

## Aticoli originali

# The relationship between alexithymia, defense mechanisms, eating disorders, anxiety and depression

## *La relazione tra alestitimia, meccanismi di difesa, disturbi del comportamento alimentare, ansia e depressione*

VITTORIO LENZO<sup>1</sup>\*, NADIA BARBERIS<sup>2</sup>, MARCO CANNAVÒ<sup>2</sup>, ANTONELLA FILASTRO<sup>3</sup>,  
VALERIA VERRASTRO<sup>4</sup>, MARIA CATENA QUATTROPANI<sup>2</sup>

\*E-mail: vittorio.lenzo@unicas.it

<sup>1</sup>Department of Human, Social and Health Sciences University of Cassino and South Latium, Cassino, Italy

<sup>2</sup>Department of Clinical and Experimental Medicine, University of Messina, Messina, Italy

<sup>3</sup>IPUE - Istituto di Psicologia Umanistica Esistenziale "Luigi De Marchi", Rome, Italy

<sup>4</sup>Department of Surgical and Medical Sciences, "Magna Graecia" University of Catanzaro, Italy

**SUMMARY. Introduction.** Research suggests that alexithymia is a significant element for emotion processing, while defense mechanisms proved to be important factors for adjusting to stressful life events and to cope with potential psychopathologies. **Aims.** The aims of the present study are to examine the relationships between alexithymia, defense mechanisms, depression, anxiety and eating disorders and to examine the mediation role of defense mechanisms in the relation between alexithymia and anxiety, depression and eating disorders. **Material.** In a sample of 283 subjects, aged 18-49 (M=2.33, DS=4.81), instruments were administered to measure alexithymia, defense mechanisms, depression, anxiety and eating disorders. **Results.** This study showed that alexithymia was positively related to anxiety, depression, general psychological maladjustment, eating disorder risk, maladaptive style defense mechanisms, image-distorting style defense mechanisms, self-sacrificing style defense mechanisms, whereas it was negatively related to Mature Style Defense Mechanisms. Implications of the findings are discussed.

**KEY WORD:** alexithymia, defense mechanism, anxiety, depression, eating disorders.

**RIASSUNTO. Introduzione.** Numerose ricerche hanno evidenziato che l'alestitimia è un elemento significativo per l'elaborazione delle emozioni, mentre i meccanismi di difesa si sono rivelati fattori importanti per adattarsi a eventi di vita stressanti e per far fronte a potenziali psicopatologie. **Scopo.** Lo scopo di questo studio è di indagare le relazioni tra alestitimia, meccanismi di difesa, depressione, ansia e disturbi del comportamento alimentare. Un altro scopo di questo lavoro è di indagare il ruolo di mediatore dei meccanismi di difesa nella relazione tra alestitimia, ansia, depressione e disturbi del comportamento alimentare. **Materiali.** Un campione di 283 soggetti, con un'età compresa tra i 18 e i 49 anni (M=2,33, DS=4,81), ha preso parte a questa ricerca. Sono stati impiegati degli strumenti per misurare l'alestitimia, i meccanismi di difesa, la depressione, l'ansia e i disturbi del comportamento alimentare. **Risultati.** Lo studio ha mostrato che l'alestitimia è correlata positivamente con ansia, depressione, disadattamento psicologico generale, rischio di disturbi del comportamento alimentare, stile difensivo disadattivo, stile difensivo di distorsione dell'immagine, stile difensivo di auto-sacrificio. L'alestitimia è inoltre correlata negativamente con lo stile difensivo maturo. Le implicazioni di questi risultati sono discusse.

**PAROLE CHIAVE:** alestitimia, meccanismi di difesa, ansia, depressione, disturbi del comportamento alimentare.

## INTRODUCTION

Alexithymia is described as a disorder of affect regulation and is characterized by difficulty in identifying and verbalizing emotions, paucity of imagination, externally oriented cognitive style, and emotional deregulation<sup>1</sup>. People with alexithymia show difficulties in distinguishing and describing emotions, a paucity of humour and imagination and concrete cognitive style<sup>2</sup>.

Furthermore, alexithymia is described as a difficulty in

distinguishing among emotions and experiencing them consciously<sup>3</sup>. Alexithymia is generally associated with health problems such as heart diseases<sup>4</sup>, but is also present in healthy people<sup>5</sup>. Several studies showed that alexithymia is a transdiagnostic factor for many psychopathologies<sup>6</sup>, it is a negative factor of outcome for psychotherapy<sup>7</sup> and for the creation of the therapeutic alliance<sup>8</sup>. Furthermore, previous studies<sup>9</sup> have implicated both environmental and developmental factors, in particular parenting style, in the aetiology of alexithymia<sup>10</sup>.

*The relationship between alexithymia, defense mechanisms, eating disorders, anxiety and depression*

Several findings showed a significative association with depression and anxiety<sup>11,12</sup> and eating disorders (EDs)<sup>13,14</sup>.

Several studies showed that alexithymia positively correlates with maladaptive defense styles<sup>15,16</sup>. Defense mechanisms are an unconscious function of the ego used in order to protect oneself from anxiety<sup>17</sup>. Defense mechanisms can be conceptualized on a continuum that ranges from mature to immature. Individual defenses that are conceptually and adaptively similar are typically clustered together into higher-order defense levels<sup>18</sup>. Research showed support for this theory<sup>19</sup>. Previous studies<sup>20</sup> has investigated both environmental and developmental factors implicated in defense mechanisms development. Porcerelli et al.<sup>20</sup> highlighted that the less frequent use of maladaptive defenses by mothers predicted greater attachment security, better social-emotional competence, and fewer behavior problems in children. Maternal ability to use adaptive defense mechanisms during stressful times allows her to support the child's psychological development and regulatory capacities<sup>20</sup>.

Moreover, Boerner et al.<sup>21</sup> suggested that the level of a mature defense style moderated the association between self-reported trauma experiences and both negative and positive affectivity.

Individuals with more functional defense mechanisms are able to cope with problems successfully, consequently their level of distress is reduced<sup>22</sup>. Previous findings show that personality traits predict individual defense mechanisms<sup>23</sup> and previous researches have shown how personality aspects play an increasingly prominent role in the relationship with defense mechanisms<sup>24</sup>. For instance, neuroticism has been shown to be a relevant factor in the prediction of the usage of dysfunctional defense mechanisms as a way to cope with stress<sup>23</sup>.

Consistent findings have shown that an excessive use of immature defenses is related to both less favourable personality characteristics and affective disorders<sup>25</sup>. Moreover, immature defensive patterns are consistently related to alexithymia<sup>26</sup>. Defense mechanisms have been considered by clinical studies since they have special importance in clinical populations<sup>27</sup>. Some authors hypothesize that alexithymia represents a primitive mental defense, and that the deficit in processing emotional information subcomponent can be seen as a way of minimizing emotional involvement, in order to protect the self<sup>28</sup>.

Defense mechanisms intervene in our way of perceiving reality and coping with problems, and for this reason they have a seminal role in EDs<sup>29</sup> and in both depression and anxiety<sup>30,31</sup>.

EDs are characterized by various eating-related problems such as dietary restriction, purging and binge eating that cause severe distress or apprehension about weight and shape<sup>32</sup>. Depression is characterized by a loss of interest in previously pleasurable activities, sadness, irritability, feelings of worthlessness, hopelessness, guilt, concerns over death, or suicidal ideation, sleep disturbances, decreased energy, indecisiveness, or distracted attention<sup>33</sup>, whereas anxiety is characterized by feelings of worry about something with an uncertain outcome that may cause physical symptoms, such as fast heart rate<sup>32</sup>.

Several studies consistently found that, compared to healthy controls, individuals with an EDs used more maladaptive defensive functioning styles<sup>34,35</sup>.

Tordjman et al.<sup>36</sup> showed differences in psychological functioning between patients and healthy subjects regarding projection, suppression and sublimation in particular.

Vidovic et al.<sup>37</sup> showed that people with anorexia with purging behaviour and bulimia scored higher levels of maladaptive defenses compared to people with anorexia with restrictive behaviour and healthy people.

Furthermore, previous findings showed that the symptoms of depression and anxiety positively relate with immature defense mechanisms, while did not relate with mature defense mechanisms in psychiatric population<sup>31</sup>, and general population<sup>38</sup>.

Furthermore, previous findings showed that depressive disorder uses an higher level of immature defenses compared to anxiety<sup>39</sup>.

Since several findings have shown how emotional aspects play an increasingly relevant role in EDs, depression, Anxiety and general psychopathology<sup>40-43</sup>, and how defense mechanisms predict adjustment<sup>43</sup>, it seems reasonable to study these two aspects concurrently in the relationship with EDs, anxiety and depression.

The aims of this study are 1) to examine the relationships between the dimensions of alexithymia, defense mechanisms, EDs, depression and anxiety 2) to examine the mediation role of defense mechanisms in the relation between alexithymia, depression and Anxiety.

## MATERIALS AND METHODS

### Participants

A convenience sample took part in this study on a voluntary basis, without any form of compensation. The sample consisted of 283 subjects, aged 18-49 (M=2.33, DS=4.81). All participants were Italian. Regarding educational level, 77% had a high school diploma, 9% had a degree, while 14% did not report this information. Regarding occupational level, 2% had a dependent employment, 1% had independent employment, 77% were students, 7% were unemployed, 1% were retired, 2% were housewives, 17% did not report this information. Regarding marital status, 44% of the sample was unmarried, 5% was married, 2% was cohabitant, 2% was divorced, 49% was engaged.

### Measures

#### *Defense mechanisms*

Defense Style Questionnaire<sup>43,44</sup> is a 88 item self-report instrument which measures conscious manifestations of defense mechanisms. Participants are required to rate, on a 9-point scale, their level of agreement with each item. It can be divided in four domains, Immature (e.g. "I often act impulsively when something is bothering me."), Mature (e.g. "I get satisfaction from helping others and if this were taken away from me I would get depressed"), Image-distorting (e.g. "I am superior to most people I know.") and Neurotic (e.g. "If someone mugged me and stole my money, I'd rather he'd be helped than punished.").

The Defense Style Questionnaire has been widely used and past research has shown good psychometric characteristics<sup>44-46</sup>.

### Alexithymia

Toronto Alexithymia Scale<sup>47,48</sup> is a 20 item self-report instrument which measures personal level of alexithymia. The TAS-20 consists of the three subscales, difficulty identifying feelings (DIF) (e.g. "I am often confused about what emotion I am feeling"), difficulty describing feelings (DDF) (e.g. "It is difficult for me to find the right words for my feelings") and externally oriented thinking (EOT) (e.g. "I prefer to just let things happen rather than to understand why they turned out that way"). Participants are required to rate, on a 5-point scale, their level of agreement with each item.

Past research has shown good psychometric characteristics<sup>12,47,48</sup>.

### Depression

Beck Depression Inventory II<sup>49,50</sup> is a 21 item self-report instrument which measures personal level of depression (e.g. "I can't get any pleasure from the things I used to enjoy"). The measure focuses on depressive symptoms that have occurred over the preceding two weeks. Participants are required to rate, on a 4-point scale, their level of agreement with each item. Past research has shown good psychometric properties<sup>50-54</sup>.

### Anxiety

Beck Anxiety Inventory<sup>54,55</sup> is a 21 item self-report instrument which measures personal level of anxiety. The questions used in this measure ask about several common symptoms of anxiety that the participant has had during the past week (e.g. "Difficulty in breathing"). Participants are required to rate, on a 4-point scale, their level of agreement with each item. Past research has shown good psychometric properties<sup>53,56</sup>.

### Eating disorders

The Eating Disorder Inventory-3<sup>57,58</sup> is a 91 item self-report questionnaire used to assess the presence of EDs. The EDI-3 consists of subscales low self-esteem (LSE), personal alienation (PA), interpersonal insecurity (II), interpersonal alienation (IA), interoceptive deficits (ID), emotional dysregulation (ED), perfectionism (P), asceticism (AS) and maturity fear (MF). The Eating Disorder Risk (EDR) scale comprises three of the subscales and describes a global measure of eating concerns and control over both food and body (e.g. "I eat sweets and carbohydrates without being nervous"), and the General Psychological Maladjustment (GPM) scale comprises the remaining nine subscales, and describes psychological – related maladjustment related to EDs behaviors (e.g. "I feel extremely guilty after eating too much."). Participants are required to rate, on a 6-point scale, their level of agreement with each item. For the purpose of this study, the latter two subscales have been used. EDI – 3 was widely used in several studies<sup>59,60</sup>. Past research has shown good psychometric properties<sup>61</sup>.

### Procedures

The subjects were recruited from among friends and acquaintances of psychology students. After describing the study's pur-

pose, participants signed the informed consent to participate in the study. Privacy and the anonymity of their answers were guaranteed. Administration took place in a calm and peaceful environment in the presence of a properly trained psychologist. The protocol described above took about 30 min to be completed. The data were then analyzed using IBM SPSS-22 and EQS 6.2.

## RESULTS

Table 1 shows Means, Standard Deviations (SD) and the correlations among the dimensions of the questionnaires. DIF correlated with depression, anxiety, maladaptive style (MS), image-distorting style (IS), self-sacrificing style (SS), GPM and EDR. DDF correlated with depression, anxiety, MS, IS, and GPM. External-oriented thinking (EOT) negatively correlated with adaptive style (AS). Depression correlated with anxiety, MS, IS, SS, GPM and EDR. Similarly anxiety correlated with MS, IS, SS, GPM and EDR. MS correlated with GPM and EDR. IS and SS correlated with GPM.

In our study, we used Structural Equation Modeling (SEM) to examine the relationship of variables. In this model DDF and EOT are the predictor variables, MS, IS, SS and AS are variable mediation, depression, anxiety, GPM and EDR are the outcomes.

Analysis of the covariance matrices was conducted using EQS 6.2 and solutions were generated based on maximum-likelihood estimation.

Estimation of the saturated model, and therefore no fit indices were reported, showed a significant path from DIF to MS ( $b=.46$ ;  $p<.05$ ), SS ( $b=.21$ ;  $p<.01$ ), depression ( $b=.24$ ;  $p<.05$ ), anxiety ( $b=.33$ ;  $p<.05$ ), and GPM ( $b=.30$ ;  $p<.05$ ). DDF was related with IS ( $b=.15$ ;  $p<.05$ ). Furthermore EOT was related with AS ( $b=-.17$ ;  $p<.05$ ), and anxiety ( $b=-.14$ ;  $p<.05$ ). Moreover MS was predicted depression ( $b=.45$ ;  $p<.05$ ), anxiety ( $b=.39$ ;  $p<.05$ ), GPM ( $b=.52$ ;  $p<.05$ ) and EDR ( $b=.38$ ;  $p<.05$ ). AS was predicted depression ( $b=-.17$ ;  $p<.05$ ), anxiety ( $b=-.15$ ;  $p<.05$ ) and GPM ( $b=-.12$ ;  $p<.05$ ).

In according with common procedure to test the saturated model<sup>62</sup> all nonsignificant paths were removed and several indices indicated that the data fit the final model (Figure 1),  $\chi^2(24)=32.55$ ;  $p=.11$ , CFI =.99, RMSEA=.04 (90% CI=.00-.06). The results showed a significant path from DIF to MS ( $\beta=.46$ ;  $p<.05$ ), SS ( $\beta=.16$ ;  $p<.05$ ), GPM ( $\beta=.32$ ;  $p<.05$ ), depression ( $\beta=.26$ ;  $p<.05$ ) and anxiety ( $\beta=.30$ ;  $p<.05$ ). DDF was related to IS ( $\beta=.18$ ;  $p<.05$ ), while EOT was related with AS ( $\beta=-.18$ ;  $p<.05$ ) and anxiety ( $\beta=-.14$ ;  $p<.05$ ). Moreover there were a significant path from MS ( $\beta=.34$ ;  $p<.05$ ) and AS ( $\beta=-.12$ ;  $p<.05$ ), to anxiety, and from MS ( $\beta=.44$ ;  $p<.05$ ), and AS ( $\beta=-.13$ ;  $p<.05$ ) to depression. Furthermore there were a significant path from MS ( $\beta=.49$ ;  $p<.05$ ), and AS ( $\beta=-.11$ ;  $p<.05$ ) to GPM. Moreover there was a significant path from MS to EDR ( $\beta=.30$ ;  $p<.05$ ).

## CONCLUSIONS

As expected, depression was positively related with DIF, DDF, MS, IS, SS, anxiety, GPM and EDR. These findings are consistent to previous studies, which shown that high level of

*The relationship between alexithymia, defense mechanisms, eating disorders, anxiety and depression*

Table 1. Descriptive analyses and correlations.

		M	SD	1	2	3	4	5	6	7	8	9	10	11
1	Difficulty identifying feelings	14.12	5.39											
2	Difficulty defining feelings	11.86	4.22	.51**										
3	Expressive externally oriented thought	15.47	4.05	.11	.22**									
4	Alexithymia	41.44	9.91	.80**	.79**	.56**								
5	Depression	9.93	7.60	.47**	.30**	.01	.39**							
6	Anxiety	15.08	11.73	.46**	.19**	-.08	.30**	.62**						
7	Maladaptive style	3.79	.93	.50**	.31**	.05	.42**	.51**	.46**					
8	Image – distorting style	3.85	1.01	.20**	.21**	.06	.22**	.14*	.12*	.51*				
9	Self – sacrificing style	3.99	1.03	.18**	.05	-.04	.10	.18**	.15**	.34**	.18**			
10	Adaptive style	5.06	1.25	.02	-.09	-.19**	-.03	-.08	-.05	.18**	.17**	.28**		
11	General psychological maladjustment	52.48	18.43	.57**	.38**	.11	.52**	.63**	.53**	.63**	.27**	.15**	-.05	
12	Eating disorder risk	26.85	24.71	.18**	.11	.06	.17**	.37**	.33**	.30**	.06	.03	-.06	.53**

Note: \*\* p<.01; \*p<.05

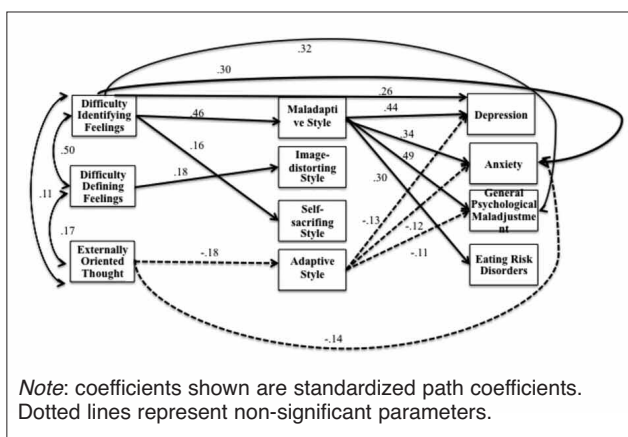


Figure 1. Full mediation models between alexithymia, defense mechanism, anxiety, depression and eating disorders.

Alexithymia are related to depression<sup>12</sup>. Depressive symptoms are associated with a worse outcome in a wide range of diseases<sup>63-65</sup> and patients with depression typically engage in emotional inhibition strategies to deal with their symptoms and consequently they have more difficulties in subjectively identifying and describing their emotions<sup>66</sup>. Patients with depression typically are not able to use functional way to recognize emotions properly, consequently they may be more prone to maladjustment<sup>12</sup>.

Furthermore, depression was positively related to MS, IS, SS. These results are consistent to previous findings which

highlighted how low defense maturity were associated with depressive symptoms<sup>16</sup> and how mature defense style is less common<sup>38</sup>. The usage of dysfunctional defense mechanisms by individuals with depression may represent either the influence of an active disabling illness, or a potentially pre-morbid risk factor for the development and maintenance of the disorder itself<sup>67</sup>.

Furthermore, depression was positively related with anxiety, GPM and EDR. Negative affectivity may intervene in the way of perceiving reality and coping with problems, predisposing individuals to a greater extent of

global maladjustment in presence of both dysfunctional mood and eating disorders subcomponents<sup>68</sup>.

As expected, anxiety was positively related with DIF, difficulty defining feelings and TAS global score. These results are consistent with previous findings<sup>11</sup>.

An inability to modulate emotions might explain why some people with alexithymia are prone to discharge tension arising from unpleasant emotional states through dysfunctional behaviors and unpleasant physical states<sup>69</sup>.

As expected, anxiety positively correlated with GPM and EDR. These results suggest that these anxiety processes may not only contribute to specific symptomatology that are commonly found in specific ED<sup>14</sup>, but also to the anxious and depressive processes underlying general ED functioning.

Furthermore, Depression positively correlated with anxiety, MS, IS, SS. These results are consistent to previous findings, which highlighted a positive correlation between anxiety and depression and how mature defense mechanism positively relate with them<sup>38,40</sup>. In presence of anxiety, individuals may have difficulties to successfully adjust to both contextual and emotional demands, consequently they may use less adaptive defense mechanisms in order to cope with potential threats<sup>31</sup>.



As expected, GPM positively related with DIF, DDF and TAS total score.

ED might be a result of difficulty in regulating the negative emotions that accompany perceptions, and people with low levels of emotion management usually experience difficulties in identifying and expressing emotions, and in distinguishing between emotional states and physical sensations<sup>68,69</sup>.

Furthermore, GPM was positively related with MS, IS, SS. These results are consistent to previous findings<sup>29,37</sup> which showed how maladaptive defense mechanisms are more relevant than AS mechanisms in ED. These findings are consistent with previous results that consistently found, compared to non-eating-disordered controls, individuals with an eating disorder used more maladaptive defensive functioning styles<sup>34,35</sup>.

The usage of immature defense mechanisms in ED may represent either the influence of an active impairment, the result of a prolonged disorder that affects one's functioning, or a potentially premorbid risk factor for the development and maintenance of the disorder<sup>37</sup>.

These findings provide general support a hierarchical view of defense mechanisms<sup>70-72</sup>.

Our results may support the hypothesis that mature defense mechanisms promote adjustment, since they allow an individual to view his environment in a functional way, protecting him against depression, anxiety and eating disorder<sup>73</sup>.

The purpose of this study was to test a mediation model in which the relationship between alexithymia depression, anxiety and eating disorders is mediated by defense mechanisms.

Our results are in line with previous findings that integrate alexithymia and defense mechanisms concurrently<sup>26</sup>, suggesting that less presence of alexithymia is (indirectly, through increased mature defence mechanisms) associated with fewer eating disorders, depression and anxiety. The persistent experience of emotion processing impairment may not allow the development of adequate strategies to self-regulate emotion, and this could be translated into maladaptive compensatory behaviours to modulate emotions, such as eating disorders<sup>74</sup>, whereas individuals with more adaptive defense mechanisms may be more likely to understand, regulate, and use emotional information to cope with daily stressors and threats, consequently they may tend to be more adapted to their environment and have a better adjustment, resulting in a better level of adaptation<sup>14,37,38</sup>. Difficulties in identifying and describing emotions and dysfunctional emotion regulation may be associated with dysfunctional support-seeking strategies, and consequently this may inhibit the development of adaptive defense mechanisms, whereas an adaptive ability to understand, regulate, and use emotional information may facilitate the usage of more mature defense mechanisms<sup>67</sup>.

Finally, this study provides a relevant contribution to the relationship between alexithymia, depression, anxiety and eating disorders. In the present study, there are some limitations to take into account. Firstly, the small number of participants necessitates caution about the generalizability of the results. Secondly, the exclusive use of self-reports for measuring a subjective experience could increase measurement bias, for this reason, future studies should use objective measures and/or multi-rating sources.

Despite these limitations, this study provides significant practical and theoretical insights.

First of all, from a practical point of view, the results underline the fact that individuals with immature defense

mechanisms and high levels of alexithymia might be vulnerable to developing maladjustment.

Psychotherapies and psychological training programmes that have shown their efficacy in preventive and clinical contexts<sup>75-79</sup> could integrate alexithymia and defense mechanisms assessment in order to provide a more complete view of psychopathology.

Assessing alexithymia and defense mechanism may facilitate adherence in psychotherapy and constitute a beneficial factor of outcome<sup>7</sup>, consequently, changing in defense mechanism functioning may be an important aspect of psychotherapy that is related to improved symptoms during psychotherapy<sup>80,81</sup>.

Finally, integrating aspects of alexithymia and defense mechanisms should provide a more holistic and comprehensive model for the understanding of psychological mechanisms underlying psychological maladjustment.

*Conflict of interests:* the authors have no conflict of interests to declare.

## REFERENCES

1. Vanheule S. Challenges for alexithymia research. *J Clin Psychol* 2008; 64: 332-3.
2. Kreibig SD. Autonomic nervous system activity in emotion: a review. *Biol Psychol* 2010; 84: 394-421.
3. Nemiah JC. A psychodynamic view of psychosomatic medicine. *Psychosom Med* 2000; 62: 299-303.
4. Grabe HJ, Schwahn C, Barnow S, et al. Alexithymia, hypertension, and subclinical atherosclerosis in the general population. *J Psychosom Res* 2010; 68: 139-47.
5. Salminen JK, Saarijärvi S, Toikka T, Kauhanen J, Aairela E. Alexithymia behaves as a personality trait over a 5-year period in Finnish general population. *J Psychosom Res* 2006; 61: 275-8.
6. Aaron RV, Benson TL, Park S. Investigating the role of alexithymia on the empathic deficits found in schizotypy and autism spectrum traits. *Pers Individ Dif* 2015; 77: 215-20.
7. Leweke L, Bausch S, Leichsenring F, Walter B, Stingl M. Alexithymia as a predictor of outcome of psychodynamically oriented inpatient treatment. *Psychother Res* 2009; 19: 323-31.
8. Quilty LC, Taylor GJ, McBride C, Bagby MR. Relationships among alexithymia, therapeutic alliance, and psychotherapy outcome in major depressive disorder. *Psychother Res* 2017; 254: 75-9.
9. Karukivi M, Saarijärvi S. Development of alexithymic personality features. *World J Psychiatry* 2014; 4: 91.
10. Cuzzocrea F, Barberis N, Costa S, Larcan R. Relationship between alexithymia, parenting style, and parent control. *Psychol Rep* 2015; 117: 580-96.
11. Hendryx MS, Haviland MG, Shaw DG. Dimensions of alexithymia and their relationships to anxiety and depression. *J Pers Assess* 1991; 56: 227-37.
12. Li S, Zhang B, Guo Y, Zhang J. The association between alexithymia as assessed by the 20-item Toronto Alexithymia Scale and depression: a meta-analysis. *Psychiatry Res* 2015; 227: 1-9.
13. Nowakowski ME, McFarlane T, Cassin S. Alexithymia and eating disorders: a critical review of the literature. *J Eat Disord* 2013; 18: 1-21.
14. Westwood H, Kerr-Gaffney J, Stahl D, Tchanturia K. Alexithymia in eating disorders: systematic review and meta-analyses of studies using the Toronto Alexithymia Scale. *J Psychosom Res* 2017; 99: 66-81.
15. Riccobono G, Pompili A, Iannitelli A, Pacitti F. The relationship between Night Eating Syndrome, depression and chronotype in a non-clinical adolescent population. *Riv Psichiatr* 2019; 54: 115-9.
16. Bogutyn T, Pałczyński J, Kokoszka A, Holas P. Defense mechanisms in alexithymia. *Psychol Rep* 1999; 84: 183-7.

*The relationship between alexithymia, defense mechanisms, eating disorders, anxiety and depression*

17. McWilliams N. Psychoanalytic case formulation. New York: Guilford Press, 1999.
18. Constantinides P, Beck SM. Towards developing a scale to empirically measure psychotic defense mechanisms. *J Am Psychoanal Assoc* 2010; 58: 1159-88.
19. Cramer P. The development of defense mechanisms: theory, research, and assessment. New York: Springer-Verlag, 1991.
20. Porcerelli JH, Huth-Bocks A, Huprich SK, Richardson L. Defense mechanisms of pregnant mothers predict attachment security, social-emotional competence, and behavior problems in their toddlers. *Am J Psychiatry* 2016; 173: 138-46.
21. Boerner M, Joseph S, Murphy D. Reports of post-traumatic growth and well-being: moderating effect of defense style. *J Soc Clin Psychol* 2017; 369: 723-37.
22. Goulia P, Voulgari PV, Tsifetaki N, et al. Sense of coherence and self-sacrificing defense style as predictors of psychological distress and quality of life in rheumatoid arthritis: a 5-year prospective study. *Rheumatol Int* 2014; 35: 691-700.
23. Khazemi S, Khosravi S. Predicting the defense mechanisms based on personality traits in university employees. *Int J Pharm Res Allied Sci* 2016; 5: 273-9.
24. Jonason PK, Fletcher SA, Hashmani T. Externalizing and internalizing, but not rationalizing: Some psychodynamic biases associated with the Dark Triad traits. *Pers Individ Dif* 2019; 137: 9-11.
25. Carvalho AF, Hyphantis TN, Taunay TC, et al. The relationship between affective temperaments, defensive styles and depressive symptoms in a large sample. *J Affect Disord* 2013; 146: 58-65.
26. Rahimian Boogar I, Rezaei A, Mohamadpoor S. Quality of life in coronary heart disease patients: the role of defense mechanisms and alexithymia with mediation of psychological distress. *Iran J Psychiatry Behav Sci* 2017.
27. Ranjbari T, Besharat MA, Pourhossein R. The mediating role of defense mechanism in the relationship between attachment pathologies and the symptoms of depression and anxiety. *Dev Psychol* 2017; 14: 15-27.
28. Thome A. Alexithymia and acquired immune deficiency syndrome. *Psychother Psychosom* 1990; 54: 40-3.
29. Gitzinger I. Defense styles in eating disorders. In: Hentschel U, Smith GJW, Ehlers W, Draguns JG (eds). The concept of defense mechanisms in contemporary psychology. New York: Springer, 1993.
30. Spinhoven P, Kooiman, C. Defense style in depressed and anxious psychiatric outpatients: an explorative study. *J Nerv Ment Dis* 1997; 185: 87-94.
31. Colovic O, Lecic T, Dusica LT, Perunicic I, Milosavljevic M, Munjiza A. Defense mechanisms in "pure" anxiety and "pure" depressive disorders. *J Nerv Ment Dis* 2016; 204: 1.
32. American Psychiatric Association. Diagnostic and statistical manual of mental disorders (5th ed). Arlington, VA: American Psychiatric Publishing, 2013.
33. McCarter T. Depression overview. *Am Health Drug Benefits* 2008; 1: 44-51.
34. Bond M. Empirical studies of defense style: relationships with psychopathology and change. *Harv Rev Psychiatry* 2004; 12: 263-78.
35. Poikolainen K, Kanerva R, Marttunen M, Lonnqvist J. Defense styles and other risk factors for eating disorders among female adolescents: a case-control study. *Eur Eat Disord Rev* 2001; 9: 325-34.
36. Tordjman S, Zittoun C, Ferrari P, Flament M, Jeammet PA. Comparative study of Defense styles of bulimic, anorexic and normal females. *Isr J Psychiatry Relat Sci* 1997; 34: 222-7.
37. Vidovic V, Henigsberg N, Juresa V. Anxiety and Defense styles in eating disorders. *Coll Antropol* 2003; 27: 125-34.
38. Waqas A, Rehman A, Malik A, Muhammad U, Khan S, Mahmood N. Association of ego defense mechanisms with academic performance, anxiety and depression in medical students: a mixed method study. *Cureus* 2015; 7.
39. Colovic O, Lecic T, Dusica LT, Perunicic I, Milosavljevic M, Munjiza A. Defense mechanisms in "pure" anxiety and "pure" depressive disorders. *J Nerv Ment Dis* 2016; 204: 1.
40. Quattropani MC, Lenzo V, Filastro A. Predictive factors of anxiety and depression symptoms in patients with breast cancer undergoing chemotherapy. An explorative study based on metacognitions. *J Psychopathology* 2017; 23: 1-7.
41. Martino ML, Gargiulo A, Lemmo D, Margherita G. Cancer blog narratives: the experience of under-fifty women with breast cancer during different times after diagnosis. *Qual Rep* 2019; 24: 158-73.
42. Martino ML, Lemmo D, Gargiulo A, et al. Underfifty women and breast cancer: narrative markers of meaning-making in traumatic experience. *Front Psychol* 2019; 10: 1-12.
43. Margherita G, Gargiulo A. A comparison between pro-anorexia and non-suicidal self-injury blogs: from symptom-based identity to sharing of emotions. *Psychodynamic Pract* 2018; 24: 346-63.
44. Miranda B, Rodrigues Louzã M. The physician's quality of life: relationship with ego Defense mechanisms an object relations. *Compr Psychiatry* 2015; 63: 22-9.
45. Bond M. Defense Style Questionnaire. In: Vaillant GE (ed). Empirical studies of ego mechanisms of defense. Washington, DC: American Psychiatric Press, 1986.
46. San Martini P, Roma P, Sarti S, Lingardi V, Bond M. Italian Version of the Defense Style Questionnaire. *Compr Psychiatry* 2004; 45: 483-96.
47. Bagby RM, Parker JDA, Taylor GJ. The Twenty-item Toronto Alexithymia Scale: item selection and cross-validation of the factor structure. *J Psychosom Res* 1994; 38: 23-32.
48. Bressi C, Taylor G, Parker J, et al. Cross validation of the factor structure of the 20 item Toronto Alexithymia Scale: an Italian multicenter study. *J Psychosom Res* 1996; 41: 551-9.
49. Beck AT, Steer RA, Brown GK. Beck Depression Inventory Second Edition Manual. San Antonio, TX: The Psychological Corporation Harcourt Brace & Company, 1996.
50. Ghisi M, Flebus GB, Montano A, Sanavio E, Sica C. Italian adaptation from Beck AT, Steer RA, Brown GK (1996). BDI-II, Beck Depression Inventory-II. Firenze: Giunti OS, 2006.
51. Wang YP, Gorenstein C. Assessment of depression in medical patients: a systematic review of the utility of the Beck Depression Inventory-II. *Clinics* 2013; 9: 1274-87.
52. Whisman MA, Richardson ED. Normative data on the beck depression inventory - Second Edition (BDI-II) in college students. *J Clin Psychol* 2015; 71: 898-907.
53. Sica C, Ghisi M. The Italian versions of the Beck Anxiety Inventory and the Beck Depression Inventory-II: psychometric properties and discriminant power. In: Lange MA (ed). Leading-edge psychological tests and testing research. Hauppauge, New York: NOVA Publishers, 2007.
54. Beck AT, Epstein N, Brown G, Steer RA. An inventory for measuring clinical anxiety: psychometric properties. *J Consult Clin Psychol* 1988; 56: 893-7.
55. Sica C, Coradeschi D, Ghisi M, Sanavio E. Beck Anxiety Inventory. Adattamento italiano: Manuale. Firenze: Giunti OS, 2006.
56. Muntingh AD, van der Feltz-Cornelis CM, van Marwijk HW, Spinhoven P, Penninx BW, van Balkom AJ. Is the Beck Anxiety Inventory a good tool to assess the severity of anxiety? A primary care study in the Netherlands Study of Depression and Anxiety (NESDA). *BMC Fam Pract* 2011; 12: 66.
57. Garner DM. Eating Disorder Inventory-3. Professional Manual. Lutz, FL: Psychological Assessment Resources, 2004.
58. Giannini M, Pannocchia L, Dalle Grave R, Muratori F. Adattamento italiano dell'EDI-3. Eating Disorder Inventory-3. Firenze: Giunti OS, 2008.
59. Clausen L, Rosenvinge JH, Friberg O, Rokkedal K. Validating the Eating Disorder Inventory-3 (EDI-3): a comparison between 561 female eating disorders patients and 878 females from the general population. *J Psychopathol Behav Assess* 2010; 33: 101-10.

60. Smith KE, Mason TB, Leonard RC, et al. Affective predictors of the severity and change in eating psychopathology in residential eating disorder treatment: the role of social anxiety. *Eat Disord* 2018; 26: 66-78.
61. Cumella E. Review of the Eating Disorder Inventory-3. *J Pers Assess* 2006; 87: 116-7.
62. Pedhazur E. Multiple regression in behavioral research: explanation and prediction (3rd ed.). Fort Worth, TX: Harcourt Brace College Publishers, 1997.
63. Quattropiani MC, Geraci A, Lenzo V, et al. Post stroke anxiety and depression: relationships to cognitive rehabilitation outcome. *Clin Neuropsychiatry J Treat Eval* 2018; 15: 12-8.
64. Quattropiani MC, Lenzo V, Armieri V, et al. The origin of depression in Alzheimer disease: a systematic review. *Riv Psichiatr* 2018; 53: 18-30.
65. Quattropiani MC, Lenzo V, Filastro A. The role of metacognition in multiple sclerosis: a clinical study and assessment of possible correlation with anxiety, depression and coping strategy. *Euro-Mediterr Biom J* 2018; 13: 39-45.
66. Son SH, Jo H, Rim HD, et al. A comparative study on alexithymia in depressive, somatoform, anxiety, and psychotic disorders among Koreans. *Psychiatry Investig* 2012; 9: 325-31.
67. Laczkovics C, Fonzo G, Bendixsen B, et al. Defense mechanism is predicted by attachment and mediates the maladaptive influence of insecure attachment on adolescent mental health. *Curr Psychol* 2018; 1-9.
68. Berkman ND, Lohr KN, Bulik CM. Outcomes of eating disorders: a systematic review of the literature. *Int J Eat Disord* 2007; 40: 293-309.
69. Caslini M, Rivolta L, Zappa LE, Carrà G, Clerici M. Psychotherapeutic treatment of eating disorders improve dissociative experiences and impulse regulation but not alexithymia. A case series report. *Riv Psichiatr* 2019; 19: 21-53.
70. Stein D, Bronstein Y, Weizman A. Defense mechanisms in a community-based sample of female adolescents with partial eating disorders. *Int J Psychiatry Med* 2003; 33: 343-55.
71. Bond M, Perry JC. Long-term changes in Defense styles with psychodynamic psychotherapy for depressive, anxiety, and personality disorders. *Am J Psychiatry* 2004; 161: 1665-71.
72. Soldz S, Vaillant GE. A 50-year longitudinal study of Defense use among inner city men: a validation of the DSM-IV Defense axis. *J Nerv Ment Dis* 1998; 186: 104-11.
73. Vaillant GE, Mukamal K. Successful aging. *Am J Psychiatry* 2001; 158: 839-47.
74. Barberis N, Costa S, Cuzzocrea F, Quattropiani MC. Trait EI in the relationship between needs fulfilment and symptoms and attitudes associated with EDs. *Ment Health Prev* 2018; 10: 50-5.
75. Dingemans A, Danner U, Parks M. Emotion regulation in binge eating disorder: a review. *Nutrients* 2017; 9: 1274.
76. Dicé F, Dolce P, Maiello A, Freda MF. Exploring emotions in dialog between health provider, parent and child. An observational study in pediatric primary care. *Prat Psychol* 2020; in press.
77. Dicé F, Santaniello A, Gerardi F, et al. Gli interventi assistiti dagli animali come processi di promozione della salute. Una review sistematica. *Psicol Sal* 2018; 3: 5-23.
78. Dicé F, Auricchio M, Boursier V, et al. Lo Scaffolding psicologico per la presa in carico delle condizioni Intersex/DSD. I Setting di Ascolto Congiunto. *Psicol Sal* 2018; 1: 129-45.
79. Dicé F, Dolce P, Freda MF. Exploring emotions and the shared decision-making process in pediatric primary care, Mediterranean J Clin Psychol 2016; 4: 1-31.
80. Tasca GA, Brugnera A, Baldwin D, et al. Reliability and validity of the Experiences in Close Relationships Scale-12: attachment dimensions in a clinical sample with eating disorders. *Int J Eat Disord* 2018; 51: 18-27.
81. Lenzo V, Gargano MT, Mucciardi M, Lo Verso G, Quattropiani MC. Clinical efficacy and therapeutic alliance in a time-limited group therapy for young adults. *Res Psychother* 2015; 17: 9-20.