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The Axial Diagnostic Criteria for Depression. Development, construct and predictive validity and reliability

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Introduction. The authors have developed a new axial diagnostic criterion for depression (ADCD) made up of seven items: mood, motivation/interest, impulse/drive, liking/pleasure, daily job, energy and different quality. They have aimed to examine its predictive validity and reliability, psychometric properties and constructive validity. There are few studies that have examined the psychometric properties of other diagnostic criteria for depression currently in use.

Material and methods. A total of 111 psychiatric outpatients who attended an out-patient clinic consecutively were interviewed. Sixty met the ICD-10 criteria for depressive episode and 51 formed a part of the control group: non-depressed psychiatric outpatients. For the interview, the authors used a brief self-administered questionnaire (IDASD) in which the patients indicated how they felt. Each item had a Visual Analogue Scale so that the subjects could quantify their answers.

Results. Four or more items are needed for the ADCD to correctly diagnose depression. At least two of these should belong to a group of three items that were extracted using a discriminant function (mood, energy and different quality).

The ADCD constructed in this way has a 0.93 sensitivity and 0.82 specificity, with a kappa reliability of 0.76 and a proportion of total cases correctly classified ranging from 88% to 93%. Specificity reaches up to 0.92 when the control group is formed exclusively by symptom-free psychiatric outpatients.

A factor analysis reveals that the ADCD is a one-dimensional model that has good construct validity (0.69). It also has good alpha reliability (α = 0.92), elevated consistency of the two halves of the test (R = 0.91) and a high test-retest correlation (r = 0.67).

The ADCD diagnostic agreement between two psychiatrists who use the IDASD as a data source is very high (κ: 1.00).

Conclusions. The ADCD/IDASD system offers a valid and reliable procedure to diagnose depression. It also has an excellent internal architecture, good construct validity and internal consistency. These data are much more than what can be said about other more used diagnostic criteria, which lack this information.

Key words:
Depression. Diagnostic criteria. Validation. Constructive validity. Evaluation.

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El Criterio diagnóstico axial para la depresión. Desarrollo, validez constructiva, validez predictiva y fiabilidad

Introducción. Los autores desarrollan un nuevo Criterio diagnóstico para la depresión (CDAD) compuesto por siete ítems: ánimo, motivación/interés, impulso, gusto/placer, trabajo cotidiano, energía y distinta cualidad. Se proponen examinar su validez predictiva, y fiabilidad, así como sus propiedades psicométricas y su validez constructiva. Existen pocos estudios que hayan examinado las propiedades psicométricas de otros criterios diagnósticos para la depresión actualmente en uso.

Material y métodos. Entrevistan a 111 pacientes psiquiátricos atendidos consecutivamente en régimen ambulatorio. Sesenta cumplían los criterios para episodio depresivo de la CIE-10 y 51 formaban parte del grupo de control: enfermos psiquiátricos no deprimidos. Utilizan para ello un breve cuestionario autoaplicado (IDASD) donde los pacientes señalan cómo se encuentran. Cada ítem tiene una escala analógico visual para que los sujetos cuantifiquen sus respuestas.

Resultados. Para que el CDAD diagnostique correctamente depresión, debe exigírsele reunir cuatro ítems o más. De ellos, al menos dos deben pertenecer a un grupo de tres ítems que fueron extraídos mediante una función discriminante (ánimo, energía y distinta cualidad).

El CDAD así construido tiene una sensibilidad de 0,93 y una especificidad de 0,82, con una fiabilidad kappa de

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0,76 y una proporción de casos totales acertados del 88% al 93%. Cuando el grupo de control está formado exclusivamente por pacientes psiquiátricos asintomáticos, la especificidad sube hasta 0,92.

Un análisis factorial revela que el CDAD es unidimensional y tiene una buena validez de constructo (0,69). También tiene una buena fiabilidad alfa (α = 0,92), una consistencia por la prueba de las dos mitades elevada (R = 0,91) y una correlación test-retest alta (r = 0,67).

El acuerdo diagnóstico CDAD entre dos psiquiatras que utilizan como fuente de datos el IDASD es muy alta (κ: 1,00).

Conclusiones. El sistema CDAD/IDASD ofrece un procedimiento para diagnosticar depresión valido y fiable. También posee una excelente arquitectura interna, una buena validez de constructo y consistencia interna. Estos datos son mucho más de lo que se puede decir de otros criterios diagnósticos más al uso, de los que se carece de esta información.

Palabras clave:
Terapia electroconvulsiva. Hipótesis anticonvulsiva. Electrofisiología. Mecanismo de acción.

INTRODUCTION

Operational diagnostic criteria (ODC) were created about 30 years ago to solve the important problem of diagnostic reliability.[1,2] Using it has helped many previously incorrectly classified cases of depression to be diagnosed and to increase the diagnostic reliability between psychiatrists.[3]

Although its initial purpose was to homogenize the diagnostic criteria of the evaluators, it was soon proven that the ODCs for depression were those for which the least agreement was found among the psychiatrists, above all for those cases having middle or low symptom intensity.[4] This is partially because psychiatrists interpret the presence of the different items differently[5] and also because of the debatable intrinsic validity of the ODCs themselves.

In spite of their relative predictive validity and reliability, since their use became generalized after the DSM-III was published,[6] serious doubts have always been expressed about the constructive validity of the ODCs for depression (and of other disorders). Given the scant attention that this type of research has received, the lack of confidence regarding the construct validity of the ODCs for depression in use is still unsolved and it remains unknown if they really diagnose what they are said to diagnose.[7,8]

The ODCs referring to depression contain a list of symptoms that, being frequent in the disease, are not specific to it. Thus, weight loss, insomnia, suicidal ideation and vegetative symptoms are symptoms that also appear in disorders other than depression and form a part of the ODCs of other alterations, which decreases their validity. It is likely that such a circumstance is also the reason for the exponential increase of the co-morbidities that led to the introduction of these ODCs.[9]

Some time ago, the authors reported that these symptoms, repeated in the ODCs of different disorders, and therefore not at all specific to them, are superfluous in the ODCs for depression.[10] It seems that others are now reaching the same conclusion.[11]

Several reasons exist that make it possible to doubt the constructive validity of the ODCs for depression: a) they use a wide range of items and not all of them are equally important (they have little sensitivity); b) many of these items are common to several criteria, which gives rise to the widespread comorbidity found among the patients since such criteria have been used (they have little specificity); and c) the same weight has been given to most of the items of the diagnostic algorithm (they are not very precise).[12]

However, some authors have addressed the analysis of the internal validity of the ODCs for depression, focusing their interest on discovering the critical symptoms for the diagnosis of «endogenous» or «melancholic» depression. However, their results have not been very conclusive, since they found that the most frequent symptoms are not the most disciminant or the best predictive ones.[13,14,15] The only publication we know of that has analyzed the *construct validity* of an ODC, following the requirements of the current psychometry, also focused its study on the concept of «endogenous» depression.[16] The results of the latter research are disturbing because, although this concept (endogenous or melancholic depression) is reliable and has good predictive validity regarding clinical criteria, its constructive validity is less than 50%, this being a value that all the factor analysts consider to be insufficient.[17]

Within this context, and for the next editions of the DSM-V and the ICD-11, proposing the possibility of elaborating a new ODC that is more in accordance conceptually with the way the clinical psychiatrists understand depression seems appropriate. In other words, an ODC that is not limited to presenting a simple list of possible symptoms, but rather that only contains the core, central, essential or axial symptoms of depressions, which is what is really needed in order to diagnose depression. Furthermore, it should not contain the more uncertain items (remember, for example, that the insomnia reported by depressed patients is not always confirmed by the external observers[18]) and the vegetative symptoms contained in the current ones.

The *purpose* of the present investigation is to develop a new diagnostic criterion for depression that really has these characteristics and that has passed the tests of construct validity required in the postulates of modern psychometry. That is, that it really measures what it says it measures.

MATERIAL AND METHODS

The conceptual framework

The authors begin with a previously expressed concept of depression. They reject the idea that there is an «endogenous» or «melancholic» depression and another «neurotic» one. They only give a syndromic meaning to the concepts «endogeniform» and «neurotiform» applied to depression. Both syndromes will always be present in different proportions in all depressive patients.[10] The «endogenous» has been related in the bibliography to inhibition and the «neurotic» has frequently been related to anxiety.[19]

Based on the reviews made by many authors, it can be concluded that depressive disease refers to a state of feeling of emptiness and lack of energy that is accompanied by a decreased drive to do things and the ability to like them. Definitively, it refers to the decrease of the *bioton* that was described some time ago by Ewald,[20] which is mentioned in the ICD-10 with the periphrasis of: «*general level of activity.*»[21] Based on their numerous multivariate analyses, Mendels and Cochrane inferred that the most common and identifying syndrome of the depressive disease is that known by the clinical psychiatrists as «endogenous» or «endogeniform.»[22] Both for these authors and for us, this would be the basic axis on which all depressive symptoms would be developed, regardless of the intensity of their presence.[10]

This line of thought considers «endogenous» or «melancholic» as the depressive disease itself, a morbid syndrome that lacks the attributions given to it by the classical definitions, as different investigations have discovered: *lacking motivation* (in fact, less than 41% of «endogenous» depressions have been precipitated)[23], *becoming worse in the morning* (at least 50% of the «endogenous» depressions lack this circadian characteristic)[24], with *late insomnia* (objective observations do not always perceive this typology of insomnia)[18].

The decrease of «bioton» that really defines depression has inappropriately been called «vital sadness.»[25] Other authors prefer to call it *anelasticoendostgenia* (absence of inner driving force).[10]

In any case, the diagnostic criterion that is developed should contain the mentioned meanings and not include the less relevant items. It should not be a mere list of symptoms.

Selection of the variables

In order to select the items that should make up the new diagnostic criterion, the Axial Diagnostic Criterion for Depression (ADCD), two ideas have been taken into account: the concept of endogeniform or melancholic syndrome as a definition of the core symptoms of the depression, without the classical clinical attributions that the recent research has demonstrated to be irrelevant,[10,22] and the clinical reality that psychiatrists tend to use few variables to diagnose depression.[4]

Table 1 summarizes two investigations that have analyzed the importance of the symptoms related to the depressive concept that serves as reference to the present one. It can be verified that the most frequent symptoms do not always coincide with the most discriminant, or with the most predictive ones.[13,14] Taking the previous considerations into account, the authors selected the following items for the ADCD: «mood state,» «motivation and interest for things,» «impulse for the activity,» «liking or pleasure for the things,» «energy in the body,» «daily work» and «different quality.» Obviously, there are other symptoms that facilitate the diagnosis of depression, such as depressive ruminations or suicidal thoughts. However, the selection of the items for this investigation has given more consideration to the core or critical character of each one of them for the diagnosis (the decrease of the bioton or anelasticoendosthenia). After all, the remaining symptoms are a consequence of this core symptom axis.[10]

Subjects

A total of 111 patients over 18 years of age consecutively seen as out-patients in the Mental Health Center «Miraflores» in Alcobendas (Madrid) were included in the study. Sixty of them were assigned to the depressed patient group according to the clinical criterion of the psychiatrists evaluating them. It was then verified that they also fulfilled the ICD-10 diagnostic criteria for depressive episode (mild [n = 5], middle [n = 13] or severe [n = 40]). The rest of the patients included in the research made up the control group, first according to clinical criteria and after to the ICD-10. The authors divided it, in turn, into two subgroups. The first was made up of psychiatric patients without active symptoms who also did not have any ICD-10 diagnostic criteria at the time of evaluation (N= 26). The second group was with patients who still had active psychopathology, whether they fulfilled any other diagnostic criteria or not at the time of the evaluation (N= 25: 18 anxiety disorders, 5 schizophrenic disorders, 1 non-specific personality disorder, 1 chronic delusional disorder). None of the control subjects fulfilled the clinical or ICD-10 criteria for depressive episodes. The control sample was divided in this way assuming that some patients with other diagnoses and active symptoms could modify the results (false positives) regarding the subjects without symptoms. Knowing the frequency of these false positives helps to better know the specificity of the ADCD, which is always higher among the asymptomatic subjects.

The sociodemographic data of the study probands are shown in Table 2.

Table 1 Identification of the critical *endogenous* depressive symptoms (see text)

Symptoms	More frequent[13]	More discriminant[13]	More predictive[14]
Agitation/inhibition	+	+	
Different quality	+	+	+
Severe depressive mood*	+	+	
Loss of interest	+		+
Indifference	+	+	
No reactivity	+	+	
Inability to cry	+	+	
Loss of appetite/weight	+	+	
Depressive ruminations	+		
Suicidal tendencies	+		
Morning worsening		+	
Loss of pleasure			+
Depressive delusions		+	

*Frequently perceived as boredom, irritability, insipidity, gloomy, blunt, emotional flattening.

Procedure

During a regular psychiatric interview, the patients were informed about the type of study that was going to be done. The evaluation was performed after obtaining their informed consent to be included in the study. To do so, a protocol was filled out. It contained (besides the ICD-10 diagnostic criteria and the sociodemographic variables) the Axial Diagnostic and Follow-up Index for Depression (IDASD, see Annex), the 17-item Hamilton Depression Rating Scale (HDRS) in Spanish [26] and a 7-item Clinical Global Impression (CGI) scale applied to the depressive symptoms.[27] The IDASD was filled out by the patient, although the patient could receive help from the doctor, if they asked for it. The HDRS and the CGI were filled out by the investigating psychiatrist. Furthermore, the depressive patients were re-evaluated 30 days after the initial interview with the same protocol. This was not done with the control group to economize on investigator effort.

The Axial Diagnostic and Follow-up Index for Depression (IDASD)

This is a self-approved instrument developed parallelly to the ADCD proposed by the authors. Its creation makes it possible to express this diagnosis in a measurable way, to analyze it psychometrically and to eliminate the subjectivity of the psychiatrist in the obtaining of the symptom, thus reducing the inter-rater reliability risks. It is made up of the seven previously-mentioned items. The subject must reflect his/her situation during the previous two weeks in each one of these items, placing a cross at some point of the Visual Analogue Scale (VAS) provided for this purpose for each item. Adjectives were placed at the ends of each VAS that reflected antonym situations related to the item studied in order to orient the subject (see Annex). Each VAS had numbers going from one to ten at regular distances because it has been demonstrated that this has the same reliability as the common VAS, but that this is preferred by the patients.[28] This creates an instrument with discreet items that can be used as a continuous variable that is easy to use parametric statistics, [9] as is generally done with the HDRS. When the purpose was only to observe the presence of an item, regardless of its intensity, it was considered *present* if the VAS score was equal to or greater than six. The order of the items originally presented to the patients is that shown in all the Tables of this article. The definitive order provided in the Annex is based on the results of the research and responds to the need to visually facilitate the diagnostic process to other investigators. The direction of the number of the VAS of some items has been randomly reversed to disallow possible tendencies in the responses of the subjects, and they must be informed about this.

This is not the first time that the proposal has been made to use the VAS to evaluate mood states, given its ease of use. Some of these proposals, made up of only two items («mood» and «vigilance» or «downhearted» and «without value»), have been shown to identify 92% and 78% of the depressed subjects, respectively.[30,31]

The pair of adjectives normal/rare was used to evaluate the «different quality» because this was the one that achieved the greatest saturation in said factor in a previous investigation.[32]

Table 2 Sociodemographic data of the sample

Variables		Depressive group (N = 60)		Control group asymptomatic (N = 26)		Control group symptomatic (N = 25)	
		N	(%)	N	(%)	N	(%)
Gender[a]	Men	14	(23)	8	(31)	11	(44)
	Women	45	(77)	18	(69)	14	(56)
Age[b]	$\bar{\chi}$	48.22		45.92		37.00	
	σ	12.48		48.22		12.88	
Civil status[c]	Single	3	(5)	7	(27)	11	(44)
	Married/partner	45	(78)	17	(65)	13	(52)
	Divorced	6	(10)	2	(8)	1	(4)
	Widow(er)	4	(7)	–		–	
	Religious	–		–		–	
Living arrangement[d]							
Alone		5	(9)	2	(8)	1	(4)
With parents		3	(5)	4	(15)	10	(40)
With partner		16	(27)	8	(30)	7	(28)
Partner and children		29	(49)	9	(35)	6	(24)
Only with children		5	(9)	2	(8)	–	
Institution		1	(2)	1	(4)	1	(4)
Situación laboral[e]							
Active		13	(22)	15	(58)	10	(40)
Paid unemployment		3	(5)	2	(8)	1	(4)
Unpaid unemployment		4	(7)	2	(8)	5	(20)
Transient incapacity		26	(44)	2	(8)	7	(28)
Permanent incapacity		3	(5)	3	(12)	1	(4)
Retired		10	(17)	2	(8)	1	(4)
Socioeconomic level[f]							
High		2	(3)	2	(8)	2	(8)
Middle-high		8	(14)	6	(23)	3	(12)
Middle-middle		24	(41)	3	(12)	7	(28)
Middle-low		9	(15)	6	(23)	5	(20)
Low		16	(27)	9	(35)	8	(32)

[a]gl: 2; $\chi^2 = 3.45$; $p < 0.18$ (ns).
[b]ANOVA one factor, gl: 2; $F = 7.024$; $p = 0.001$ (with Bonferroni correction, $p < 0.05$).
[c]gl: 6; $\chi^2 = 20.81$; $p < 0.002$.
[d]gl:10; $\chi^2 = 20.03$; $p < 0.03$.
[e]gl:10; $\chi^2 = 22.62$; $p < 0.01$.
[f]gl: 8; $\chi^2 = 8.40$; $p < 0.396$ (ns).

Statistical analysis of the data

The predictive validity of the ADCD was analyzed by the calculation of sensitivity, specificity, kappa (κ) concordance coefficient and pi (π) probability of being correct.[33,34,5]

The determination of the most discriminant items was done with the Stepwise Discriminant Analysis (SDA), built step-by-step, with inclusion and exclusion criteria for F of 0.05 and 0.10, respectively.[29]

The analysis of the possible syndromic dimensions of the ADCD items was done with a Factor Analysis (FA), using the Principal Components methods plus a Varimax rotation. Extraction of factors was stopped when the characteristic roots reached values inferior to the unit.[35]

The factor analysis is also the procedure having the greater strength to analyze the construct validity or constructive validity of an instrument or diagnostic criterion, according to the case.[17] This validity is very much linked to the concept of reliability. The basic principal that supports this relationship is found in the First Theorem of the Factor Analysis Theory. A good description of this principle is found in Guilford and Fruchter.[29]

To calculate internal consistency and safety, the Cronbach alpha intraclass correlation coefficient[36] was selected for each item in particular and for the global criterion, since it effectively replaces the procedures of the two halves, the parallel test and the test-retest, for the reasons detailed in Carmines and Szeller.[37] In any event, the internal consistency of the ADCD was also analyzed by the item/total correction tests and the correlation of the two halves with the Spearman-Brown correction as well as the test-retest stability test.[29]

Paired comparisons were analyzed using the single-factor ANOVA or with the Chi-square test, as pertinent.[29,38] The coefficient of correlation used in each case was the Pearson product-moment correlation coefficient.[29] Except when indicated to the contrary, the significance levels established were also for two tails, and the minimum value required was invariably $p < 0.05$.

RESULTS

Development of the diagnostic criterion

To decide which diagnostic algorithm should be used to construct the ADCD, first of all, the number of items that the different subjects of the sample fulfilled was counted. In table 3, it can be seen that 95% of the depressed patients fulfilled four or more items of those included on the list proposed herein. Almost one third of the control group also fulfilled these characteristics (32%), although at the expense of the non-depressed patients who were still symptomatic. The asymptomatic controls only satisfied this condition in 12% of the cases.

This finding seems to indicate that the fulfilling of four or more items is the threshold that has the best balance needed to diagnose a subject of depression. To place the standard at three items would increase the sensitivity up to 95%, but, on the other hand, would provide 8% more false positives.

However, the criterion cannot be limited to the requirement of counting a certain number of items because not all of them have, *a priori,* the same diagnostic weight. Thus, a stepwise discriminant analysis was done step-by-step, in which belonging to the depressed group or to the control one was used as dependent variable and the items of the ADCD/IDASD system as independent variables. This made it possible to check if some items were more discriminant than others within the initially proposed list, which would give them greater weight in the criterion. The discriminant model obtained detected three items as being the most differentiating: «mood,» «energy» and «different quality.» Together, the three of them were capable of correctly classifying 81% of the subjects by themselves and the canonical correlation of these items with the discriminant function was 0.82. The Factor Analysis of these three single items showed the presence of a single factor that accounted for 77% of the total of the variance obtained, which indicates good construct validity.[33] Both analyses seemed to indicate that these three items made up a central nucleus that was more discriminating, predictive and homogeneous than the seven that made up the complete model of the ADCD/IDASD system. These three items were grouped under the name of Group A, and the rest of the items made up Group B.

Thus, out of the four minimum items required for the criterion to diagnose a subject of depression, the authors understand that some of those belonging to Group A should be mandatory. But, how many?

In Table 4, the basic predictive values of the diagnostic criterion created in this way are shown, using three different levels of requirement: that out of the four items that can be required, one, two or three items of Group A should be mandatory.

The requirement that seems to be the most balanced is that at least two out of the four minimum required items for the ADCD should belong to Group A. This considerably increases the sensitivity regarding that of requiring three, although it reduces specificity (at the expense of the symptomatic patients, but not of the asymptomatic ones). On the other hand, requiring one does not greatly improve sensitivity and worsens specificity regarding the symptomatic control group.

These findings make it possible to define the criterion as is shown in Table 5 and as is reflected in the IDASD (see Annex).

Predictive validity

Once the criterion was defined as seen in Table 5, its predictive values and reliability regarding the external criterion (the symptoms plus that of the ICD-10) had to be determined. Table 6 shows the predictive capacity of both the complete criterion and of each specific item. The diagnostic criterion of the ADCD/IDASD system has a more than reasonable predictive capacity, with 0.93 sensitivity and 0.82 specificity. The specificity value is influenced by the symptomatic control subjects (5 patients with some anxiety disorder and 2 with a somatomorphic disorder). As can be verified in Table 6, the specificity regarding the asymptomatic patients is greater.

Table 3 Number of items present for each type of subject

	Control group						Depressed group		
	Asymptomatic[a]		Symptomatic[b]		Both[c]				
Number of items collected	n	(%)	n	(%)	n	(%)	n	(%)	
None	19	(73)	3	(12)	22	(43)	0		
One	2	(8)	3	(12)	5	(10)	0		
Two	0		8	(32)	8	(16)	2	(3)	
Three	2	(8)	2	(8)	4	(8)	1	(2)	
Four	1	(4)	3	(12)	4	(8)	7	(12)	
Five	1	(4)	3	(12)	4	(8)	7	(12)	
Six	1	(4)	2	(8)	3	(6)	17	(28)	
Seven	0		1	(4)	1	(10)	26	(43)	
		12		36		32			95
With four or more	3	(100)	9	(100)	12	(100)	57	(100)	

Regarding the depressed group:
[a]gl: 7; χ^2: 70.12; p = 0.000.
[b]gl: 7; χ^2: 40.61; p = 0.000.
[c]gl: 7; χ^2: 66.74; p = 0.000.

The global likelihood of being correct with the depressive subjects is 84%. This value increases when an attempt is made to be correct regarding asymptomatic subjects (92%) and decreases to 75% regarding non-depressed subjects with active psychopathology.

The global likelihood of being correct with non-depressed subjects is 92%. This value changes very little regardless of whether it is dealing with asymptomatic subjects (93%) or subjects with another active psychopathology (91%). That is, it is very likely that a subject that can be identified as not-depressed by the ADCD /IDASD system is not really not-depressed.

All the other indicators speak in favor of the good predictive capacity of the ADCD /IDASD system, with a good proportion of total cases correct (88%-93%), an acceptable Youden Index[39] (that becomes greater as it approaches 1.00), with a global likelihood of being correct that ranges from 94%-96% and acceptable *kappa* reliability (κ= 0.76).

The same indicators applied to each item individually are, in general, equally good. In principle, this indicates that the authors had been correct when they selected them, above all when the depressed subjects are compared to asymptomatic ones.

Table 4 Selection of the number of items required for Group A

Criterion	Sensitivity	Specificity			Concordance		
Four items		Global	Symptomatic	Asymptomatic	κ^a	κ^b	κ^c
One of group A	0.95	0.76	0.64	0.92	0.72	0.60	0.86
Two of group A	0.93	0.82	0.69	0.92	0.76	0.68	0.84
Three of group A	0.73	0.94	0.08	1.00	0.66	*	0.62

[a]For all the controls.
[b]Only for the symptomatic controls.
[c]Only for the asymptomatic controls.
*Incalculable: too many zeros in some boxes.

Table 5 Definition of the Axial Diagnostic Criterion for Depression

For the two previous weeks, the subject maintains a state (almost permanent in intensity and time that is almost unmodifiable by environmental circumstances and represents a change in his/her usual situation) characterized by the presence of at least *four* of the following items, of which *two* should belong to *group* A.

Group A:

1. *Depressed mood state*. Sometimes expressed as a weak and downhearted states, sometimes irritable.
2. *Loss of energy.* Sometimes expressed as feeling weak, without strength, that «they are dragging their body.»
3. *Different quality of mood.* The patient indicates his/her current state as rare, not similar to any common known experience (such as the death of a loved one).

Group B:

4. The subject has lost *motivation* or *interest* for things.
5. The subject has lost *liking* or *pleasure* for things.
6. *The daily work* has become more tiring than usual.
7. The subject has loss *impulse for activity.*

The symptoms present cannot be attributed to any substance abuse (including alcohol and drugs), nor to physical disorders (endocrinological, metabolical, etc.) or any other organic mental disorder or to schizophrenia.

Construct validity

The factor analysis of all the items of the ADCD shows the presence of a single factor in which all of the items of the model have high saturation (> 0.70) (which made the Varimax rotation unnecessary). This indicates that the ADCD/IDASD system is unidimensional regarding the depressive symptoms model it analyzes. All the analysts of the factors coincide in stating that a factor analysis begins to be interpretable when it accounts for more than 50% of the total of the variance obtained.[40] The ADCD/IDASD system accounts for 69% (Table 7). The proportion of the total variance explained is a good indicator of the construct validity, as is indicated by the first theorem of the factor analysis theory.[29] Even more, all the items that make up the ADCD/IDASD system individually achieve a

Table 6 Predictive validity of the Axial Diagnostic Criterion for Depression

					% Total correct			Youden Index*			Likelihood of being correct %			Concordance**		
	sen	*esp*[a]	*esp*[b]	*esp*[c]	a[a]	a[b]	a[c]	J[a]	J[b]	J[c]	π^a	π^b	π^c	κ^a	κ^b	κ^c
Mood	0.88	0.84	0.76	0.92	86	85	90	0.72	0.64	0.80	92	92	95	0.73	0.64	0.76
Interest	0.75	0.77	0.60	0.92	76	71	80	0.52	0.35	0.69	86	82	89	0.51	0.33	0.59
Impulse	0.90	0.73	0.64	0.81	82	82	87	0.63	0.54	0.71	90	90	93	0.63	0.56	0.70
Liking/pleasure	0.72	0.72	0.60	0.85	72	68	76	0.44	0.32	0.57	83	80	86	0.44	0.29	0.49
Energy	0.90	0.75	0.60	0.89	83	81	90	0.65	0.50	0.79	91	89	95	0.65	0.52	0.76
Work	0.85	0.67	0.48	0.85	77	74	85	0.52	0.33	0.70	87	85	92	0.52	0.35	0.66
Quality	0.90	0.69	0.48	0.89	80	78	90	0.59	0.38	0.79	89	87	95	0.60	0.41	0.76
Diagnostic criteria	0.93	0.82	0.69	0.92	88	87	93	0.75	0.62	0.85	94	93	96	0.76	0.68	084

sen: sensitivity; *sp*: specificity; * Youden Index, J = (sen + sp – 1); **all the kappas (κ) p = 0.00.
[a]For all the controls.
[b]Only the symptomatic controls.
[c]Only the asymptomatic controls.

solid construct validity, superior to 75% of the total of the variance explained by each one of them. As can be seen in Table 7, the variance of error is very small in all of the cases as well as the specific variance (V_{sp}: the artifact systematically introduced by the construction of the ADCD).

Another indicator of the validity of the ADCD /IDASD system comes from obtaining a discriminant function that includes all the items that make it up and the accounts for 100% of the total variance obtained (Table 8). The function found accounts for 95% of the total variance obtained and has a global canonical correlation with the 0.79 criterion. This represents a high degree of association between the different items and the discriminant function. All of this speaks in favor of the uniformity and of the solid construct validity of ADCD. The significance level of this discriminant function is elevated (Wilks' Lambda: 0.38; gl: 7; $\chi^2 = 103.11$; p = 0.000), and correctly classifies 87% of the sample (92% of the cases and 82% of the no-cases).

Reliability

The ADCD/IDASD system also has a very elevated *alpha* reliability in all the cases and high accuracy for each item of the ADCD and for its global score. Or, what is the same, it has an elevated correlation between the scores obtained and the true (theoretical) ones.

The ADCD/IDASD system also achieves very good indicators in the different calculation methods of the reliability due to its *internal consistency* (Table 8). Thus, all the components of the model as a whole have a high and significant item/total correlation. If these correlation coefficients are squared, they become coefficients of determination and their value indicates the proportion of variance that each item shares with the total score of the ADCD/IDASD system. Each item shares an important magnitude of the significance on its total score. That is, if the total score represents the concept of underlying depression in the ADCD/IDASD system, the items that make up the total score share with it more than 60% and 70% of its variance. This is to be expected, on the other hand, after verifying the unidimensionality of the model by the previously commented factor analysis.

The test-retest reliability shows the temporal stability of the instruments, which is another safety indicator. The evaluation of depressed patients at two different evolution points is a very specific case. The performance of the test-retest is very conditioned by the circumstance that all the patients are under the effects of some antidepressant drug. Due to this, it can always be expected that some change will be found in symptom intensity. This interferes in the performance of this type of analysis with this type of instrument. However, the authors have made an attempt to do it, selecting those depressed subjects who were re-evaluated at 30 days and in whom the diagnosis was maintained, in addition to having a score on the CGI equal to or greater than four and a total score on the HDRS equal to or greater than 18. That is, subjects whose clinical situation would have undergone little variation regarding their initial symptom intensity (N = 19).

As seen in Table 8, the test-retest also shows significant results, with a good general correlation of the total of the model and also for each item specifically. The only two exceptions were the items «impulse» and «different quality.»

Table 7 Validity and safety of the Axial Diagnostic Criterion for Depression

Variables	h^2	V_{sp}	V_e	α	$\sqrt{\alpha}$
Mood	0.86	0.07	0.07	0.93	0.96
Interest	0.86	0.07	0.07	0.93	0.96
Impulse	0.88	0.06	0.06	0.94	0.97
Liking/pleasure	0.79	0.12	0.09	0.91	0.95
Energy	0.85	0.08	0.07	0.93	0.96
Work	0.79	0.12	0.09	0.91	0.95
Quality	0.79	0.12	0.09	0.91	0.95
Total	0.69	0.23	0.08	0.92	0.96

h^2 = communality, common factor variance or construct validity index.
V_{sp}= specific variance ($\alpha - h^2$).
V_e= variance of error ($1 - \alpha$).
α = reliability (calculated according to text).
$\sqrt{\alpha}$ = accuracy.

Table 8 Validity and internal consistency of the Axial Diagnostic Criterion for Depression

	Construct validity (h^2)[a]	Canonic[b] discriminant function	r Ítem/ total[c]	r^2	α	r^d Test-retest
Mood	0.86	0.43	0.85	0.72	0.93	0.66*
Interest	0.86	0.17	0.85	0.72	0.93	0.73*
Impulse	0.88	0.14	0.88	0.77	0.94	0.12
Liking/pleasure	0.79	0.10	0.79	0.62	0.91	0.72*
Energy	0.85	0.37	0.84	0.71	0.93	0.46*
Work	0.79	0.01	0.79	0.62	0.91	0.74*
Quality	0.79	0.39	0.80	0.64	0.91	0.03
Total	0.69	0.95	1.00	1.00	0.92	0.67*

[a]Common factor variance or communality determined by factor analysis (see text).
[b]Typified coefficients, the function explains 95% of the variance (see text).
[c]All at $p < 0.01$.
[d]Subjects who fulfill the initial diagnostic criteria on day 30 and have a total score on the HDRS above 18 points in addition to a CGI equal to or greater than 4 (N = 19).
*All significant at p= 0.00 (not marked, not significant at minimum levels required of $p < 0.05$).

However, the design of this investigation does not allow for arguments that make it possible to attribute this behavior to a hypothetical limited temporal reliability of these items or to the possible modification that their intensity may have undergone after 30 days of treatment.

The test of the two halves has also been performed to analyze the internal consistency of the ADCD/IDASD system. One half was constructed with the odd items («mood,» «impulse,» «energy» and «different quality») and the other with the pairs («interest,» «pleasure» and «work»). The correlation that the total scores of the two halves obtained was r= 0.84 (p= 0.000). Applying the Spearman-Brown correlation to that value, a reliability index was obtained by the method of the two halves of R= 0.91 (calculated for unequal halves). This is quite high. Both halves also have an elevated individual *alpha* reliability: 0.89 for the odd items half and 0.82 for the pair items half.

DISCUSSION AND CONCLUSIONS

The authors have shown the steps followed to develop the ADCD they have proposed and the results of the study made on the constructive validity and its predictive capacity regarding an external criterion, both clinical as well as another known operational one (ICD-10), far from the lack of clarity with which the other commonly used ODCs were developed.[41]

The results of the present investigation seem to demonstrate that an ODC can be developed for depression only considering a few crucial symptoms that represent the core of the depression without losing relevant information. It was proven some time ago that, in fact, the psychiatrists used very few symptoms to establish the diagnosis of depression, even to classify them (in presence of inhibition, they diagnosed endogeneity and in the presence of neurotic personality, they diagnosed neurotic depression).[5] Other authors have also supported the use of the VAS to evaluate depressions due to their ease of use, and they have reported acceptable predictive values to make diagnoses using only two items.[28,30,31] Such results support the authors in their attempt to develop the ADCD with the characteristics of being short and of collecting the information directly from the patients, without the interpretive insertion of the psychiatrist, by the use of the VAS.

Some time ago, we advocated developing an ODC for depression that did not include the symptoms that recent research has demonstrated to be less relevant for the diagnosis without prejudging the type of depression.[42] This present investigation responds to that proposal. Currently, other investigators also insist on simplifying the ODCs for depression in use, following a different line of thought.[43]

Each one of the seven items selected to construct the ADCD offer a reasonable and acceptable diagnostic predictive validity and reliability regarding an external criterion. In this way, they demonstrate their adequacy to form the ADCD. The ADCD, as a whole, also offers good predictive safety values and diagnostic capacity. This certainty is a lot more than the data available on other ODCs

more in use. The different investigators have been more concerned about analyzing the predictive validity of the ODCs versus external biological markers than against a clinical type criterion that is the first that classifies any patient.[44] Furthermore, more than the validity of the ODCs themselves, their principal interest was to stress the diagnostic reliability it obtains among the psychiatrists with its use.[45] This is not unimportant, but for other authors, it is clearly insufficient, since a diagnosis should not only be reliable and transferable but also valid and effective.[6,7,10]

Our model has reduced as much as possible the criterion variance, responsible for the unstable diagnostic reliability between observers that the construction of the ODCs gave rise to,[46] as it provides the psychiatrist with few options for interpretation. The ADCD/IDASD system is answered by the patient, although a psychiatrist helps. After it, any observer can read the content of the answer sheet (see Annex) that has been filled out and make the diagnosis. The system offers few options for imagination. In fact, we took the answers from 10 subjects of the depressed group and 10 from the control group chosen randomly and we asked two psychiatrists to analyze the corresponding sheets of the IDASD. Both reached a *perfect* degree of agreement for both the evaluation of the presence of each item and for the final diagnosis ($\kappa = 1.00$). It was something to be expected since, after all, it was simply a matter of adding up items present in a questionnaire that had been answered.

However, the present investigation did not analyze the inter-interviewer reliability when they independently evaluated the same patient using the ADCD as defined in Table 5, without using the IDASD, to make the diagnosis. The project design was oriented towards the creation of the ADCD/IDASD system and the making of an evaluation of its constructive validity and predictive capacity. Evaluating the reliability between psychiatrists of the ADCD, as defined in Table 5, is therefore a necessary but pending investigation. It would also be desirable to study psychiatrists other than the authors to eliminate biases.

The ADCD/IDASD system diagnoses depression in the same way as the clinical psychiatrists would do and as is done in the ICD-10, with a 0.93 sensitivity and 0.82 general specificity. Its global likelihood of being correct is 94% and it has a more than acceptable kappa diagnostic reliability ($\kappa = 0.76$). The general specificity of the ADCD decreases somewhat because of the symptom controls, because when only the asymptomatic controls are considered, the specificity increases to 0.92 with a greater likelihood of being correct (96%) and an elevated kappa reliability ($\kappa = 0.82$). These values are significant (Table 6).

Some explanation must be found about why the false positives detected by the ADCD/IDASD system are mostly anxiety disorders. Perhaps the reason that some anxious patients answer the ADCD/IDASD system in the same way as the depressed ones is due to the existing similarities between both disorders. The discussion regarding the validity of the separation between anxiety and depressive disorders is not new and is still on-going.[47] Unfortunately, this matter cannot be developed herein. However, the interested reader can obtain a perspective on the current situation of the discussion in the excellent review directed by Vallejo and Gastó.[48] It has also been indicated that pathological anguish participates with the same «endogenous» character of depressions.[49,50] We demonstrated its difference in regards to the common anxiety some years ago.[51] In that research, we found that both depressive and anxiety disorders share the rare/normal adjective pair in their respective discriminant models. And this same pair of adjectives is present as one of the most discriminant in the ADCD. This could justify why some anxiety disorders would have behaved as false positive in this investigation.

However, it is also true that other anxiety disorders with symptoms that were still active were diagnosed by the ADCD/IDASD system correctly, that is, as non-depressed. And this evidence would void the previous reasonings.

These arguments make us think that such false positives were not really false and that the subjects were also depressed. This would speak in favor of some negligence of the investigators when clinically investigating these patients in depth when they included them in the investigation. If they had done so correctly, they would have detected the depression in these patients initially labeled as anxious, and would have had to re-diagnose them of depression, given the hierarchical preeminence of this diagnosis over that of anxiety.

In any event, the authors belong to the group of investigators who consider both disorders as different aspects of the same one. Even more, for them, they are two different moments of evolution of the same disease,[42] so they do not consider this «negligence» so serious. This is even more true now that other authors have changed their opinion and also support the suppression of the diagnostic hierarchical preeminence of depression over anxiety.[52] One reality that also cannot be evaded is that anxious-depressive comorbidity was found in more than 50% of the patients attended in primary care.[53] This moves us to question if all of them really constitute two different disorders.

The construct validity of the ADCD can be considered legitimately satisfactory given that the proportion of the variance explained by the factor analysis (69%) exceed the 50% limit marked by the factor analysts.[40] The same can be stated about their reliability and internal consistency ($\alpha = 0.92$; $R = 0.91$). Unfortunately, we repeat, comparisons cannot be established with the same values obtained by other ODCs since data on them are lacking.

Thus, it seems that the ADCD/IDASD system offers a model and procedure to diagnose depression that is sufficiently

valid and reliable so as to be considered by the investigator and clinical psychiatrists in their daily work.

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Anexo 1

We need you to help us understand how you feel. To do so, we will show you several lines with a series of numbers. Indicate how you have felt during the last two weeks in each section, marking the number that best represents it with a circle.

(Ask your doctor for help filling out this questionnaire if you need it)

For example: Good |1 2 3 4 5 6 7 ⑧ 9 10| Bad (it means quite *bad* to **very bad)**

MOTIVATION or INTEREST for things:	Lack of interest — Intereste 10 9 8 7 6 5 4 3 2 1	
IMPULSE for the activity:	Active — Passive 1 2 3 4 5 6 7 8 9 10	
LIKING or PLEASURE for things:	Bored, serious — Enjoyable, cheerful 10 9 8 7 6 5 4 3 2 1	
DAILY WORK it is...:	Tiring — Mild 10 9 8 7 6 5 4 3 2 1	
State of MOOD:	Fresh, cheerful — Weak, downhearted 1 2 3 4 5 6 7 8 9 10	
ENERGY in the body:	Strong — Weak 1 2 3 4 5 6 7 8 9 10	
(QUALITY) What happens is:	Normal — Rare 1 2 3 4 5 6 7 8 9 10	

Note for the evaluator (do not include on the sheet the patient fills out): With answers from six to ten (including both), each item has a score of one point (between five and one is equal to zero). Write it down in the column on the right. Add up the scores obtained. If the subject reaches a total of four or more points and two of them come *obligatorily* from the last three items (mood, energy and quality), make the diagnosis of **depression**. The criterion of depression is not fulfilled with three points or less or with four points or more if two of them do not come from the three items mentioned (mood, energy and quality).