Sample

A total of 178 patients and 78 healthy controls (C) participated in this study. Within the clinical group, 38 patients were affected by MD, 58 by PD, 52 by ED (anorexia

nervosa $n = 20$; bulimia nervosa $n = 20$; binge eating disorder $n = 14$) and 30 by SUD (cocaine dependence $n = 10$; heroin dependence $n = 11$; multiple substances dependence $n = 9$). Table 1 shows the socio-demographic features of both the patient and the control groups.

3.2. TAS-20 scores

TAS-20 total score was higher in MD, PD and ED patients than in C, while the difference between SUD and C did not reach statistical significance (Table 2). Patients with MD showed the highest levels in all three subscales of TAS-20, whereas ED reported higher scores than C only for DIF and DDF, PD only for DIF dimension, and SUD only for DDF dimension. All these differences persisted after controlling for age and education (ANCOVA, TAS-20 total score: $F = 16.8$; $p < .001$; DIF: $F = 22.4$; $p < .001$; DDF: $F = 7.6$; $p < .001$; EOT: $F = 5.5$; $p < .001$), which significantly differed among diagnostic groups, although only age correlated with the TAS-20 scores ($b = .14$; $p = .02$). Among groups, all the above-mentioned differences in TAS-20 scores disappeared after controlling for the effect of severity of anxious and depressive symptoms (Table 2).

3.3. Severity of anxious symptoms

Ham-A scores were significantly higher in patients than in C. Among patients, the most anxious were those with MD and the lowest those with SUD, with PD and ED lying in the middle position (Table 2). The significant differences among groups were still present after controlling for the effect of age, gender, years of education DIF, DDF, and EOT scores (Table 2).

3.4. Severity of depressive symptoms

The Ham-D scores were significantly higher in MD patients than in PD, ED, SUD patients or in C. Moreover, PD, ED, SD patients were more depressed than C (Table 2). The significant differences among groups were still present after controlling for the effect of age, gender, years of education, DIF DDF, and EOT TAS-20 scores (Table 2).

3.5. Relationship between TAS-20 scores and anxiety or depression

In the total sample, linear regression analyses showed that TAS-20 scores were predicted by Ham-A scores ($\beta = .28$; $t = 3.0$; $p = .002$) and Ham-D scores ($\beta = .23$; $t = 2.5$; $p = .01$); DIF scores were predicted by Ham-A scores ($\beta = .47$; $t = 5.3$; $p < .001$) and by female gender ($\beta = .15$; $t = 2.7$; $p = .006$); DDF and EOT scores were both predicted by Ham-D scores ($\beta = .23$; $t = 2.2$; $p = .02$; and $\beta = .21$; $t = 2.1$; $p = .03$, respectively) and age ($\beta = .17$; $t = 2.7$; $p = .007$).

4. Discussion

This study evaluated whether patients with psychiatric disorders (MD, PD, ED, SUD) show higher TAS-20 scores than healthy controls even when controlling for the potential confounding effect of anxious and depressive symptoms.

The results indicate that all patient groups, regardless of their specific disorder, reported higher TAS-20 scores than healthy C, although the difference between SUD patients and C did not reach a statistical significance.

This finding confirms the results of previous studies that assessed alexithymia with the TAS-20 in MD [5–11,32], PD [2,12], ED [13–16] and SUD [17,23,24]. However, the differences on TAS-20 total score observed among the diagnostic groups disappeared after controlling for the effect of anxious and depressive symptoms. This finding suggests that the severity of anxious and depressive symptomatology could account for the increased TAS-20 scores observed in patients with different mental disorders: when the differences in symptoms severity were controlled for, all patient groups,

Table 1
Socio-demographic and psychopathological characteristics of patients with major depression (MD), panic disorder (PD), eating disorder (ED), and substance dependence (SD) and healthy controls (C).

	MD ($n = 38$)	PD ($n = 58$)	ED ($n = 52$)	SD ($n = 30$)	C ($n = 78$)	
Gender (female), *n* (%)	19 (50.0)	40 (69.0)	48 (92.3)	6 (20.0)	63 (80.8)	$\chi^2 = 58.0$; $p < .001$
Age (years)	51.3 ± 11.7	36.3 ± 10.7	43.5 ± 12.5	33.2 ± 9.6	41.2 ± 11.8	$F = 14.0$; $p < .001$
Education (years)	9.9 ± 4.4	10.3 ± 3.5	10.3 ± 3.5	8.7 ± 3.0	8.4 ± 3.6	$F = 3.6$; $p = .007$
Family status, *n* (%)						$\chi^2 = 58.5$; $p < .001$
Never married	9 (23.7)	19 (32.8)	12 (23.1)	27 (90.0)	22 (28.2)	
Married	20 (52.6)	30 (51.7)	34 (65.4)	2 (6.7)	48 (61.5)	
Separated/divorced	8 (21.1)	7 (12.1)	4 (7.7)	1 (3.3)	3 (3.8)	
Widowed	1 (2.6)	2 (3.4)	2 (3.8)	–	5 (6.4)	
Occupation, *n* (%)						$\chi^2 = 64.1$; $p < .001$
Unemployed	5 (13.2)	5 (8.6)	4 (7.7)	13 (43.3)	5 (6.4)	
Student	–	9 (15.5)	3 (5.8)	1 (3.3)	7 (9.0)	
Housewife	7 (18.4)	6 (10.3)	3 (5.8)	1 (3.3)	18 (23.1)	
Employed	19 (50.0)	38 (65.5)	38 (73.1)	15 (50.0)	43 (55.1)	
Retired	7 (18.4)	–	4 (7.7)	–	5 (6.4)	
Alexithymia, *n* (%)						
TAS-20 score >60	17 (44.7)	16 (27.6)	17 (32.7)	5 (16.7)	4 (5.1)	$\chi^2 = 28.2$; $p < .001$

Table 2
Severity of depressive–anxious symptoms and levels of alexithymia in patients with major depression (MD, panic disorder (PD), eating disorders (ED), substance use disorders (SUD and in healthy controls (C).

	MD (n = 38)	PD (n = 58)	ED (n = 52)	SUD (n = 30)	C (n = 78)	One-way ANOVA (df = 4,251)
Ham-A	25.1 ± 8.1	20.1 ± 7.0	16.5 ± 4.7	11.3 ± 5.1	1.9 ± 2.3	F = 153.9; p < .001[a]
Ham-D	24.7 ± 6.6	13.7 ± 6.1	11.5 ± 4.7	13.1 ± 5.2	1.9 ± 2.0	F = 147.7; p < .001[b]
TAS-20						
DIF	21.5 ± 7.2	20.9 ± 6.4	20.2 ± 6.7	16.1 ± 6.2	13.0 ± 4.8	F = 21.6; p < .001[c]
DDF	16.0 ± 4.8	12.6 ± 4.4	13.7 ± 5.5	14.3 ± 4.0	11.0 ± 4.6	F = 7.9; p < .001[d]
EOT	21.3 ± 3.0	18.7 ± 6.3	18.7 ± 6.3	17.7 ± 4.4	16.0 ± 5.9	F = 5.9; p < .001[e]
Total	58.9 ± 12.1	52.2 ± 14.4	53.0 ± 14.4	47.4 ± 11.4	40.1 ± 11.5	F = 16.9; p < .001[f]
Means adjusted for the effects of covariates						ANCOVA (df = 10,256)
	Covariates: age, gender, education, DIF, DCF and EOT scores					
Ham-A	24.7 ± 5.5	19.2 ± 5.3	15.7 ± 5.0	11.9 ± 5.4	3.0 ± 5.2	F = 88.4; p < .001[a]
Ham-D	23.8 ± 4.9	13.4 ± 4.5	11.0 ± 4.3	13.9 ± 4.9	2.6 ± 5.2	F = 90.6; p < .001[b]
	Covariates: age, gender, education, Ham-A and Ham-D scores					ANCOVA (df = 9,256)
TAS-20						
DIF	17.8 ± 9.2	19.2 ± 6.0	19.2 ± 5.7	17.1 ± 6.5	16.3 ± 9.7	F = 1.4; p = .21
DDF	14.9 ± 7.3	12.0 ± 5.3	13.5 ± 5.0	14.1 ± 5.4	12.1 ± 7.9	F = 1.9; p = .10
EOT	18.5 ± 8.6	19.0 ± 6.9	19.0 ± 5.7	17.1 ± 6.0	17.3 ± 8.8	F = 0.6; p = .60
Total	51.3 ± 19.7	50.2 ± 14.4	52.1 ± 12.9	47.8 ± 14.2	45.7 ± 21.1	F = 1.0; p = .38

DIF, difficulty identifying feelings; DDF, difficulty communicating and describing feelings; EOT, external oriented thinking.
Bonferroni post hoc analysis.
[a] D > PD > ED > SD > C.
[b] D > PD, ED, SD > C.
[c] D, PD, ED > SD, C.
[d] D > PD, C; ED, SD > C.
[e] D > C.
[f] D > SD, C; PD, ED > C.

regardless of their disorder, showed TAS-20 total scores comparable to those reported by healthy controls.

At the same time, our results do not support the notion that TAS-20 scores increase the risk for anxiety and depression as suggested by some authors [33,34]. In order to test this hypothesis, we also evaluated whether the observed difference between patients and controls in anxious and depressive psychopathology disappeared after controlling for the effect of TAS-20 scores. Results showed that this was not the case in our sample, suggesting that TAS-20 levels do not influence the severity of anxious and depressive symptoms.

Furthermore, the patient groups scored differently on the three alexithymic dimensions.

Specifically, MD patients reported higher DIF, DDF and EOT than controls, whereas ED patients showed an increase only in DIF and DDF. PD patients were higher than controls only on DIF, and SUD only on DDF. However, all these observed differences among groups disappeared after excluding the effect of symptoms severity, suggesting that psychopathology severity was responsible for the increased levels of the alexithymic dimensions. Thus, the different patterns of alexithymia reported by diverse diagnostic groups could be explained by the different effects of anxious and depressive symptoms on the three alexithymic dimensions. In fact, in this study the severity of anxiety directly predicted DIF scores (β = .47; p < .001), whereas the severity of depression predicted DDF (β = .21; p = .03) and EOT scores. Accordingly, the highest DIF, DDF, EOT scores were found in MD patients, who also reported the highest severity of anxious and depressive symptoms, while PD patients, who were more anxious than depressed, were higher than controls only on the DIF dimension, and SUD patients, who were more depressed than anxious, were higher than controls only with respect to DDF scores. Taken together, these findings support the hypothesis of a specific relationship between some anxiety and depressive symptoms and definite alexithymic dimensions. Indeed, previous studies [23,35,36] reported an association between psychic anxiety and DIF dimension. Further, DDF elevation has been associated with suicide ideation in depressed patients [37] as well as with depersonalization/derealization in PD patients [30] whereas the EOT dimension has been positively related to psychomotor retardation in major depressed patients [38].

The results of this study have the potential to contribute to the ongoing and long-lasting debate concerning the stability of alexithymia among mental disorders. Several influential authors [1,9,11,39] suggest that alexithymia is a personality trait that, as such, is characterized by a relative stability: while alexithymic levels can increase and decrease depending on

the fluctuation of illness symptoms, the relative differences among individuals remain stable over time. This hypothesis implies that the basic personality conditions, which constitute a liability toward a mental disorder, are accentuated by the state of illness and return to the pre-existing conditions after remission, as suggested by Hoffart [26]. According to this trait–state hypothesis [26] a basic personality condition constitutes a predispositional factor to the disorder whether "the observed personality differences between diagnostic groups will persist after symptom severity has been controlled for." With respect to alexithymia, this means that if alexithymia was a personality trait in a mental disorder the difference in TAS-20 scores observed between patients and healthy controls should still hold true after excluding the effect of illness symptoms. For instance, Lumley [27] suggested to test the uniqueness of the TAS in the relationship with depression by statistically controlling the other construct and examining the residual relationship of the TAS with the criterion. In the present study, the differences in TAS-20 scores among patients and between patients and healthy controls disappeared, after controlling for the effect of the severity of anxious and depressive symptoms. Therefore, our findings do not support the hypothesis that alexithymia behaves as a stable personality trait among patients with psychiatric disorders; on the contrary, these data indicate that alexithymia, as assessed by the TAS-20, is a state phenomenon, because its levels appear to be modulated by the severity of symptoms (and not vice versa). This confirms our previous findings that among women who developed MD [20] or PD [40] alexithymia levels were in the normal range prior to illness onset, but increased steadily during the acute phase of the disorder.

There are at least two alternative explanations for the observed relationship between alexithymia and anxiety and depression. Alexithymia may be a temporary response to stress represented by an illness episode; in this view "secondary alexithymia" can represent a defense or a strategy to cope with distress (emotional pain, aversive memories and physiological arousal) associated with a mental disorder [25]. In the second view, the relationship between alexithymia and depression may represent an artifact of the method and measures used [27], since, particularly, the TAS-20 dimensions DIF and DDF are associated with different measures of negative affects [2,3,14,16,18,20,25,27,39,41–45]. Therefore individuals with negative emotional states (i.e. anxiety and depression) might score high on these TAS-20 dimensions.

The present study supports this latter view, since also in mental disorders such as ED and SUD, which are frequently associated with anxiety and depression, the higher levels of TAS-20 scores disappeared when the effect of anxiety and depression was excluded. This should have not occurred if alexithymia was a personality trait predisposing people to ED or SUD, as hypothesized by previous studies [46–48].

Thus, our study confirms the shortcomings with respect to validity and reliability of TAS-20 in the assessment of alexithymia in clinical samples [49,50]: alexithymia, as assessed by the TAS-20, can be more a measure of negative affect rather than a measure of deficit in the cognitive processing of emotions across different mental disorders. This seems particularly true for the DIF and DDF dimensions, since DIF capture anxiety symptoms and DDF is sensible to depressive symptoms. According to this view, the proposed existence of an alexithymic depression [51], characterized by high DIF and DDF levels, may be questioned, since in the study of Vanheule et al. [51], even though the alexithymic patients showed the most severe depressive symptoms, the TAS-20 differences between strongly and moderately alexithymic patients were not adjusted the for the severity of anxious and depressive symptoms. Similarly, also the conclusion of a recent study can be questioned [52]. In the study of Leweke et al. [52], the increased prevalence of alexithymic subjects in mental disorders, especially in depressive disorders, let the authors to conclude that alexithymia may be associated with a higher vulnerability to mental illness, even though they did not control if the high prevalence of alexithimic subject persisted in mental disorders after adjusting for the severity of anxious and depressive symptoms. Therefore, no conclusion about the causal relationship between alexithymia and mental disorders can be drawn from these two studies [51,52], since the effect of negative affects on the TAS-20 scores was not controlled for.

5. Conclusion

The present study supports the hypothesis that the TAS-20, the most widely used self-administered scale assessing alexithymia, is overly sensitive to a general distress syndrome, and therefore it is more likely to measure negative affects (distress, nervousness, fear, anger, guilt, sadness, scornfulness) rather than alexithymia itself. Future studies investigating alexithymia among psychiatric populations should control for the severity of anxiety and depression before arguing that alexithymia is a personality trait predisposing to mental disorders. Finally, the findings of the present study, based only on a self-reported measure of alexithymia, need to be confirmed using observer ratings (e.g., Toronto Structured Interview for Alexithymia) or objective performance-based tasks such as the Levels of Emotional Awareness Scale.

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