

# Revista de Psiquiatría y Salud Mental

www.elsevier.es/saludmental



## ORIGINAL ARTICLE

# Impact of the Spanish Consensus on Physical Health of Patients with Schizophrenia

Jerónimo Saiz-Ruiz<sup>a,\*</sup>, M. Dolores Saiz-González<sup>b</sup>, Analucía A. Alegría<sup>a,c</sup>,  
Esperanza Mena<sup>d</sup>, Julia Luque<sup>e</sup>, Julio Bobes<sup>f</sup>

<sup>a</sup>Instituto Ramón y Cajal de Investigación Sanitaria, IRYCIS, Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM), Hospital Universitario Ramón y Cajal, Departamento de Psiquiatría, Universidad de Alcalá, Madrid, Spain

<sup>b</sup>Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM), Hospital Universitario Clínico San Carlos, Departamento de Psiquiatría, Universidad Complutense, Madrid, Spain

<sup>c</sup>New York State Psychiatric Institute, New York, USA

<sup>d</sup>Otsuka Pharmaceutical, S.A., Barcelona, Spain

<sup>e</sup>Bristol Myers Squibb, Departamento Médico, Madrid, Spain

<sup>f</sup>Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM), Departamento de Psiquiatría, Universidad de Oviedo, Oviedo, Asturias, Spain

Received July 14, 2010; accepted November 3, 2010

## KEYWORDS

Schizophrenia;  
Physical health;  
Consensus

## Abstract

**Introduction:** This study evaluates the physical health of patients with schizophrenia and analyzes the change in the percentage of patients with evaluations in the known diabetes and cardiovascular risk predictors before and 6 months after the dissemination of the "Consensus on Physical Health in Schizophrenia Patients".

**Material and methods:** This is an epidemiological non-interventional and transversal study, in which 229 psychiatrists evaluated 1,193 clinical records of patients with a diagnose of schizophrenia according to ICD-10, attended in the psychiatry consultations planned in January and September of 2007. Study results were analyzed using descriptive statistics.

**Results:** 1,193 evaluable patients were included, with a mean age of  $39.7 \pm 11.6$  years, diagnosed of schizophrenia  $15.0 \pm 10.3$  years ago, and a 65.90% were men. The presence of concomitant diseases was 39.98%, being hypercholesterolemia (46.33%), hypertriglyceridaemia (33.54%) and arterial hypertension (26.00%) the most frequent. After the dissemination of the Consensus, the percentage of patients who had all the physical measurements taken increased by 13.75%. Forty eight per cent of the psychiatrists were considered as being aware of the Consensus. The percentage of measurements taken was higher within the psychiatrists who were aware of the Consensus (17.32%) than within those who were not aware of it (10.33%).

\*Corresponding author.

E-mail: jsaiz.hrc@salud.madrid.org (J. Saiz-Ruiz).

**PALABRAS CLAVE**

Esquizofrenia;  
Salud física;  
Consenso

**Conclusions:** The results of this study show an increase of the physical health control from patients with schizophrenia after the dissemination of the Consensus, which should improve an integral approach of these patients to ensure a similar life expectancy, quality of life and function to the general population.

© 2010 SEP and SEPB. Published by Elsevier España, S.L. All rights reserved.

## Impacto del Consenso Español sobre la Salud Física del Paciente con Esquizofrenia

### Resumen

**Introducción:** Este estudio evalúa la salud física de los pacientes con esquizofrenia y analiza el cambio en el porcentaje de pacientes con evaluaciones en los conocidos predictores de diabetes y riesgo cardiovascular antes y 6 meses después de la difusión del «Consenso Español sobre la Salud Física del Paciente con Esquizofrenia».

**Material y métodos:** Se trata de un estudio epidemiológico de corte transversal no intervencionista, en que 229 psiquiatras evaluaron 1.193 historias clínicas de pacientes diagnosticados de esquizofrenia según CIE-10, atendidos en las consultas de psiquiatría programadas primero en enero y posteriormente en septiembre de 2007. Los resultados del estudio se analizaron mediante estadística descriptiva.

**Resultados:** Se incluyeron 1.193 pacientes evaluables, con una edad media de  $39,7 \pm 11,6$  años, diagnosticados de esquizofrenia desde hacía  $15,0 \pm 10,3$  años, y un 65,90% eran hombres. La presencia de enfermedades concomitantes fue del 39,98%, siendo hipercolesterolemia (46,33%), hipertrigliceridemia (33,54%) e hipertensión arterial (26,00%) las más frecuentes. Tras la difusión del Consenso, aumentó en un 13,75% el porcentaje de pacientes a los que se realizaron todas las mediciones de salud física. El 48,5% de los psiquiatras se consideraron conocedores del Consenso. El porcentaje de evaluaciones realizadas fue superior entre los psiquiatras conocedores del Consenso (17,32%) que entre aquellos que no lo conocían (10,33%).

**Conclusiones:** Los resultados de este estudio muestran un aumento del control de la salud física de los pacientes con esquizofrenia tras la difusión del Consenso, que mejoraría el abordaje integral de estos pacientes para garantizar una esperanza de vida, calidad de vida y funcionamiento similares a los de la población general.

© 2010 SEP y SEPB. Publicado por Elsevier España, S.L. Todos los derechos reservados.

## Introduction

Schizophrenia is a chronic mental disease with a prevalence of 0.4-0.6%,<sup>1,2</sup> with little variation between countries.<sup>3</sup> Symptoms signalling the onset of this condition are usually first seen in young adults: between 20-28 years of age in men and 26-32 years of age in women.<sup>4</sup> According to the World Health Organization, 24 to 25 million people worldwide suffer from schizophrenia.<sup>5</sup> Schizophrenia is associated with high rates of morbidity and an increase in mortality, and a mean life expectancy which is 10 to 12 years below than that of the general population.<sup>6</sup> Patients with schizophrenia suffer frequent physical health problems, these contribute to a high mortality rate and a decrease in quality of life.<sup>7</sup> Some of the causes of this increase in mortality include patients' lifestyle, an increase in suicide rates, the development of premature cardiovascular diseases and a high prevalence of metabolic syndrome (MS) and alterations of sugar and lipid metabolism.<sup>8-10</sup>

Given the size of the problem and the lack of a coherent approach to promote physical health in patients with schizophrenia in Spain, it was considered necessary to form medical consensus groups representing different

medical specialties to draw up guidelines indicating how to supervise the health status and improve life expectancy in these patients. A systematic review of the literature has shown that the increase in mortality in patients with schizophrenia is associated with respiratory disease, cardiovascular diseases and cancer.<sup>10-12</sup> In 2007, the Spanish Associations of Psychiatry and Biological Psychiatry drafted the Spanish Consensus on Physical Health of Patients with Schizophrenia,<sup>12</sup> that summarizes the results of a consensus document on the assessment of physical health of schizophrenic patients throughout their lives, and the recommendations for diagnostic procedures and clinical interventions to control modifiable risk factors that affect quality of life, social interaction and life expectancy in patients with schizophrenia in Spain.

It was considered that the widespread use of the Consensus on Physical Health in Schizophrenics would be effective and that it would increase the percentage of patients that underwent physical health assessments. Therefore, assessment of current knowledge and attitudes with reference to the diagnosis and treatment of patients with schizophrenia before and after publication and widespread knowledge of the Consensus was considered

essential to assess the repercussion of said Consensus on the treatment of these patients.

This study examines the physical health of patients with schizophrenia and analyses the impact of the spread of the "Consensus on Physical Health of Patients with Schizophrenia" on psychiatric assessment of the physical health of patients with schizophrenia.

## Material and method

### Study design and population

Epidemiological, non-interventionist, national, multicentre study that includes two cross-sectional data collection phases, one in January 2007 and another in September 2007 (before and after the dissemination of the Spanish Consensus on Physical Health of Patients with Schizophrenia). This study was based on data collection from clinical histories and retrospective data collection during both phases. In both phases eligibility criteria and the availability of clinical parameters related to patients' physical health were determined, demographic data, personal and family histories were collected. In the second phase investigator profile and knowledge of the Spanish Consensus were also analysed. The participants were 200 psychiatrists throughout Spain, selected based on pre-established numbers per geographic region of Spain and the type of health centre they worked in (public, private). Participating psychiatrists had to collect the data of the first six patients who came in for consultation that complied with inclusion and exclusion criteria. Data was included from out-patients of both sexes of an age of or older than 18 years, with a primary diagnosis of schizophrenia according to ICD-10, who attended a programmed consultation visit with a psychiatrist, that had no psychotic symptoms, that were not participating in any other clinical study and that were not attended in the Emergency Service.

This study was assessed by the Clinical Research Ethics Committee of Ramón y Cajal University Hospital (Madrid) and was made in compliance with applicable legal and ethical requirements and international guidelines for epidemiological studies and Good Clinical Practice, according to Law 15/1999 for the Protection of Personal Data in relation to patient data confidentiality. All patients signed a form authorizing data collection.

### Study variables

The main objective of the study was to analyse the changes in the percentage of patients assessed with reference to known predictors of diabetes and cardiovascular risk before and six months after the dissemination of the "Spanish Consensus on Physical Health of Patients with Schizophrenia". This was assessed based on the performance (yes/ no) of each of the following assessments: BMI, weight, abdominal circumference, lipid and glucose profile.

The secondary aim of the study was to assess the change in the percentage of patients that underwent the following assessments: ECG; blood pressure and heart rate; blood count; biochemical analysis (liver function, HIV,

syphilis); prolactin: clinical assessment of galactorrhea; urine analysis and basal creatinine; human papillomavirus (in women); clinical assessment of respiratory condition, visual alterations and dental status; review of antipsychotic medication.

Another secondary objective was the comparison of the impact of the dissemination of the Consensus on physical health assessment in patients with schizophrenia according to geographic region, clinical environment and professional profile of the psychiatrist.

Every participating investigator had to complete a questionnaire related to their professional work and knowledge of the Consensus. Knowledge of the Consensus was defined as having participated in some Consensus related activity or possessing previous knowledge of a Consensus Guide on the physical health of patients with schizophrenia.

### Statistical analysis

Study variables were analysed using descriptive statistics. Quantitative variables were described using mean, standard deviation, range and minimum and maximum values. The median and the interquartile range were used to describe those variables with a normal distribution pattern (Shapiro-Wilks test). Qualitative variables were described using the mean value of relative and absolute frequencies.

A primary analysis was performed estimating the confidence interval for the difference on the percentage of patients that underwent physical health determinations during the cross-sectional assessment in phase 1 and phase 2. To determine change the McNemar test (paired analysis) was used. A unilateral statistical significance value of  $P < .05$  was used. Statistical analysis was carried out with a SPSS 8.0 for Windows statistical program. (SAS Institute Inc., Cary, NC, USA).

## Results

### Patients' sociodemographic and clinical data

Of the 1,418 patients initially included in the two cross-sectional assessments, a total of 1,193 patients were considered valid for analysis, and were seen during both study phases. Geographic distribution of the patients was similar: 22.05% (n=263) in the Northwest region, 23.47% (n=280) in the Central region, 24.81% (n=296) in the Northeast region and 29.67% (n=354) in the Southern region.

Of the 1,193 patients that participated in the study, 65.90% (n=777) of the patients assessed were men, with a mean age of  $39.7 \pm 11.6$  years. The average time of schizophrenia diagnosis was  $15.0 \pm 10.3$  years, and 72.09% (n=860) of the patients suffered from paranoid schizophrenia. And 27.24% (n=325) of patients had a direct family history of schizophrenia: siblings (38.15%), father (16.6%) and mother (16.3%).

With reference to lifestyle (Fig. 1), 30.77% (n=367) of patients said they consumed alcohol and 54.23% (n=647) were regular smokers. A further 16.43% (n=196) admitted consuming illegal drugs, mostly cannabis (86.7%) and

cocaine (35.7%). No significant differences as to lifestyle were seen in different geographical areas.

With reference to concomitant physical disease, 39.98% (n=477) of patients had some concomitant physical disease, with an average of  $2.3 \pm 1.5$  diseases per patient. In Figure 2 it is possible to see the prevalence of concomitant disease, with hypercholesterolemia (46.33%), hypertriglyceridaemia (33.54%) and hypertension (26.00%) being those of greatest prevalence. It is important to note the high percentage of patients - between 21.17% and 38.36% - with no available information on the diseases included in the questionnaire.

### Investigators' demographic data

A total of 229 investigators participated who recruited 1,193 assessable patients. Complete data were obtained

Alcohol	
Tobacco	
Illegal substances	

No Yes Not available  
**Figure 1** Lifestyle.

Other
Respiratory disease
Liver function alteration
Metabolic syndrome
HBV/HCV infection
Syphilis
HIV infection
Morbid obesity
Thyroid dysfunction
Diabetes mellitus
Hypertriglyceridaemia
Hypercholesterolemia
Arterial hypertension

on 167 investigators; of these 94.2% were from the Central region, 74.5% from the Northwest region, 58.9% from the Northeast region and 66.7% from the Southern region. Of these 82.93% investigators worked in a public health centre and 96.39% worked in an urban area. 65.66% (n=109) of the investigators were men, with an average age of  $44.8 \pm 8.3$  years.

48.50% (n=81) of the investigators were considered to have knowledge of the Consensus, and 88.89% (n=72) of these psychiatrists said the Consensus had influenced them to some degree.

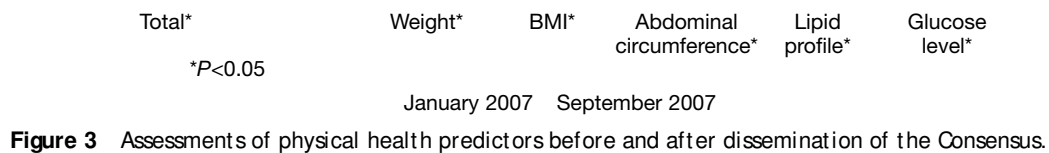
### Impact of the Consensus

The percentage of patients with assessments of all physical health predictors before the dissemination of the Consensus was 15.5%, and after the dissemination of the Consensus 29.3%. Therefore, after the dissemination of the Consensus there was a significant increase - 13.75% - ( $P < .05$ ) of data collection on physical health predictors. Specifically, there was a significant increase ( $P < .05$ ) in the percentage of patients with assessment of the following parameters: weight: 13.66%, BMI: 13.58%, abdominal circumference: 14.00%, lipid profile: 2.93% and glucose level: 2.60% (Fig. 3).

An analysis of the current change in percentages, i.e. the patients in whom parameters were assessed after the dissemination of the Consensus but not previously, showed a significant increase ( $P < .0001$ ) of 16.60% for all parameters, 19.45% for weight, 18.19% for BMI and 17.44% for abdominal circumference. Increases were also seen in lipid profile (14.92%) and glucose level (14.42%), although these were not significant (Table 1).

No Yes Not available

**Figure 2** Concomitant diseases.

**Table 1** Assessments of physical health predictors before and after dissemination of the Consensus

Parameters	January 2007 (%)	September 2007 (%)	Actual change* (%)	P-value
Measurements of all parameters	15.5	29.3	16.60	<0.0001 (M)*
Weight	58.93	72.59	19.45	<0.0001 (M)*
BMI	32.77	46.35	18.19	<0.0001 (M)*
Abdominal circumference	19.20	33.19	17.44	0.0576 (M)
Lipid profile	69.57	72.51	14.92	0.0898 (M)
Glucose level	70.58	73.18	14.42	<0.0001 (M)*

M: McNemar.  
 \*Percentage of patients whose parameters were assessed after the Consensus who had not been assessed previously.

**Figure 4** Changes in the assessment of diagnostic parameters after dissemination of the Consensus, \*  $P < 0.05$ .

In Figure 4 it is possible to see the increase in the percentage of assessment of diagnostic parameters such as ECGs, blood pressure, heart rate, blood count, liver function and syphilis among others, after the dissemination of the Consensus when no previous assessments had been made.

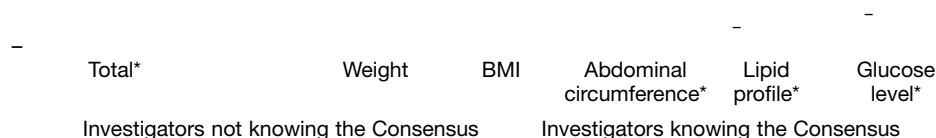
#### Impact of the Consensus according to the investigator's knowledge of the Consensus

Table 2 and Figure 5 show the percentage of assessment of physical health predictors before and the increase after dissemination of the Consensus independent of whether the

**Table 2** Assessment of physical health predictors before and after dissemination of the Consensus according to investigator knowledge of said Consensus

Parameter	Knowledge of the Consensus	January 2007	September 2007	CI-difference
All	No	13.63%	23.96%	10.33%-CI (8.6%, 12.06%)
	Yes	15.85%	33.17%	17.32%-CI (15.17%, 19.46%)
<b>P-value</b>		<b>0.3554 (C)</b>	<b>0.0027 (C)*</b>	<b>P&lt;.05 (M)</b>
Weight	No	53.63%	67.25%	13.63%-CI (11.68%, 15.57%)
	Yes	60.98%	77.07%	16.1%-CI (14.01%, 18.18%)
<b>P-value</b>		<b>0.0329 (C)</b>	<b>0.0015 (C)</b>	<b>ns (M)</b>
BMI	No	29.01%	43.52%	14.51%-CI (12.51%, 16.5%)
	Yes	33.17%	48.05%	14.88%-CI (12.86%, 16.9%).
<b>P-value</b>		<b>0.2107 (C)</b>	<b>0.1942 (C)</b>	<b>ns (M)</b>
Abdominal circumference	No	17.14%	28.79%	11.65%-CI (9.83%, 13.47%)
	Yes	19.51%	37.07%	17.56%-CI (15.4%, 19.72%)
<b>P-value</b>		<b>0.3793 (C)</b>	<b>0.0110 (C)</b>	<b>p&lt;0.05 (M)</b>
Lipid profile	No	72.09%	70.33%	-1.76%-CI (-2.5%, -1.01%)
	Yes	69.51%	76.34%	6.83%-CI (5.4%, 8.26%)
<b>P-value</b>		<b>0.4108 (C)</b>	<b>0.0546 (C)</b>	<b>P&lt;.05 (M)</b>
Glucose level	No	71.43%	70.77%	-0.66%-CI (-1.12%, -0.2%)
	Yes	71.95%	77.32%	5.37%-CI (4.09%, 6.64%)
<b>P-value</b>		<b>0.8801 (C)</b>	<b>0.0302 (C)</b>	<b>P&lt;.05 (M)</b>

Statistical test: (C) Chi-square test/ (McNemar). \*  $P<.05$ .

**Figure 5** Assessment of physical health predictors before and after dissemination of the Consensus according to investigator knowledge of said Consensus, \*  $P<.05$ .

investigator had knowledge or not of the Consensus. These were significant for all parameters with the exception of lipid profile and glucose level.

An analysis of the current change in percentages, i.e. the patients in whom parameters were assessed after the dissemination of the Consensus but not previously, it was possible to see a greater increase among investigators who had knowledge of the Consensus. 20.49 vs 13.19% for all parameters, 21.95 vs 17.14% for weight, 20.49 vs 17.14% for BMI, 21.46 vs 14.51% for abdominal circumference, 16.83 vs 10.99% for lipid profile and 15.61 vs 10.99% for glucose

level, although these changes were not significant for any parameter.

## Discussion

This is the first epidemiological study carried out in Spain that describes the physical health of patients with schizophrenia and analyses the impact of the dissemination of the Spanish Consensus on Physical Health of Patients with Schizophrenia.

In relation to lifestyle, it is known that comorbid substance abuse will affect the course of schizophrenia, indeed, around 50% of schizophrenics develop alterations due to alcohol or illegal substances abuse at some point during their lives.<sup>13</sup> From the results of this study, it was seen that 31% of participating patients consumed alcohol, and 16% consumed illegal drugs, mostly cannabis (87%) and cocaine (36%). Many schizophrenics possibly consume alcohol or illegal drugs to alleviate their symptoms or in an attempt to overcome their fear, sense of isolation and depression.<sup>14</sup> Specifically, the use of cannabis is especially common among younger patients and may trigger a psychotic outbreak.

Furthermore, the results of this study show that 54% of participating schizophrenics were regular smokers. It is known that smoking is related to respiratory conditions, and that these are frequently seen in patients with schizophrenia. Indeed, schizophrenics have a higher rate of respiratory symptoms and poor lung function than the general population.<sup>15</sup> In this study, the percentage of patients suffering from respiratory conditions was not very high (15%), maybe due to the relatively low average patient age. We assume that, unless action is taken to decrease/suppress smoking in these patients, the percentage of patients with respiratory conditions will increase over the next few years in the population studied. Therefore, some kind of intervention to help these patients give up smoking could be appropriate and have good results.<sup>16</sup>

Schizophrenia has been associated with higher physical comorbidity rates and higher mortality rates. It has been shown that 50% of patients suffering from schizophrenia have at least one physical or psychiatric comorbid condition.<sup>12</sup> The most frequent physical conditions are cardiovascular, metabolic, endocrine, and neurological diseases, infections and disorders due to substance abuse. This has been confirmed among the schizophrenics participating in this study, in which it was seen that 40% had some concomitant physical disease, with an average of 2 diseases per patient. It must be noted that the most prevalent concomitant diseases were hypercholesterolemia (46%), hypertriglyceridaemia (33%) and hypertension (26%). The alterations seen contributed markedly to the development of cardiovascular disease and metabolic alterations.<sup>17-20</sup>

Schizophrenics have less access to health care, consume less health care services and are less compliant with treatment than the general population.<sup>12,18</sup> Indeed, in spite of the high rates of physical disease in schizophrenics, they have less access to health care and therefore less opportunity for the detection and prevention of cardiovascular risk factors.<sup>21,22</sup> Physical comorbidity in schizophrenics are frequently undetected and therefore under-treated. In general, these patients are at high risk of not receiving appropriate health care.<sup>23</sup> In our study, it was seen that the range of non-available information on concomitant diseases was from 21% to 38%, which confirms that there is a high percentage of schizophrenics that are under-diagnosed and insufficiently supervised. Nevertheless, health interventions related to physical health education cause a beneficial change in lifestyle in patients with schizophrenia.<sup>24</sup>

Considering the main objective of this study, analysing the change on the percentage of patients with diabetes

and cardiovascular risk assessments before and after the dissemination of the Consensus, an increase of 14% was seen in the collection of information on physical health predictors. The increase seen in the number of patients that underwent physical health assessments confirms the efficacy of the dissemination of the Consensus. The increase (17%) seen when analysing the current change in percentages of assessments, i.e. the patients in whom parameters were assessed after the dissemination of the Consensus but not previously, is noteworthy, and indicates a greater tendency to collect data and register physical health parameters in patients with schizophrenia. It is evident that the more patients with schizophrenia undergo physical health assessments, more will benefit from an integral approach and control of physical health conditions.<sup>12</sup>

The efficacy of the dissemination of the Consensus is also obvious based on the increase on the percentage of assessments of physical health parameters after Consensus dissemination when most of these were not previously assessed, as there is an important increase on these assessments for most of the analysed parameters (75%).

Furthermore, when comparing the impact of dissemination of the Consensus on the physical health assessment of schizophrenics according to the professional profile of the psychiatrist, an increase in the percentage of assessments was seen in both groups of psychiatrists (17% among those who had knowledge of the Consensus and 10% among those that did not), with a greater difference seen in data collection in the group of psychiatrists who had knowledge of the Consensus.

The importance of assessing these parameters has been widely demonstrated. Consequently, it has been seen that among schizophrenics there is a greater prevalence of HCV carriers, and of HIV infection than in the general population.<sup>25-27</sup> Furthermore, patients with schizophrenia have a greater incidence and prevalence of diabetes<sup>27-30</sup> and metabolic syndrome<sup>11,31,32</sup> which is at least double that of the general population. Schizophrenics also suffer a greater rate of heart failure, arrhythmias and stroke<sup>20</sup> and a higher rate of respiratory symptoms and poor lung function.<sup>15</sup> Finally, with reference to global mortality, schizophrenics are at a greater risk of death than the general population.<sup>17,33,34</sup> Their higher rate of cardiovascular mortality is attributable, in part, to an increase in modifiable risk factors for coronary disease: obesity, smoking, diabetes, hypertension and dyslipidaemia.<sup>22</sup>

The results of this study support that fact that psychiatrists must be capable of detecting and reducing risk factors associated with cardiovascular disease, such as obesity, hyperlipidaemia, diabetes and hypertension; and diseases related to patient behaviour, such as HIV infection, hepatitis B and C, and respiratory conditions, closely related to smoking, which is common in schizophrenics.

This study has a possible limitation, and that is that although the 229 psychiatrists who participated in the study were an ample and heterogeneous sample from all regions in Spain, and they worked in different environments (public, private), it cannot be ruled out that this may not have been a representative sample of the psychiatrists currently working in Spain. Nevertheless, this possible

limitation does not affect the evaluation of the study objectives.

In conclusion, the results obtained in this study support the fact that, although other factors may have had some influence, the dissemination of the "Consensus on Physical Health in Patients with Schizophrenia", has made psychiatrists aware of the need for an integral approach when dealing with patients with schizophrenia, stimulating physical health controls in these patients, which undoubtedly contributes to their greater life expectancy, improved quality of life and similar health care to that of the general population.

## Funding

This study was sponsored by Bristol Myers Squibb and Otsuka Pharmaceutical.

## Conflict of interest

The authors declare they have no conflict of interest related to this article.

## References

- Bhugra D. The global prevalence of schizophrenia. *PLoS Med*. 2006;2:372-3.
- Goldner EM, Hsu L, Waraich P, Somers JM. Prevalence and incidence studies of schizophrenic disorders: a systematic review of the literature. *Can J Psychiatry*. 2002;47:833-43.
- Jablensky A, Sartorius N, Ernberg G, Anker M, Korten A, Cooper JE, et al. Schizophrenia: manifestations, incidence and course in different cultures. A World Health Organization ten-country study. *Psychol Med Monogr Suppl*. 1992;30:1-97.
- Castle D, Wesseley S, Der G, Murray RM. The incidence of operationally defined schizophrenia in Camberwell 1965-84. *Br J Psychiatry*. 1991;159:790-4.
- Valencia CM. Trastornos mentales y problemas de salud mental: Día mundial de la salud mental 2007. *Salud Ment*. 2007;30:75-80.
- Goff DC, Cather C, Evins AE, Henderson DC, Freudenreich O, Copeland PM, et al. Medical morbidity and mortality in schizophrenia: guidelines for psychiatrists. *J Clin Psychiatry*. 2005;66:183-94.
- Von Hausswolff-Juhlin Y, Bjartveit M, Lindström E, Jones P. Schizophrenia and physical health problems. *Acta Psychiatr Scand Suppl*. 2009;438:15-21.
- Brown S, Inskip H, Barraclough B. Causes of the excess mortality of schizophrenia. *Br J Psychiatry*. 2000;177:212-7.
- Bobes J, Arango C, Aranda P, Carmena R, García-García M, Peñas J. Cardiovascular and metabolic risk in outpatients with schizophrenia treated with antipsychotics: Results of the CLAMORS study. *Schizophr Res*. 2007;90:162-73. Epub 2006 Nov 21.
- Arango C, Bobes J, Aranda P, Carmena R, García-García M, Peñas J, et al. A comparison of schizophrenia outpatients treated with antipsychotics with and without metabolic syndrome: Findings from the CLAMORS study. *Schizophr Res*. 2008;104:1-12.
- Cohn T, Prud'homme D, Streiner D, Kameh H, Remington G. Characterizing coronary heart disease risk in chronic schizophrenia: high prevalence of the metabolic syndrome. *Can J Psychiatry*. 2004;49:753-60.
- Saiz Ruiz J, Bobes García J, Vallejo Ruiloba J, Giner Ubago J, García-Portilla González MP. Grupo de Trabajo sobre la Salud Física del Paciente con Esquizofrenia. Consenso sobre la salud física del paciente con esquizofrenia de las Sociedades Españolas de Psiquiatría y de Psiquiatría Biológica. *Actas Esp Psiquiatr*. 2008;36:251-64.
- Lybrand J, Caroff S. Management of schizophrenia with substance use disorders. *Psychiatr Clin North Am*. 2009;32:821-33.
- Häfner H. Psychosis and Cannabis. *Rev Psiquiatr Clin*. 2005;32:53-67.
- Filik R, Spos A, Kehoe PG, Burns T, Cooper SJ, Stevens H, et al. The cardiovascular and respiratory health of people with schizophrenia. *Acta Psychiatr Scand*. 2006;113:298-305.
- George TP, Vessicchio JC, Termine A, Bregartner TA, Feingold A, Rounsaville BJ, et al. A placebo controlled trial of bupropion for smoking cessation in schizophrenia. *Biol Psychiatry*. 2002;52:53-61.
- Harris EC, Barraclough B. Excess mortality of mental disorders. *Br J Psychiatry*. 1998;173:11-53.
- Hennekens CH, Hennekens AR, Hollar D, Casey DE. Schizophrenia and increased risks of cardiovascular disease. *Am Heart J*. 2005;150:1115-21.
- Enger C, Weatherby L, Reynolds RF, Glasser DB, Walker AM. Serious cardiovascular events and mortality among patients with schizophrenia. *J Nerv Ment Dis*. 2004;192:19-27.
- Curkendall SM, Mo J, Glasser DB, Rose Stang M, Jones JK. Cardiovascular disease in patients with schizophrenia in Saskatchewan, Canada. *J Clin Psychiatry*. 2004;65:715-20.
- Friedli L, Dardis C. Not all in the mind: Mental health service user perspectives on physical health. *J Mental Health Promotion*. 2002;1:36-46.
- De Hert M, Dekker JM, Wood D, Kahl KG, Holt RI, Möller HJ. Cardiovascular disease and diabetes in people with severe mental illness: position statement from the European Psychiatric Association (EPA), supported by the European Association for the Study of Diabetes (EASD) and the European Society of Cardiology (ESC). *Eur Psychiatry*. 2009;24:412-24. Epub 2009 Aug 13.
- Nasrallah HA. An overview of common medical comorbidities in patients with schizophrenia. *J Clin Psychiatry*. 2005;66(Suppl. 6):3-4.
- Bushe C, Haddad P, Peveler R, Pendlebury J. The role of lifestyle interventions and weight management in schizophrenia. *J Psychopharmacol*. 2005;19(6 Suppl):28-35.
- Nakamura Y, Koh M, Miyoshi E, Ida O, Morikawa M, Tokuyama A, et al. High prevalence of the hepatitis C virus infection among the inpatients of schizophrenia and psychoactive substance abuse in Japan. *Prog Neuropsychopharmacol Biol Psychiatry*. 2004;28:591-7.
- Grassi L, Pavanati M, Cardelli R, Ferri S, Peron L. HIV-risk behaviour and knowledge about HIV/ AIDS among patients with schizophrenia. *Psychol Med*. 1999;29:171-9.
- Blank MB, Mandell DS, Aiken L, Hadley TR. Co-occurrence of HIV and serious mental illness among medicaid recipients. *Psychiatr Serv*. 2002;53:868-73.
- Subramaniam M, Chong SA, Pek E. Diabetes mellitus and impaired glucose tolerance in patients with schizophrenia. *Can J Psychiatry*. 2003;48:345-7.
- Carlson C, Hornbuckle K, DeLisle F, Kryzhanovskaya L, Breier A, Cavazzoni P. Diabetes mellitus and antipsychotic treatment in the United Kingdom. *Eur Neuropsychopharmacol*. 2006;16:366-75.
- Buse JB, Cavazzoni P, Hornbuckle K, Hutchins D, Breier A, Jovanovic L. A retrospective cohort study of diabetes mellitus



- and antipsychotic treatment in the United States. *J Clin Epidemiol.* 2003;56:164-70.
31. Heiskanen T, Niskanen L, Lyytikäinen R, Saarinen PI, Hintikka J. Metabolic syndrome in patients with schizophrenia. *J Clin Psychiatry.* 2003;64:575-9.
32. De Hert MA, Van Winkel R, Van Eyck D, Hanssens L, Wampers M, Scheen A, et al. Prevalence of the metabolic syndrome in patients with schizophrenia treated with antipsychotic medication. *Schizophr Res.* 2006;83:87-93.
33. Brown S. Excess mortality of schizophrenia. A meta-analysis. *Br J Psychiatry.* 1997;171:502-8.
34. Osby U, Correia N, Brandt L, Ekblom A, Sparén P. Mortality and causes of death in schizophrenia in Stockholm County, Sweden. *Schizophrenia Res.* 2000;45:21-8.