Psychiatry Research 256 (2017) 312–317

Contents lists available at ScienceDirect

Psychiatry Research

journal homepage: www.elsevier.com/locate/psychres

Screening for generalized anxiety disorder in Spanish primary care centers with the GAD-7

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ARTICLE INFO

Keywords:
Screening
Generalized anxiety disorder
GAD-7
Primary care
Criterion validity
Computerized instruments

ABSTRACT

The aim of the study was to determine the criterion validity of a computerized version of the General Anxiety Disorder-7 (GAD-7) questionnaire to detect general anxiety disorder in Spanish primary care centers. A total of 178 patients completed the GAD-7 and were administered the Composite International Diagnostic Interview (CIDI) for DSM-IV Axis I Disorders, which was used as a reference standard. Sensitivity, specificity, positive and negative predictive values, and positive and negative likelihood ratios were calculated. A cut-off of 10 yielded a sensitivity of .87, a specificity of .78, a positive predictive value of .93, a negative predictive value of .64, a positive likelihood ratio of 3.96 a negative likelihood ratio of .17 and Younden's Index of .65. The GAD-7 performed very well with a cut-off value of 10, the most frequently used cut-off point. Thus, a computerized version of the GAD-7 is an excellent screening tool for detecting general anxiety disorder in Spanish primary care settings.

1. Introduction

Anxiety is the single most common mental disorder in Europe, affecting near 61.5 million people (Wittchen et al., 2011). However, reported prevalence rates for this disorder can vary substantially across countries. According to the European Study of the Epidemiology of Mental Disorders (ESEMeD), which assessed 21,425 21,425 non-institutionalized adults in six different European countries, the lifetime prevalence of any anxiety disorder is 13.6% and the annual prevalence is 4.2% (Alonso et al., 2004). In Spain, by contrast, Haro et al. (2006) assessed a general population sample of 5473 adults, finding that the lifetime prevalence for any anxiety disorder was 9.4%, with a one-year prevalence of 5.7%. These figures are lower than those reported in the United States (US), where lifetime and annual prevalence rates for these disorders have been reported to be 29% and 11%, respectively (n = 9282) (Kessler et al., 2005). However, King et al. (2008) found no differences in the prevalence of anxiety disorders in the United Kingdom (UK) and Spain, the two countries with the highest prevalence rates in Europe. Despite the differences in prevalence rates among countries, there is little doubt that anxiety disorders are highly prevalent in Europe and more needs to be done to improve both detection and treatment.

In Spain, as in many countries, individuals with mental disorders are often first identified in primary care (PC) centers. A study involving 7936 PC patients in Spain found that 53.6% of the sample presented one or more mental disorders, with nearly 30% of the patients in that study presenting comorbidities and 11.5% suffering from concurrent affective, anxiety and somatoform disorders (Roca et al., 2009).

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http://dx.doi.org/10.1016/j.psychres.2017.06.023
Received 13 January 2017; Received in revised form 30 April 2017; Accepted 10 June 2017
Available online 12 June 2017

Although anxiety disorders were only the third most common in that study (after affective and somatoform disorders), these still accounted for 25.6% of all mental disorders. The most common types of anxiety disorders were as follows: generalized anxiety disorder (GAD; 11.7%), panic disorder (PD; 9.7%), social phobia (.4%), and post-traumatic stress disorder (.3%). Another study (Serrano-Blanco et al., 2010) recruited 3815 patients from 77 different PC centers in Spain, finding a lifetime prevalence of 20.8% and an annual prevalence of 18.5% for any anxiety disorder. These prevalence rates are largely in line with those reported in other European countries (Alonso et al., 2004; Ansseau et al., 2004; Kroenke et al., 2007; Wittchen et al., 2002), and as Kessler (2007) observed, any differences are more likely to be due to methodological issues rather than cultural differences.

Of all the various types of anxiety disorders, GAD is the most common in PC settings (Wittchen, 2002). According to García-Campayo et al. (2012a), GAD is highly comorbid with other psychological disorders in PC patients in Spain (n = 2232), as follows: social anxiety (37%), depression (19.1%), phobia (14%), PD (10.7%), and obsessive-compulsive disorder (8%). Physical comorbidities are also common, including chronic pain (83.9%), gastrointestinal disorders (34%), cardiovascular diseases (17.3%), and diabetes (14%). As these findings show, GAD can have a large impact on the patient's physical status and, consequently, on other aspects of life. In addition, in that study, patients with GAD reported poor quality sleep and high sleep-onset latency, with only 16.2% of participants reporting restful sleep. Moreover, GAD can negatively impact quality of life and may lead to disability (Alonso et al., 2004; Rapaport et al., 2005), high absenteeism rates from work, and an increase in the use of health services. As a result, GAD is associated with enormous treatment-related expenses and costs associated with loss of productivity (Rovira et al., 2012). Like other common mental disorders in PC patients, anxiety disorders have become more common in Spain due to the ongoing economic crisis (Gili et al., 2013). Additionally, in many cases, the diagnosis of GAD in PC is incorrect or non-existent, with misdiagnosis rates as high as 71% (Fernández et al., 2010). For this reason, valid tools are needed to efficiently detect this disorder.

The 7-item GAD scale (GAD-7) is one of the tests used in the PC setting to detect the presence of GAD. The GAD-7 is the anxiety module of the Patient Health Questionnaire (PHQ), a screening test for mental disorders in PC (Spitzer et al., 1999) that is used to detect and measure GAD as well as other anxiety disorders. The original PHQ developed by Spitzer et al. (1999) had a moderate sensitivity of .63 and a good specificity of .97 for any anxiety disorder (using a cut-off score of 8 points). The Spanish version of the PHQ includes the GAD-7 with a 3-point scale as in the original version (Diez-Quevedo et al., 2001), and the operating characteristics of the Spanish version also had a moderate sensitivity (.69) and good specificity (.99).

In a later study (Spitzer et al., 2006), the authors developed a version of the GAD-7 that used a 4-point scale, reporting that a cut-off score of 10 or more was the best indicator for anxiety disorders (sensitivity, .89; specificity, .82). García-Campayo et al. (2010) subsequently developed and validated the Spanish version of the GAD-7, which—unlike the PHQ version developed by Diez-Quevedo et al. (2001)—used a 4-point response scale, similar to the original English-language version of Spitzer et al. (2006). This validated version was found to possess excellent psychometric properties (sensitivity, .87; specificity, .93)—similar to the original version—using a cut-off score of 10 for diagnosis. Feasibility and reliability were also excellent and the scale was shown to be one-dimensional through factor analysis, with an explained variance of 72%. Moreover, this version of the scale has been validated to measure disability in Spanish PC patients with GAD (Ruiz et al., 2011).

However, the predictive value of this scale has not yet been compared to a gold standard such as a clinical interview performed by a mental health professional. Indeed, using a computerized version of the GAD-7 in PC centers may be also useful. Given this context, the main aim of the present study was to study the criterion validity of a computerized version of the Spanish GAD-7 in a sample of PC patients in Spain who had been previously identified by a primary care physician (PCP) as suffering from anxiety or other emotional disorders.

2. Method

We studied the screening test characteristics (criterion validity) of a computerized version of the Spanish GAD-7 to detect GAD in users of PC services. These findings were then compared to the results with the Composite International Diagnostic Interview (CIDI), a diagnostic interview developed by the World Health Organization (WHO, 1990), which was used as the reference standard.

2.1. Study population

2.1.1. Setting

The study was conducted from January 2014 to December 2014. The study sample included PC patients aged 18–65 years old. From among the 14 PC centers of the public health system involved in the PsicAP study until this date (Cano-Vindel - et al., 2016), we selected five centers from different cities of Spain (two in Valencia and one each in Albacete, Vizcaya and Mallorca) to recruit the sample. The ethics committees of each center, the National Ethics Committee, and the Spanish Agency of Medicines and Medical Devices (AEMPS), all approved the study protocol (code: ISRCTN58437086). These centers were selected for the present study because they were the first five centers approved by the ethics committee.

2.1.2. Participants

In Spain, all public health system users are assigned to a PCP who specializes in community and family medicine. PC is the gateway to the healthcare system for all patients and acts as a bridge between other services. All patients who attended PC centers with somatic or psychological complaints were contacted and invited to participate in the study. A total of 298 participants were recruited from February 2014 to December 2014 by PCPs from five of the 14 PC centers participating in the PsicAP Project. A total of 260 participants voluntarily agreed to participate, gave their informed consent, and completed the PHQ. Thirty-eight participants were excluded for the following reasons: not reachable (twenty patients; 6.7%); failing to meet the age range criteria (nine patients; 3%); dropped out (six patients; 2%); and excluded for other reasons (three patients; 1%). Most patients were recruited from the two PC centers located in Valencia, with the remaining participants recruited from the centers in Albacete, Mallorca, and Vizcaya. After all the patients completed the PHQ and other registration procedures, they were asked to participate in the sub-study. Then, the CIDI was administered by trained psychologists to the 178 participants who voluntarily agreed to take this test. Socio-demographic variables for the entire sample and for the subset of participants who completed the CIDI interview were similar (as indicated by *t*-tests or chi-squared tests, depending on variable type; all $p \geq .35$). Among the five participating PC centers, the dropout rate was slightly higher at the center in Vizcaya ($p < .05$). Table 1 shows the socio-demographic variables and medications administered.

2.2. Measurement instruments

2.2.1. Patient Health Questionnaire (PHQ)

The PHQ is a self-report screening test derived from the PRIME-MD test (Spitzer et al., 1999). It is a two-stage system, containing the Patient Questionnaire and the Physicians' Clinical Evaluation Guide, used to evaluate mental disorders in the PC setting. The PHQ includes modules to assess somatization (PHQ-15), depressive disorder (PHQ-9), PD (PHQ-PD), GAD (GAD-7), eating disorders and alcohol-related disorders.

Table 1
Demographics.

	Total sample (n = 260)		CIDI completed (n = 178)	
	n	%	n	%
Primary Care Center				
Albacete	39	15.0	21	11.8
Mallorca	33	12.7	30	16.9
Valencia	155	59.6	122	68.5
Vizcaya	33	12.7	5	2.8
Sex				
Female	186	71.5	125	70.2
Male	74	28.5	53	29.8
Marital status				
Married	130	50.0	86	48.3
Divorced	28	10.8	21	11.8
Widowed	5	1.9	3	1.7
Separated	19	7.3	14	7.9
Never married	48	18.5	29	16.3
Unmarried	30	11.5	25	14.0
Level of education				
No schooling	7	2.7	4	2.2
Basic education	94	36.2	71	39.9
Secondary education	40	15.4	27	15.2
High School	64	24.6	46	25.8
Bachelor	47	18.1	27	15.2
Master/doctorate	8	3.1	3	1.7
Employment situation				
Part-time employee	28	10.8	18	10.1
Employed full time	85	32.7	58	32.6
Unemployed, in search of work	77	29.6	52	29.2
Unemployed, not looking for work	36	13.8	27	15.2
Temporary low labor	14	5.4	11	6.2
Permanent low labor	4	1.5	2	1.1
Retired	16	6.2	10	5.6
Income level				
Less than 12,000 euros	119	45.8	87	48.9
12,000 euros to 24,000 euros	112	43.1	79	44.4
Between 24,000 euros and 36,000 euros	20	7.7	10	5.6
More than 36,000 euros	9	3.5	2	1.1

2.2.2. Generalized anxiety disorder-7 (GAD-7)

The PHQ includes the GAD-7 (items 5a-5 g of the questionnaire). This module is used to screen for the GAD symptoms described in the DSM-IV over the last four weeks, as follows: (5a) jitters; (5b) excessive restlessness; (5c) fatigue; (5d) muscular pain or tension; (5e) sleeping problems; (5 f) attention problems and (5 g) easy irritability. As this version, the Spanish version of the PHQ (Diez-Quevedo, 2001) includes a 3-point response scale ranging from 0 (“not at all”) to 1 (“several days”) and 2 (“more than half the days”) and requires an algorithm for GAD with a response of “more than half the days” on item 5a and also on three or more of items 5b-g. As in the original English (Spitzer et al., 2006), the Spanish version of the GAD- 7 validated by García-Campayo et al. (2010) includes a 4-point response scale ranging from 0 (“never”) to 1 (“several days”), 2 (“more than half the days”) and 3 (“nearly every day”) over the last two weeks, providing a total score that ranges from 0 to 21. According to Spitzer et al. (2006), the total score can be classified into four degrees of severity: minimum (0 − 4), mild (5 − 9), moderate (10 − 14) and severe (15 − 21). The validated Spanish version (García-Campayo et al., 2010) uses the same classification system, which thus differs slightly from the original PHQ. Using a cut-off of 10 points, the reported sensitivity and specificity of the original English version is .89 and .82, respectively, whereas the corresponding values on the Spanish version validated by García-Campayo et al. (2010) are .86 and .93, respectively. In the present study, we used this latest version (García-Campayo et al., 2010) rather than the older GAD-7 version included in the PHQ (Diez-Quevedo et al., 2001).

2.2.3. Composite International Diagnostic Interview (CIDI)

The CIDI is a structured interview for psychiatric disorders following the DSM-IV (APA, 2000) and CIE-10 (WHO, 1990) criteria. The GAD module of the CIDI (Spanish version) was used for diagnosis (OMS, 1997).

2.3. Procedure

Patients with anxious, depressive or physical symptoms without a clear biological basis were invited to participate in the study by their PCP. All participants completed the Patient Information Sheet and provided informed consent. Once signed, a new meeting was arranged during which patients were again provided with details about the study; during this same meeting, the participants completed a computerized version of the PHQ and other measurement instruments. A dedicated personal computer was brought to the PC consultation and connected wirelessly to internet. Participants were then instructed to connect to the study website to take the test, which had been previously programmed to collect all data in computerized form. Participants completed all the PHQ and GAD-7 items by clicking on answers on screen. All items for each sub-module of the PHQ and the GAD-7 appeared together on the screen. Participants were permitted to correct their answers if they so desired. If any item was not answered, the program providing a warning, reminding participants to complete all items as they were required to answer all of the questions.

Next, participants were scheduled to take the CIDI. All participants received the Patient Information Sheet and after signing the informed consent, were interviewed by a trained psychologist who was blinded to the GAD-7 results. All psychologists (7 in total) that performed the clinical interviews were trained by a senior clinical psychologist through online sessions.

2.4. Statistical analysis

To obtain the criterion validity of the GAD-7, a ROC curve analysis was performed: the following values were calculated based on the scoring criteria: sensitivity (which measures the proportion of positive results correctly identified as such), specificity (which measures the proportion of negative results correctly identified as such), positive and negative predictive values (the proportions of positive and negative test results that are, respectively, true positive and true negative results), and positive and negative likelihood ratios (used to assess the value of performing the diagnostic test). The internal consistency of the GAD-7 was assessed with Cronbach's α and McDonald's ω, both of which showed satisfactory indexes in the current sample (Cronbach's α = 83; McDonald's ω = .84). The optimal cut-off value (defined as a balance between sensitivity and specificity) was identified as the value corresponding to the maximum value of Youden's index, calculated as (sensitivity + specificity– 1).

3. Results

3.1. PHQ results

As Table 2 shows, of the 260 patients that completed the PHQ, a large proportion (n = 203; 78%) were diagnosed with major depressive disorder (MDD) according to PHQ-9 criteria (scores ≥ 10) and the DSM-IV diagnostic algorithm (n = 178; 68%). Approximately half of all patients (n = 141; 54%) were diagnosed with somatization disorder (SD) (PHQ-15 ≥ 5) and more than two-thirds (n = 180; 69%) were diagnosed with GAD (GAD-7 ≥ 10). In addition, comorbidity among disorders was high (n = 150; 58%), particularly between GAD and MDD; in addition, nearly half of patients (n = 117; 45%) with GAD had comorbid SD, while a similar proportion (n = 104; 40%) presented concurrent GAD, SD and MDD (see Table 2).

Table 2
PHQ diagnoses and comorbidity.

	Total sample (n = 260)		CIDI completed (n = 178)	
	n	%	n	%
Somatoform disorder (SD)				
SD (≤ 5)	141	54.2	94	52.8
Major depressive disorder (MDD)				
MDD (Algorithm)	178	68.5	124	69.7
MDD (≤ 10)	203	78.1	138	77.5
Panic disorder (PD)				
PD (Original Algorithm)[a]	57	21.9	40	22.5
PD (Modified Algorithm)[b]	110	42.3	74	41.6
General anxiety disorder (GAD)				
GAD (≤ 10)	180	69.2	128	71.9
Eating disorder				
(PHQ Algorithm)	45	17.3	30	16.9
Alcohol abuse				
(PHQ Algorithm)	38	14.6	25	14.0
Comorbidity				
MDD + GAD	150	57.7	107	60.1
MDD + SD	115	44.2	81	45.5
GAD + SD	117	45.0	81	45.5
MDD + GAD + SD	104	40.0	74	41.6
GAD + PD	45	17.3	33	18.5
MDD + PD	40	15.4	30	16.9
MDD + GAD + PD	37	14.2	29	16.3
PD + SD	42	16.2	27	15.2
SD + GAD + PD	36	13.8	25	14.0
MDD + SD + PD	34	13.1	23	12.9
SD + MDD + PD + GAD	32	12.3	22	12.4
SD + MDD + PD + GAD+ Eating + Alcohol	1	.4	1	.3

Note. SD = somatoform disorder, MDD = major depressive disorder, PD = panic disorder, GAD = general anxiety disorder, Eating = eating disorder, Alcohol = alcohol abuse. Comorbidity categories are not exclusive (e.g., "MDD + GAD" comprises "MDD + GAD + SD").

[a] Original Algorithm: All of the first four questions are answered with "yes," and presence of four or more somatic symptoms during an anxiety attack.

[b] Modified Algorithm: At least two of the first four questions are answered with "yes," other coding criteria unchanged. (see Muñoz-Navarro et al., 2016).

3.2. Diagnosis using CIDI

When the prevalence of GAD was measured with the CIDI GAD module, one hundred and thirty-seven (77%) of the 178 patients had a positive diagnosis. Thirty-six patients (20.2%) were diagnosed with concurrent GAD, MDD and PD, one hundred and thirteen patients (63.5%) were diagnosed with MDD alone, and forty-six patients (25.8%) with PD alone.

3.3. Operating characteristics of GAD-7 as a screening test

A ROC curve analysis of the GAD-7 showed that the test performed well, with an area under the curve of .86 (Fig. 1). A cut-off of 10 yielded the best test characteristics for GAD: sensitivity, .87; specificity, .74; positive and negative predictive values of .93 and .64, respectively; and positive and negative likelihood ratios of 3.96 and .17, respectively. This cut-off also yielded the best Younden's index (J = .65). Of the patients with a GAD CIDI diagnosis, 86% had a score ≥ 10, while 78% of patients without a GAD diagnosis scored below this cut-off value. The discriminating statistics for different possible cut-off values are shown in Table 3.

4. Discussion

The results reported here support the value of a computerized version of the validated Spanish version of the GAD-7 as a diagnostic tool for GAD among patients at Spanish PC centers. The screening test

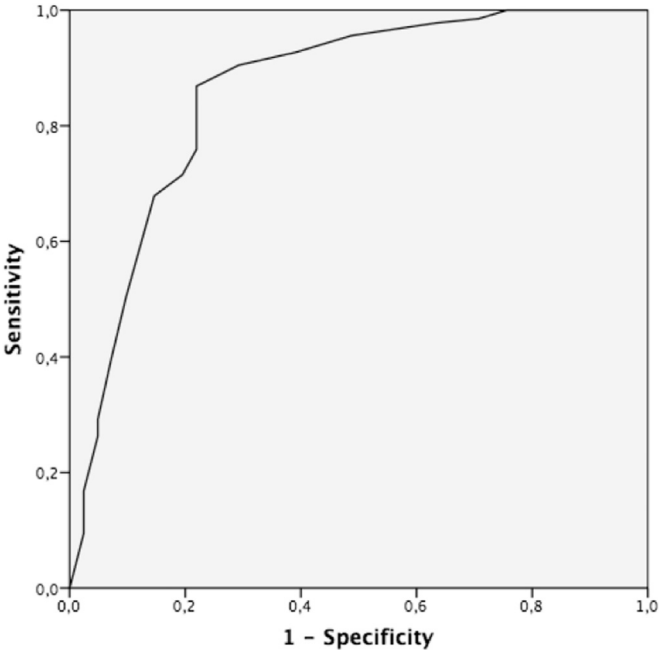

Fig. 1. GAD-7 ROC curve.

characteristics were consistent with those described previously by Spitzer et al. (2006) and García-Campayo et al. (2010). Unlike the validation of the Spanish version of the GAD-7, our results are supported by a clinical interview as a gold standard, which is the major strength of our study.

In line with Spitzer et al. (2006), both the sensitivity (.87) and specificity (.74) were high when a cut-off score of 10 was used. Compared to the GAD-7 version by García-Campayo et al. (2010), we found an identical sensitivity but a lower specificity. By contrast, the older Spanish version of the GAD-7 (Diez-Quevedo et al., 2001), had a lower sensitivity (.69) but higher specificity (.99). Moreover, our results were better than the initial results reported by Spitzer et al. (1999) when the PHQ anxiety disorder module was first developed; in that study, the sensitivity was only .63 although the specificity was .97. Nevertheless, it is plausible that these differences may be explained by the non-comparable samples. For example, the original Spanish version of the GAD-7 by Diez-Quevedo et al. (2001) was conducted in a sample of hospital inpatients. By contrast, our sample consisted of PC patients. Yet, our results validate the utility of the GAD-7 in the PC setting.

At a cut-off score of 10, the positive predictive value was quite high, indicating that only 7% of positive cases would not be detected in our sample of patients with emotional disorders. This finding is similar to that reported by García-Campayo et al. (2010) but better than values reported by Spitzer et al. (2006), who found a positive predictive value of only 29%. Nevertheless, we found a low negative predictive value, indicating that 36% of GAD cases would not be detected correctly; as a result, the number of false-positives was high. Overall, our results demonstrate that the GAD-7 is highly sensitive with a high predictive value for positive cases but is limited in terms of its specificity and negative predictive value. In general, we found that a high prevalence of GAD (nearly 72%) among the patients evaluated in our sample, a finding that was expected given that the PCPs referred these patients to our clinical trial after medical diagnosis.

When comparing the confusion matrix to the gold standard interview, the specificity is the same (.78) for cut-off scores of 10 and 11, with nine false-positive cases and thirty-two true negative cases. Sensitivity was better at a cut-off score of 10 (one hundred nineteen true positive cases and eighteen false negative cases) compared to a cut-off of eleven (one hundred and four true positives and thirty-three false negatives). These data support the decision to select the cut-off score of

Table 3
Operational characteristics of the GAD-7.

Cut-off Score	True Positives	False Negatives	False Positives	True Negatives	Sensitivity	Specificity	Positive Predictive value	Negative Predictive value	Positive Likelihood ratio	Negative Likelihood ratio	Youden's Index (J)
GAD-7 ≥ 8	127	10	16	25	.93 (.87 – .96)	.61 (.46 – .74)	.89	.71	2.38 (1.62 – 3.50)	.12 (.06 – .23)	.54
GAD-7 ≥ 9	124	13	12	29	.91 (.84 – .94)	.71 (.56 – .82)	.91	.69	3.09 (1.92 – 4.99)	.13 (.08 – .23)	.62
GAD-7 ≥ 10	119	18	9	32	.87 (.80 – .92)	.78 (.63 – .88)	.93	.64	3.96 (2.21 – 7.07)	.17 (.11 – .27)	.65
GAD-7 ≥ 11	104	33	9	32	.76 (.68 – .82)	.78 (.63 – .88)	.92	.49	3.46 (1.93 – 6.21)	.31 (.22 – .43)	.54
GAD-7 ≥ 12	98	39	8	33	.72 (.63 – .78)	.80 (.66 – .90)	.92	.46	3.67 (1.95 – 6.89)	.35 (.26 – .48)	.52
GAD-7 ≥ 13	93	44	6	35	.68 (.60 – .75)	.85 (.72 – .93)	.94	.44	4.64 (2.19 – 9.80)	.38 (.29 – .50)	.53
GAD-7 ≥ 14	81	56	5	36	.59 (.51 – .67)	.88 (.74 – .95)	.94	.39	4.85 (2.11 – 11.15)	.47 (.37 – .59)	.47

10 as the most appropriate cut-off point. Moreover, the Youden's index with this cut-off score was .65, confirming that this cut point offers a better balance between sensitivity and specificity.

The number of false-negatives in our sample was relatively low, leading us to conclude that the GAD-7 has a good sensitivity with a high predictive value. However, there were a large number of false-positives given that the PHQ did not confirm the CIDI diagnosis of GAD in many cases. This finding means that the specificity was only moderate, which can be explained by the fact that our sample was taken from PCP referrals of patients suffering from several emotional disorders (such as anxiety, depression or somatization). In addition, comorbidity was highly prevalent in our sample, although patients without GAD diagnoses may also report anxiety symptoms. Thus, any self report used in this context will show low specificity. Notwithstanding the moderate specificity, this study of the GAD-7 in this PC sample offers ecological validity for PC settings, which is important given the time constraints and scarcity of resources in this setting, as well as the high prevalence of several comorbid conditions, both mental and physical. Thus, the use of the GAD-7 may be helpful to detect GAD in this setting due its high sensitivity.

The positive likelihood ratio found in this work suggests that the test works very well for GAD: the disorder was detected in approximately 4 patients for every patient without the disorder (4:1). The negative likelihood ratio was even better, with negative cases detected 6 times more often in healthy patients than in GAD patients (6:1).

To improve the detection and diagnosis of GAD in Spanish PC centers, the PCP could use the GAD-7 or the GAD-2, an ultra-short version of the GAD-2 containing only the two central items from the GAD-7 and which has also been found to have appropriate psychometric properties (García-Campayo et al., 2012b). If the GAD-2 is positive, then the GAD-7 could be administered to confirm the diagnosis. However, although our results indicate that the GAD-7—given its high sensitivity and positive predictive values—is a reliable and relatively accurate test for detecting GAD, the test still yields a large number of false positives (due to its low specificity and negative predictive value). For this reason, other measures should be performed to confirm the GAD-7 diagnosis and to rule out potential false positives. Thus, when necessary, this test could be followed by the full PHQ (Diez-Quevedo et al., 2001) to more accurately assess the presence of GAD with comorbidities. The next diagnostic step could involve administration of the CIDI GAD module by a clinical psychologist to make a final diagnosis and to refer the patient to the appropriate psychological treatment at the PC center or a specialized treatment center.

4.1. Study limitations

As described above, participants completed a computerized version of the self-report measures. The use of an electronic questionnaire requires participants to be familiar with the use of a computer, and this is potentially an additional barrier for the correct administration of this test, especially in older people, particularly given that elderly people have been reported to have difficulties in understanding the GAD-7 (García-Campayo et al., 2010). In addition, considering the large number of false positives, it is possible that some participants exaggerated their answers, which could have affected the specificity of the GAD-7 results. Another possible limitation is that PC service users are often a highly heterogeneous group and the sample size was not large. However, this potential limitation may have been minimized by the fact that a criterion standard diagnostic interview for anxiety was used to ensure the reliability of our results.

4.2. Conclusions

This is the first time that the criterion validity of the Spanish version of the GAD-7 (computerized) has been compared to a clinical interview used as a gold standard. Our results show that this computerized version of the GAD-7 is a highly valuable tool for diagnosing GAD among patients at Spanish PC centers. The screening test characteristics were good and largely consistent with previous reports. We conclude that the GAD-7 can be used with confidence as an initial screening tool at PC centers due to its strong ecological validity. However, given the large number of false-positives, the diagnosis should be confirmed by other instruments—including the full PHQ and/or the CIDI GAD module—before referring patients for specialized treatment.

Acknowledgments

We thank all the PsicAP Research Group who kindly participated in this large project. This work was supported by Ministerio de Economía y Competitividad; Psicofundación, Psicofundación, Foundation for the Scientific and Professional Development of Psychology in Spain and Fundación Mutua Madrileña. We also thank Bradley Londres for his assistance in editing and improving the manuscript.

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