Spanish adaptation of the Seasonal Pattern Assessment Questionnaire (SPAQ) in the adult and children-adolescent versions

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Adaptación española del Cuestionario de Evaluación de Perfil Estacional **(Seasonal Pattern Assessment Questionnaire,** ***SPAQ*****)** ***en las versiones de adultos e infanto-juvenil***

Summary

Introduction. *In 1984, Rosenthal et al. described the seasonal affective disorder as a cyclic pattern of depressive episodes appearing in autumn and winter, showing atypical symptoms as hypersomnia, overeating, and carbohydrate craving. They also introduced the self-applied Seasonal Pattern Assessment Questionnaire, which includes a seasonality index. A children and adolescent version was also introduced later too. In this paper the test retest reliability and internal consistency of both the adult and the children and adolescent SPQA version are presented.*

Methods: *30 adults y 30 adolescents filled out the corresponding questionnaires in an interval of one week. Kappa and intraclass correlation coefficients were applied. Internal consistency was measured with Cronbach alpha.*

Results. *The adult version obtained coefficients between 0.47 y 0.81, and a Cronbach alpha of 0.85 for the seasonality index. The children and adolescent version included several items with low reliability, which were then rewritten. The renewed version was tested again in a new 30 subjects sample. Coefficients ranged from 0.50 to 0.83, with a Cronbach's alpha of 0.69 for the seasonality index.*

Conclusions. *The Spanish version of the SPAQ (Both Adult and Children-Adolescent) showed good reliability values and also appropriate internal consistency coefficients. Therefore, they are ready to be used in clinical and epidemiological research.*

Key words: *Seasonal. Affective. Questionnaire.*

Resumen

Introducción. *En 1984, Rosenthal et al. describieron el trastorno afectivo estacional como un patrón cíclico de episodios depresivos con criterios de depresión mayor que aparecían en el período de otoño-invierno y que tendían a presentarse con síntomas atípicos, como hipersomnia, hiperfagia y apetencia por hidratos de carbono. También diseñaron una escala autoaplicada para medir la estacionalidad, la SPAQ* (Seasonal Pattern Assessment Questionnaire), *con una versión para población infanto-juvenil. En este trabajo se presenta la adaptación española de ambas escalas, su fiabilidad y consistencia interna.*

Métodos. *Treinta adultos y 30 adolescentes rellenaron los cuestionarios respectivos en un intervalo de una semana, aplicándose los coeficientes kappa e intraclase. La consistencia interna se calibró con el alfa de Cronbach.*

Resultados. *La versión de adultos obtuvo unos coeficientes entre 0,47 y 0,81, con un alfa de 0,85 para el índice de estacionalidad. En la versión de adolescentes se hallaron tres ítems con baja fiabilidad, lo que sugirió nuevos redactados. La renovada escala para población infanto-juvenil se evaluó en una nueva muestra de 30 sujetos y obtuvo unos coeficientes entre 0,50 y 0,83, con un alfa de 0,69 para el índice de estacionalidad.*

Conclusiones. *La versión española del Cuestionario de Evaluación de Estacionalidad presenta valores adecuados de fiabilidad y consistencia interna para su uso en investigación epidemiológica y clínica.*

Palabras clave: *Estacional. Afectivo. Cuestionario.*

INTRODUCTION

That the mood state depends on many biological-psychological-social variables is something that few doubt at present. When we speak about biological variables, we not only refer to changes regarding neurochemical idiosyncrasy of each individual but also to the influence of other variables such as environmental, including atmospheric ones. Among them, the influence of the seasons

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of the year is one that is more recognized, both historically as well as probably from the popular culture. However, this knowledge has not acquired scientific rigour until recently.

In 1984, Rosenthal et al. described the Seasonal Affective Disorder (SAD) as a cyclic pattern of depressive episodes with major depression criteria that appeared in the fall-winter period and created a series of operative criteria to define it[1]. Rosenthal described that these depressions tended to occur with atypical symptoms, that is, hypersomnia, overeating, and carbohydrate craving. These patients seem to be especially sensitive to changes in climate and latitude, and phototherapy seemed to be efficient. Rosenthal provided evidence of the validity of this syndrome based on a characteristic course, on clinical and demographic features and on the response to a specific treatment.

Afterwards, this evidence was replicated by other work groups[2]. The opposite seasonal pattern has also been described, that is, that of summer depression, as well as the pattern of the combination of two depressions, one summer and another winter per year. Later on, Kasper defined the Subsyndromic Seasonal Affective Disorder (S-SAD) as a milder form of the seasonal affective disorder that did not comply with the major depression criteria[4].

The Seasonal Affective Disorder is not included as a clinical entity in the present classifications being used (please read DSM-IV[4] and ICD-10[5]) although the seasonal pattern is used as a modifier of both uni- as well as bipolar affective disorders, a postscript that indicates that a certain affective disorder presents with the cyclicity corresponding to the seasonal cycle.

The prevalence studies present somewhat discordant results. The known epidemiological studies performed by Kasper[3] suggest that the SAD (winter or summer) affects about 5% of the population, reaching 13.5% in the case of S-SAD. The prevalence results of later studies have been discordant, and some authors have recently suggested that the SAD is probably not so prevalent[6] and that the use of the Seasonal Pattern Assessment Questionnaire (SPAQ, Rosenthal et al., 1987), developed as a screening instrument, but used in the Kasper study as a diagnostic instrument, may have shown higher values than the real ones.

In addition to the fact that the major affective disorders may have a seasonal presentation, there is a population, probably considerable, of persons who suffer seasonal emotional variations that do not reach the entity of a major affective disorder and which, on many occasions, do not even reach the medical consultation. This is a trait that can be considered to have genetic transmission and that we could call seasonality. It can be established on the basis of the present knowledge that seasonality is a dimensional factor. On one extreme of seasonality, we would find the patients whose emotional variations, both those of severe intensity (recurrent depressive disorder, with melancholic characteristics) as well as mild one (S-SAD), would follow a seasonal pattern, almost independent of other factors, such as environment stressors. The other extreme of the dimension would be made up by those persons whose mood state variations (considerable or null) do not have the least relationship with the seasonal ones.

Measurement of seasonality: the SPAQ

Rosenthal et al. designed a scale to measure seasonality, that is, the changes in mood and behavior based on the seasons: the SPAQ (Seasonal Pattern Assessment Questionnaire, 1987). There is also a second version for use in the children-adolescent population. This is a self-administrable scale, that is made up of five parts. The second part is formed by six items that measure seasonal variations of mood state, appetite, weight, sleep duration, energy and social activity of the surveyed person, shaping the Seasonality Score Index (SSI), which is the central part of the questionnaire. Each item is scored on a 5 point scale that goes from 0 (without changes) to 4 (extremely marked changes). Thus, the total score can vary from 0 to 24. Other parts evaluate, for example, the degree in which the seasonal changes are lived as problematic and in what month of the year the subject feels better or worse. In this way, a «global seasonality score» is recorded in form of absent, mild, moderate, elevated, serious and incapacitating.

The SSI test-retest reliability has been shown to be quite good[7-11]. The period up to retest was one year in the Thompson[7] study ($r = 0.79$) and 17 months in that of Marriot[9] ($r = 0.58$). Raheja et al.[12] performed a retest after 5 to 8 years, obtaining some results with which they are more critical ($r = 0.62$).

The Magnusson et al.[13] group studied internal consistency of the SPAQ, obtaining good internal consistency of the 6 SSI items (Cronbach's alpha of 0.82). That is, these data indicate that the index is well constructed and that the 6 items are coherent and act synergically to measure the concept. Given that this analysis was based on a large number of questionnaires randomly administered in a general population, it is concluded that the instrument can be generalized, that is, that the seasonal changes in sleep, social activity, mood, appetite, and energy tend to coexist in the general population.

Magnusson[14] also carried out the study to validate the SPAQ in Iceland. The results of his study indicated that the SPAQ had elevated sensitivity and specificity for winter problems, but did not differentiate the SAD and S-SAD well, that is, it is not a good instrument to measure intensity of the symptoms, its retrospective character probably being responsible for most of the bias. On the other hand, the SPAQ presents good external validity or generalizability (the sample was obtained from the general population).

Practically no prospective studies were performed until the second half of the decade of the 90's. Nayyar and Cochrane[15] measured seasonal fluctuations in mood and behavior prospectively, interviewing 25 women monthly

for one year, and administering the SPAQ at the end of the year. The results indicated that the SPAQ and mood registries performed monthly correlated with greater intensity of depressive symptoms in winter, however the retrospective registry of the SPAQ exaggerated the difference between winter and summer.

Originally, the SPAQ was designed and used as a first line screening instrument, and the individuals who were identified as more seasonal were interviewed after the diagnosis was established. However, use of the SPAQ was progressively extended and applied in several epidemiological studies on the SAD and the S-SAD, even before it was validated for this objective. The Kasper criteria were mainly used for this, and a score of 11 or more on the SSI, plus a global score of at least «moderate» were required for the diagnosis of SAD. Keeping in mind the already mentioned data that indicate the scarce reliability of the retrospective assessments of the SPAQ in regards to the intensity of the symptoms, the variable evolution of the patients diagnosed of SAD studied in prospective studies (in the Raheja et al. study[12], only half maintained the SAD pattern, one third evolved as major depressive disorder without seasonal pattern and the rest presented complete remissions or subsyndromic symptoms), and that the SPAQ does not define a time band in the questionnaire (it is assumed that the person surveyed is answering about their entire life), the SPAQ does not seem to be the best instrument to diagnose SAD, as has been demonstrated by the low specificity and predictive value found in recent studies[16]. The British group of Thompson et al.[6] has proposed another scale, the Seasonal Health Questionnaire (SHQ) in order to obtain greater validity for the diagnosis of seasonal affective disorder. This instrument is longer and more difficult to fill out; in addition, it does not detect S-SAD since the first questions require that the person has suffered a major depressive episode in the last 10 years to be able to continue with the questionnaire, but it is more specific than the SPAQ.

However, the SPAQ continues to be an instrument with good internal consistency, easy to administer, adequate for general population samples, and that measures seasonality construct reliability.

PATIENTS AND METHODS

The need to have an instrument available in order to advance in the research and understanding of the influence of seasonal cycles on affective disorders was considered. Thus, we took on the task of adapting and validating the SPAQ, being aware of its limitations, but also of its utility. Although the scale has been used in many languages, we were not aware of any Spanish version and we contacted Dr. Norman Rosenthal, the author of the original scale, to know if any version in Spanish had been promoted, and if there was none, to request permission to adapt it. Once the latter was obtained and under the supposition that a self-adminsterable scale must be understandable, have high validity and test-retest reliability, as well as good sensitivity to change and high specificity, the work was designed in several phases:

1. In the first one, the questionnaire was translated from English to Spanish, with a back translation that did not generate additional problems and then, the validation phase was strictly done.
2. In a second stage, two samples were used, one adult and another adolescents. The first one was made up of 32 persons of both genders, with a mean age of 39 years in the case of women and 41 in the men. All these persons had the fact that they worked in the same center in common, although they occupied different posts and had very varied academic qualifications. Those persons who were under treatment for anxiety or depression were excluded from the study. The adolescent sample was made up of 33 young persons from 14 to 19 years, both men as well as women. All of them participated in competitive sports.
3. In a third stage, after the initial results, changes were introduced into the SPAQ for adolescents (the adult version had obtained adequate values) and the reliability of the modified questionnaire was reassessed. To do so, a third sample of 30 persons, 20 women and 10 men, with a mean age of 17 ± 1.9 years was used. All of them were voluntary students enrolled from a secondary education center.

The data gathered were processed with the Statview and SPSS programs.

The test-retest reliability was verified on re-administering the scales after one week without previous notice. The statistics used to measure the reliability were the interclass correlation coefficient in the question variables and the Kappa coefficient in the categorial ones. In both versions, the responses by months were grouped by seasons to facilitate their validation.

Internal consistence was determined by Cronbach's alpha coefficient. The design of the present study does not include examining the external validity of the test with patients affected. However, this aspect is the best studied in the original versions in English and other translations, while, on the other hand, it is essential to know the reliability and consistency of the Spanish version before it is applied.

RESULTS

In regards to the adult scale (table 1), the reliability of the different items was acceptable. In the first section, reliability measured with the kappa coefficient ranged from 0.475 to 0.78. The second section, that is the SSI (Seasonality Score Index) obtained a better global reliability of 0.795, with values that ranged from 0.626 to 0.812 according to the items, and with a more than acceptable internal consistency (alpha: 0.849). The third

TABLE 1. Reliability (test-retest) and Internal Consistence SPQA adult version

SPAQ (Seasonal Pattern Assessment Questionnaire)		
	Kappa coefficient	
You feel best	0.748	
You tend to gain weight	0.782	
You socialize most	0.766	
You sleep least	0.475	
You eat most	0.664	
You lose most weight	0.505	
You socialize least	0.567	
You feel worst	0.681	
You eat least	0.681	
You sleep most	0.780	
	Interclass correlation coefficient	
Sleep length	0.812	*Alpha coefficient* 0.849
Social activity	0.780	
Mood (feeling of well being)	0.746	
Weight	0.717	
Appetite	0.626	
Energy level	0.775	
Sum Seasonality	0.795	
	Kappa coefficient	
The seasonal changes are a problem	0.520	
	Coefficient correlation intraclass	
Degree of involvement	0.779	
How much has your weight fluctuated during the year?	0.971	
How many hours do you sleep in winter?	0.849	
How many hours do you sleep in spring?	0.853	
How many hours do you sleep in summer?	0.883	
How many hours do you sleep in fall?	0.866	
	Kappa coefficient	
Seasonal changes in eating preferences	0.871	

section, that refers to the intensity of the changes, obtained a coefficient of only 0.52. All the items of the remaining sections showed elevated reliability.

In the adolescent scale (SPAQ-CA), the reliability results were clearly lower. In regards to the SSI, the reliability remained with an Internal Coefficient Consistency (ICC) of 0.583, considerably lower than in the adult version. However it was especially poor for three of the items, social activity (0.043), mood state (0.27), and energy level (0.139). Internal consistence (alpha 0.634) was somewhat better.

Faced with the low reliability obtained in the adolescent scale, we proposed one of the first criterion when validating a scale. That is, the scale should be understandable. It can be considered that some of these items were not well understood by the adolescents. Thus, we decided to add brief explanations or examples in brackets for some of the items, especially those that presented lower reliability. To facilitate the task even more, we added a brief reminder of the periods of the year that are included in each season.

After, the modified SPAQ-IF was applied to the third sample of 30 subjects, using the same methodology. With these changes, the test-retest reliability of the SSI improved, going from an ICC value of 0.583 to 0.634. The three items that demonstrated worse reliability in the previous sample also improved noticeably, there being an ICC of 0.595 for social activity, 0.586 for mood state and 0.756 for energy level (table 2). The final versions of the scales are found in figure 1 (SPAQ-adults [SPAQ-Q]) and figure 2 (SPAQ-children-adolescent [SPAQ-CA]).

DISCUSSION

Seasonality is a trait that can condition and modify the affective disorders, in its mildest forms (S-SAD) or the most serious cases (uni- or bipolar SAD). Although it is possible that it is overdimensioned in its prevalence, the SAD continues to be a relevant clinical entity from the

TABLE 2. Reliability (test-retest) and internal consistency SPQA children-adolescent version

SPAQ-CA (Seasonal Pattern Assessment Questionnaire for Children and Adolescents)		
	Kappa coefficient	
I have less energy	0.579	
I am more irritable	0.726	
I feel worse	0.644	
	Interclass correlation coefficient	
Sleep length	0.728	*Alpha coefficient* 0.697
Get into trouble	0.614	
Social activity	0.595	
Substance abuse (alcohol, tobacco, drugs)	0.820	
Mood state	0.586	
School performance:		
a) Difficulties	0.646	
b) Grades	0.734	
Weight	0.668	
Irritability	0.505	
Energy level	0.756	
Appetite	0.832	
Sum Seasonality	0.634	
	Kappa coefficient	
The seasonal changes are a problem	0.678	
Degree of involvement	0.743	

The objetive of these questions is to assess how your moods and behaviors change over time. Please fill in the pertinent circles ●. It is of interest that **you** answer what you experience, not what **others** have observed.

1. In the following questions, fill in the circles in the months that are pertinent. It can be a single month ●, a sequence of months ●●●, or any other grouping.

In what period of the year do you…

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
A Feel best	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	
B Tend to gain weight	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	
C Socialize most	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	
D Sleep least	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	No particular
E Eat most	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	month
F Lose most weight	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	O	stands out
G Socialize least	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	
H Feel worst	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	
I Eat least	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	
J Sleep most	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	

2. To what degree do the following aspects change with the seasons of the year? (indicate one circle for each question)

	No change	*Slight change*	*Moderate change*	*Marked change*	*Extremely marked change*
A Sleep length	❍	❍	❍	❍	❍
B Social activity	❍	❍	❍	❍	❍
C Mood (feeling of well being)	❍	❍	❍	❍	❍
D Weight	❍	❍	❍	❍	❍
E Appetite	❍	❍	❍	❍	❍
F Energy level	❍	❍	❍	❍	❍

3. If you experience changes with the seasons, do you feel they are a problem? ❍ No ❍ Yes

	Mild	*Moderate*	*Important*	*Severe*	*Serious*
If answer is yes, it is a problem that is	❍	❍	❍	❍	❍

4. How much does your weight fluctuate during the year?
   - ❍ 0-1 kg
   - ❍ 1.5-2 kg
   - ❍ 2.5-3 kg
   - ❍ 3.5-4 kg
   - ❍ 4.5-5 kg
   - ❍ More than 5 kg

5. Approximately how many hours do you sleep each day during each season

	Hours slept per day																		More than 18 h
❍ Winter (21 Dec-20 Mar)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	❍
❍ Spring (21 Mar-20 Jun)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	❍
❍ Summer (21 Jun-20 Sept)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	❍
❍ Fall (21 Sept-20 Dic)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	❍

6. Do you notice a change in food preferences with change of season?

❍ No
❍ Yes

Please specify: _____

Figure 1. *Seasonal Pattern Assessment Questionnaire*, SPAQ.

1. Please, circle the × for the months in whish the following occur:

	Jan	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*All the months the same*
I have less energy (less strength, drive, etc.)	×	×	×	×	×	×	×	×	×	×	×	×	×
I am more irritable (tendendy to, «explode, get angry, fight, etc.)	×	×	×	×	×	×	×	×	×	×	×	×	×
I feel worse	×	×	×	×	×	×	×	×	×	×	×	×	×

Winter: Dec 21-Mar 20
Spring: Mar 21-June 20
Summer: June 21-Sept 20
Fall: Sept 21-Dec 20

2. You notice that some of these things change with the seasons of the year (circle the ×)

	No (0)	*A little (1)*	*Marked (2)*	*A lot (3)*	*Much (4)*
Hours of sleep	×	×	×	×	×
Getting into trouble	×	×	×	×	×
Social activity (speak, go out, call, relate, etc.)	×	×	×	×	×
Substance abuse (alcohol, tobacco, drugs)	×	×	×	×	×
Mood state (feel happy/sad, optimistic/pessimistic, etc.)	×	×	×	×	×
School performance					
a) Difficulties	×	×	×	×	×
b) Grades	×	×	×	×	×
Weight	×	×	×	×	×
Irritability (tendency to «explode,» to get angry, etc.)	×	×	×	×	×
Energy level (sensation of strength/tiredness or drive/weakness)	×	×	×	×	×
Appetite (desire to eat, hunger)	×	×	×	×	×

3. If you notice changes, do they seem to become a problem for you?

Yes: _____ No: _____

If the answer is affirmative, mark the degree of the problem (circle an option with a circle):

Mild A lot Marked Very marked

Figure 2. SPAQ-CA *(Seasonal Pattern Assessment Questionnaire-Children-Adolescents).*

epidemiological point of view. Furthermore, it is not only limited to extreme latitudes but also has real presence in our environment. At present, there are no validated instruments in the Spanish language that make it possible to advance in depth and study of seasonality, specifically, and of its influence on affective disorders (including the SAD). That is where we began this validation process, choosing the scale that was best known and used in this field, the SPAQ of Rosenthal.

The main methodological limitations of the study arise from the sample selection. On the one hand, their size is modest. On the other, selection biases may have occurred as the adult sample was not selected on the basis of randomization of the general population, but rather from persons who work in a same center, although with very varied qualifications and responsibilities. Another limitation occurs with the adolescent samples: all of them are students, and in the case of the first stage of the study, their common characteristic of practicing a competitive sport could mean an additional selection bias. On the other hand, the exclusion of persons who were undergoing psychiatric treatment, although necessary to eliminate another type of confounding factors, prevents us from knowing the influence that seasonality has on persons already diagnosed of some psychiatric disorder. A much larger sample size is required to overcome this obstacle.

In addition, the results obtained in this study are sufficiently satisfactory in the adult version to consider

that we have an instrument translated to Spanish that has acceptable reliability and consistency to measure seasonality. The changes performed in the scale aimed at adolescents and children, that basically consist in explanations to make the items more understandable, noticeably improve the reliability and internal consistence of the instrument, thus obtaining a version that improves the original one. Validation of this instrument opens doors to the study of seasonality variable in our geographic context, which can be considered an advance in the knowledge and understanding of the etiopathogeny, physiopathology, and treatment of affective disorders. When all is said and done, seasonality is, in essence, a dimension that varies on the basis of geography and that affects multiple dimensions of our biology.

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