

## Quality of Life in Hypertensive Patients and Concurrent Validity of Minichal-Brazil

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### Abstract

**Background:** Health-Related Quality of Life Questionnaires (HRQOL) are humanistic outcome measure instruments both in clinical and in pharmaco-economic studies. However, they should have their psychometric parameters evaluated so as to reflect the individual subjective assessment of quality of life.

**Objectives:** To describe the quality of life profile of hypertensive patients and to assess the concurrent validity of the Minichal-Brazil instrument by comparing it to the generic World Health Organization's (WHO) assessment instrument known as WHOQOL-Bref.

**Methods:** A total of 191 adult patients (72.8% females) with hypertension were interviewed. Approximately one third of these patients had their hypertension controlled. The mean HRQOL as measured by the total Minichal score was 69.7 (SD = 19.2; 95%CI from 66.9 to 72.4); the "mental status" domain and "somatic manifestations" domain scores were 69.1 (95%CI from 66.1 to 72.2), and 69.9 (95%CI from 66.5 to 73.2), respectively. The means for the WHOQOL-Bref instrument were: in the "physical" domain = 61.5 (95%CI from 59.0 to 64.1); in the "psychological" domain = 65.7 (95%CI from 63.2 to 68.2); in the "social" domain = 72.3 (95%CI from 70.0 to 74.5); and in the "environment" domain = 59.7 (95%CI from 57.7 to 61.7).

**Results:** Minichal significantly correlated ( $p < 0.001$ ) with WHOQOL-Bref as regards all its domains, except for the "environment" domain, which did not correlate with the "somatic manifestations" domain.

**Conclusion:** Minichal-Brazil proved to be a useful tool in the assessment of HRQOL in hypertensive patients. (Arq Bras Cardiol 2010; 94(3):337-344)

**Key words:** Hypertension; quality of life; evaluation studies; cross-sectional studies; questionnaires.

### Introduction

Systemic hypertension (SH) is the most prevalent cardiovascular disease in Brazil. Between 22.3% and 43.9% of the adult population are estimated to present blood pressure (BP) levels  $\geq 140$  mmHg (systolic) and  $\geq 90$  mmHg (diastolic)<sup>1</sup>. Studies have demonstrated that some of the major factors that impact the quality of life of hypertensive patients are target organ complications and adverse effects of antihypertensive medications<sup>2</sup>.

Quality of life (QoL) represents the sum of subjective sensations related to the state of well-being<sup>3</sup>. Two persons with the same health status may have different perceptions on their quality of life, but this does not allow

extrapolations to be made from one patient to another<sup>4</sup>. Also, interpretations from patients, family and the health team may vary, thus creating assessment disparities, and this reinforces the importance of the patient himself assessing his health condition<sup>4</sup>.

According to the World Health Organization, quality of life is defined as "individuals' perceptions of their position in life in the context of the culture and value system in which they live and in relation to their goals, expectations, standards and concerns"<sup>5</sup>.

Instruments for the measurement of quality of life were created so that health professionals could effectively measure the impact of health interventions on the quality of life and, more specifically, the health-related quality of life. For that purpose, valid measurement questionnaires are required<sup>6</sup>.

In Brazil, there are several studies of cultural adaptation of health-related quality of life instruments. The most widely used generic instrument for the hypertensive population is the Medical Outcomes Study 36-Item Short Form (SF-36)<sup>7,8</sup>. The Spanish Short Form of Quality of Life Questionnaire for Arterial

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Hypertension (Minichal) emerges as the most frequently used specific instrument in SH<sup>7</sup>.

Recently, a study of cultural adaptation and validation of Minichal for Brazilian Portuguese was published. It evaluated criteria of content, construct and internal consistency of the instrument, by comparing results in hypertensive patients and normotensive individuals. Data on concurrent validity comparing Minichal to other QoL measurement instruments were not obtained, thus making further studies necessary<sup>9,10</sup>.

The objective of the present study was to describe the quality of life profile of hypertensive patients and to assess the concurrent validity of the Minichal-Brazil instrument, by comparing its performance to that of the generic QoL assessment instrument known as WHOQOL-Bref.

## Methods

Cross-sectional, non-randomized study conducted in the public health system in Southern Brazil by means of interviews carried out by trained professionals with proper skills for the study. All patients included were diagnosed with SH according to local diagnostic criteria; they attended the primary health care units where the study was conducted, were taking at least one medication to control hypertension, and were 18 years old or older.

By convenience, the sample was composed in an independent manner by all patients who agreed to participate in the research and attended the primary health care unit in the days of the interviews.

Patients with secondary hypertension, pregnant women or individuals with severe acute or chronic mental disorders were excluded. The study period extended from January to October 2007.

Araucária was the town chosen for the study; it belongs in the Metropolitan Region of the city of Curitiba and has a per capita income of 136.45 dollars (242.06 real) as analyzed in 2000, that is, it is a low-income region<sup>11</sup>.

Sociodemographic data (gender, age, years of schooling, marital status and race), clinical data (systolic and diastolic blood pressure, time of diagnosis of SH, body mass index, and antihypertensive treatment) were analyzed, in addition to comorbidities and cardiovascular risk factors such as diabetes, dyslipidemia, depression, obesity, cardiac arrhythmia, heart failure, cigarette smoking, family history of cardiovascular disease, history of stroke, and history of infarction. These data were collected by means of a structured interview and the patients reported their comorbidities. In cases of doubt, data were confirmed in the patients' medical records.

The QoL assessment tools were administered in one single interview for each patient.

This study was approved by the human research ethics committee and is registered in the National Research Ethics Commission (*Comissão Nacional de Ética em Pesquisa - Conep*). All patients received information regarding the objectives of the study and gave their written informed consent.

## Health-related quality of life measurement questionnaires

Minichal was developed in Spain in 2001 and comprises 16 items. Ten items are related to the "mental status" domain and six items to "somatic manifestations". Questions refer to the past seven days. The score scale is a likert-type scale with four possible answers (0=absolutely no; 1=yes, a little; 2=yes, fairly; 3=yes, a lot). The points range from 0 (best health level) to 30 (worst health level) for the "mental status" dimension, and from 0 (best health level) to 18 (worst health level) for the "somatic manifestations" dimension. In this study, the original score of the instrument was converted into a scale from zero to 100, where zero is the worst level and 100 is the best level of health-related quality of life (HRQOL)<sup>12</sup>. This conversion was necessary to permit the comparison of Minichal results to those of WHOQOL-Bref, which originally uses this scale.

In the Minichal Portuguese version, one question was changed from domain after factorial analysis. The "mental status" domain includes questions 1 to 9, and the maximum scoring is 27 points. The "somatic manifestations" domain includes questions 10 to 16, with a maximum scoring of 21 points. The already validated Brazilian version presented a Cronbach's  $\alpha$  of 0.88 for the "mental status" domain and 0.86 for the "somatic manifestations" domain<sup>9</sup>. Both the original in Spanish and the Brazilian version include one last question regarding the general impact of hypertension on the patient's QoL. This instrument was originally developed to be self-administered. In this study, however, because of the low educational level of the patients, the instrument was administered by means of a structured interview.

WHOQOL-Bref is an instrument developed by the World Health Organization's Quality of Life Group and comprises 26 questions; it is an abbreviated version of WHOQOL-100. It comprises two general questions on quality of life and 24 questions that represent each one of the 24 facets of WHOQOL-100. This instrument has four domains: "physical" (seven questions), "psychological" (six questions), "social" (three questions) and "environment" (eight questions). The scale used is a five-point likert-type scale and the score ranges from zero to 100, where zero is the worst level and 100 is the best possible HRQOL<sup>13</sup>.

BP was measured three consecutive times for each patient, with a minimum one-minute interval between measurements. The automatic digital OMRON HEM-722C device was used. This device is validated by protocols of the Association for the Advancement of Medical Instrumentation and by the British Hypertension Society for International Research<sup>14</sup>. The mean BP was obtained considering the last two measurements taken for each patient. Hypertensive patients were deemed controlled if their BP was < 140/90 mmHg, according to Brazilian and international guidelines<sup>15-18</sup>. The patients were also grouped according to the SH stage as defined by the V Brazilian Guidelines of Hypertension<sup>18</sup>, which divide SH in three stages starting from BP  $\geq$  140/90 mmHg. Stage 1 corresponds to systolic blood pressure (SBP) between 140 and 159 mmHg or diastolic blood pressure (DBP)

between 90 and 99 mmHg. Stage 2 corresponds to SBP between 160 and 179 mmHg or DBP between 100 and 109 mmHg. Stage 3 corresponds to SBP  $\geq$ 180 mmHg or DBP  $\geq$ 110 mmHg.

The parameter used to verify overweight or obesity was body mass index (BMI), which was calculated from the weight and height of the patients as measured at the moment of the interview.

Statistical analysis was carried out using the SPSS version 12.0 for Windows software program. For the comparison of means between groups, the Mann-Whitney U test (two groups) or the Kruskal-Wallis test (three groups or more) were used. The Spearman correlation coefficient was calculated for the correlation between variables. P values  $<$  0.05 were considered significant.

## Results

A total of 191 adult patients (72.8% women) diagnosed with hypertension and who used some hypertensive treatment were interviewed. The mean age of the patients was 58.4 years (SD = 11.4, ranging from 29 to 84 years). The mean body mass index (BMI) was 29.06 (SD=6.11, ranging from 18 to 62 kg/m<sup>2</sup>). The patients' mean level of educational attainment was 3.0 years of formal schooling. In the quality of life assessment using WHOQOL-Bref, two patients did not answer all the questions of the questionnaire and were, therefore, excluded from the study in the comparative analyses between the instruments. The detailed profile of the study participants is shown in Table 1.

BP was controlled in approximately one third of the patients (30.4%) (Table 1). The mean SBP was 151.6 mmHg (95%CI 147.9-155.2 mmHg) and the mean DBP was within the limit considered controlled (86.3; 95%CI 84.4-88.2 mmHg) (Table 2).

The most frequently used antihypertensive medications were captopril (63.35%), hydrochlorothiazide (44.50%), and nifedipine (19.37%). Approximately half of the patients (45.5%) were receiving monotherapy. The most frequent combinations were captopril plus hydrochlorothiazide (20.4%), captopril plus nifedipine (4.7%), propranolol plus hydrochlorothiazide (3.7%), hydrochlorothiazide plus nifedipine (3.7%), captopril plus hydrochlorothiazide plus nifedipine (3.7%), and captopril plus furosemide (3.1%).

The mean HRQOL as measured by the total Minichal score in a scale from 0 to 100 was 69.7 (SD=19.2; 95%CI 66.9 – 72.4). The means as per domain were pretty close; in the “mental status” domain the mean was 69.1 (95%CI 66.1 – 72.2), and in the “somatic manifestations” domain it was 69.9 (95%CI 66.5-73.2). In the internal consistency analysis of Minichal, a Cronbach's  $\alpha$  of 0.843 was obtained. The “mental status” domain showed  $\alpha$ =0.798 and the “somatic manifestations” domain,  $\alpha$ =0.749.

The means for the WHOQOL-Bref instrument were analyzed as per domain. In the “physical” domain, a mean of 61.5 (95%CI 59.0 – 64.1) was obtained; in the “psychological” domain, of 65.7 (95%CI 63.2 – 68.2); in the “social” domain, of 72.3 (95%CI 70.0 – 74.5); and in the “environment” domain, of 59.7 (95%CI 57.7 – 61.7).

No differences were found in HRQOL as measured by Minichal and WHOQOL-Bref among controlled and non-controlled hypertensive patients ( $p>$ 0.10). Minichal and WHOQOL-Bref results according to stratification of SH stages are shown in Table 2<sup>18</sup>. No significant differences were found in HRQOL between the patients in the different SH stages for both instruments ( $p>$ 0.10).

Differences in Minichal and WHOQOL-Bref results between patients according to gender and presence/absence of comorbidities and cardiovascular risk factors are shown in Table 3. A significant difference ( $p<$ 0.05) between patients with or without depression was found in all domains of both instruments. The other variables presenting significant difference ( $p<$ 0.05) between the patients were: a) for the total Minichal score and the “mental status” domain: gender and heart failure; b) for the Minichal “somatic manifestations” domain: gender, diabetes, dyslipidemia, heart failure and obesity; c) for WHOQOL-Bref in the “physical” domain: heart failure and obesity; d) in the “psychological” domain: heart failure and

**Table 1 - Characteristics of the study sample (n=191)**

		n (%)
Age	29-54 years	73 (38.2)
	55-64 years	59 (30.9)
	$\geq$ 65 years	59 (30.9)
BMI *	Normal weight	47 (24.7)
	Overweight	74 (38.9)
	Obesity	69 (36.3)
Time of diagnosis <sup>†</sup>	<1 year	3 (1.6)
	1-5 years	78 (41.5)
	6-10 years	47 (25.0)
	>10 years	60 (31.9)
SH	Controlled	58 (30.4)
	Stage-1 hypertension	60 (31.4)
	Stage-2 hypertension	47 (24.6)
	Stage-3 hypertension	26 (13.6)
Marital status	Single	6 (3.1)
	Married	129 (67.5)
	Divorced	19 (9.9)
	Widowed	37 (19.4)
Skin color	Black	20 (10.5)
	Mixed	83 (43.5)
	White	88 (46.1)

\* n=190, body weight value was not obtained for one individual. <sup>†</sup> n=188, patients could not recall the year when they were diagnosed with hypertension

Table 2 – Health-related quality of life according to the stages of SH\*

		Minichal			WHOQOL-Bref			
		Total of the instrument Mean (SD)	Mental status Mean (SD)	Somatic manifestations Mean (SD)	Physical Mean (SD)	Psychological Mean (SD)	Social Mean (SD)	Environment Mean (SD)
Classification of Blood Pressure	BP <140/90 mmHg	70.3 (19.4)	69.2 (21.6)	71.3 (23.7)	61.9 (18.1)	65.7 (16.1)	73.1 (15.8)	59.0 (13.0)
	Stage-1 hypertension	71.1 (17.2)	72.2 (16.8)	68.9 (25.7)	59.9 (17.0)	67.6 (18.0)	72.8 (14.1)	62.3 (15.1)
	Stage-2 hypertension	66.6 (18.9)	65.1 (24.0)	67.3 (20.1)	59.9 (18.5)	61.9 (18.9)	69.2 (17.6)	56.7 (14.2)
	Stage-3 hypertension	70.7 (23.6)	69.1 (25.1)	73.9 (24.0)	67.4 (16.0)	67.9 (15.0)	74.8 (14.9)	60.9 (13.9)
	p**	0.598	0.640	0.397	0.192	0.323	0.525	0.341

Results of MINICHAL and WHOQOL-Bref according to stratification of SH stages, as recommended by the V Brazilian Guidelines of Hypertension. These Guidelines classify SH in three stages when BP is  $\geq 140/90$  mmHg. Stage 1 corresponds to SBP between 140 and 159 mmHg or DBP between 90 and 99 mmHg. Stage 2 corresponds to SBP between 160 and 179 mmHg or DBP between 100 and 109 mmHg, and stage 3 corresponds to SBP  $\geq 180$  mmHg or DBP  $\geq 110$  mmHg. BP=Blood Pressure; SD=Standard deviation; \*SH stages according to the V Brazilian Guidelines of Hypertension; \*Kruskal-Wallis test for the comparison of means between groups.

cardiac arrhythmia; and e) in the “environment” domain: family history of cardiovascular disease (CVD).

In the analysis of correlation (Spearman’s r) of HRQOL with age, years of schooling and time of diagnosis of SH variables, age did not show significant correlation ( $p > 0.10$ ), years of formal schooling had a borderline correlation ( $r = 0.134$ ;  $p = 0.065$ ) with the WHOQOL-Bref “psychological” domain, and time of diagnosis of SH had a significant negative correlation with the total Minichal score ( $r = -0.149$ ;  $p < 0.05$ ) and borderline correlation with the Minichal “mental status” domain ( $r = -0.139$ ;  $p = 0.56$ ).

Minichal (including its domains taken separately) showed a significant correlation with WHOQOL-Bref in all its domains, except for the “environment” domain, which did not correlate with the Minichal “somatic manifestations” domain. The WHOQOL-Bref “physical” domain was the one that best correlated with Minichal, both regarding the total score and the “mental status” and “somatic manifestations” domains (Table 4).

## Discussion

Because of the characteristics of the place where the research was conducted, the level of educational attainment of the study participants was low (only three years of formal schooling, on average). In other HRQOL studies, Robbins et al found 12.3 years of formal schooling<sup>19</sup>, and Lalonde et al did not report patients with level of educational attainment lower than high school (secondary school)<sup>20</sup>. The study including participants with the lower level of educational attainment found was conducted in Egypt by Youssef et al<sup>2</sup>, in which 40.2% of the population had no formal schooling and 12.3% had elementary schooling.

In the analysis of BMI, a large proportion of the patients presented overweight (38.9%); weight was within normal limits

(BMI < 25) in only one fourth of them (24.7%). An increase in the prevalence of hypertension occurs with the increase in overweight and obesity in the population<sup>21</sup>; obesity is the major cause of hypertension, and results from the Framingham Heart Study suggest that approximately 78% of the cases of hypertension in men and 65% in women are attributed to obesity<sup>22</sup>. Therefore, special attention to the HRQOL of this population should be given because of this important factor.

As regards blood pressure control (<140/90 mmHg), the rate of patients with non-controlled blood pressure who were taking antihypertensive medication (69.6%) was close to that of a WHO document on hypertension, in which three fourths of the patients with SH were reported not to achieve optimal blood pressure control<sup>23</sup>. In Brazil, prevalence studies that report patients with controlled blood pressure by means of antihypertensive treatment show rates ranging from 10.4% to 33%<sup>24,25</sup>.

The medications most widely used by the study patients (captopril, hydrochlorothiazide and nifedipine) are available at no charge in the public health care network and are part of the National List of Essential Medications (*Relação Nacional de Medicamentos Essenciais - Rename*).

There were differences in the quality of life assessment between men and women as analyzed by Minichal in all its domains. A similar result was obtained in another study<sup>12</sup>. In the comparative analysis of the means, no significant difference was found between patients with controlled and non-controlled BP, unlike in Youssef et al<sup>2</sup> study, in which blood pressure control was a predictor of a better HRQOL. Robbins et al<sup>19</sup> demonstrated an inverse relation between BP levels and the “cognitive function” domain of HRQOL, thus corroborating previous studies<sup>19,26,27</sup>. In the validation study of the original Minichal, no differences were found between the means in the different stages of hypertension, same as in the present study<sup>12,28</sup>.

**Table 3 – Health-related quality of life according to gender, cardiovascular risk factors and comorbidities**

Variable	n	MINICHAL					WHOQOL-Bref				
		Total of the instrument Mean (SD)	Mental status Mean (SD)	Somatic Manifestations Mean (SD)	Physical Mean (SD)	Psychological Mean (SD)	Social Mean (SD)	Environment Mean (SD)			
Gender	Male	76.7 (17.1) <sup>†</sup>	76.9 (20.1) <sup>†</sup>	77.2 (20.8) <sup>†</sup>	64.4 (17.6)	71.1 (13.4)	75.3 (11.1)	61.1 (15.0)			
	Female	67.1 (19.3) <sup>†</sup>	66.3 (21.2) <sup>†</sup>	67.1 (23.9) <sup>†</sup>	60.5 (17.6)	63.7 (18.2)	71.2 (16.9)	59.2 (13.8)			
Diabetes	No	69.8 (19.2)	67.9 (22.2)	72.2 (21.80) <sup>†</sup>	62.3 (17.5)	66.0 (17.9)	72.0 (16.5)	59.6 (14.4)			
	Yes	69.3 (19.3)	72.7 (18.6)	63.2 (26.9) <sup>†</sup>	59.1 (17.9)	64.7 (15.7)	73.0 (12.9)	60.0 (13.6)			
Dyslipidemia	No	71.4 (18.3)	70.5 (21.3)	72.5 (22.5) <sup>†</sup>	62.7 (17.7)	67.2 (17.2)	72.7 (14.9)	60.6 (13.9)			
	Yes	66.4 (20.6)	66.6 (21.5)	64.9 (24.7) <sup>†</sup>	59.1 (17.5)	62.6 (17.4)	71.6 (17.0)	58.0 (14.6)			
Heart failure	No	71.1 (18.5) <sup>†</sup>	70.4 (20.9) <sup>†</sup>	71.5 (22.9) <sup>†</sup>	62.6 (17.8) <sup>†</sup>	66.8 (16.7) <sup>†</sup>	72.4 (15.7)	60.4 (14.2)			
	Yes	58.5 (21.2) <sup>†</sup>	59.5 (23.1) <sup>†</sup>	57.6 (24.8) <sup>†</sup>	52.6 (13.4) <sup>†</sup>	56.7 (20.0) <sup>†</sup>	71.2 (15.5)	54.6 (13.1)			
Cardiac arrhythmia	No	70.7 (19.2)	69.6 (21.9)	71.8 (22.4)	62.4 (18.0)	66.1 (17.7) <sup>†</sup>	72.8 (15.5)	60.5 (14.2)			
	Yes	63.7 (18.6)	66.4 (18.0)	58.4 (27.2)	55.8 (14.3)	63.0 (15.1) <sup>†</sup>	69.2 (16.1)	55.2 (12.8)			
Obesity	No	71.5 (18.4)	70.0 (21.0)	73.5 (23.0) <sup>†</sup>	63.7 (18.2) <sup>†</sup>	65.4 (15.9)	73.6 (14.5)	59.3 (14.4)			
	Yes	66.8 (20.3)	67.8 (22.2)	63.8 (23.4) <sup>†</sup>	57.7 (16.1) <sup>†</sup>	65.8 (19.6)	70.0 (17.3)	60.3 (13.7)			
Depression	No	72.7 (17.5) <sup>*</sup>	72.1 (19.7) <sup>†</sup>	73.0 (22.4) <sup>†</sup>	64.1 (16.3) <sup>†</sup>	68.4 (16.3) <sup>*</sup>	73.9 (15.2) <sup>†</sup>	61.5 (13.9) <sup>†</sup>			
	Yes	59.3 (21.4) <sup>*</sup>	58.9 (23.8) <sup>†</sup>	59.0 (24.3) <sup>†</sup>	52.7 (19.1) <sup>†</sup>	56.6 (17.9) <sup>*</sup>	66.7 (16.0) <sup>†</sup>	53.7 (13.4) <sup>†</sup>			
Family history of CVD	No	70.8 (18.3)	69.9 (21.5)	71.9 (21.7)	62.1 (16.8)	66.2 (17.1)	72.6 (15.5)	61.0 (14.3) <sup>†</sup>			
	Yes	66.5 (21.4)	67.0 (21.3)	64.3 (27.5)	59.9 (19.9)	64.5 (18.1)	71.8 (16.2)	56.1 (13.1) <sup>†</sup>			

SD, standard deviation; Mann Whitney U test; \*p<0.001 †p<0.01 ‡p<0.05

Table 4 – Correlation between Minichal and WHOQOL-Bref

		Total Minichal	Minichal Mental status	Minichal Somatic manifestations	WHOQOL Physical	WHOQOL Psychological	WHOQOL Social	WHOQOL Environment
Total Minichal	r*	--	0.917 <sup>‡</sup>	0.791 <sup>‡</sup>	0.629 <sup>‡</sup>	0.424 <sup>‡</sup>	0.391 <sup>‡</sup>	0.332 <sup>‡</sup>
Minichal mental status	r*	--	--	0.520 <sup>‡</sup>	0.534 <sup>‡</sup>	0.442 <sup>‡</sup>	0.427 <sup>‡</sup>	0.389 <sup>‡</sup>
Minichal somatic manifestations	r*	--	--	--	0.547 <sup>‡</sup>	0.257 <sup>‡</sup>	0.207 <sup>‡</sup>	0.127

\*Spearman's correlation coefficient; <sup>‡</sup>p<0.01; <sup>‡‡</sup>p<0.001

As for the analysis of internal consistency, Cronbach's  $\alpha$  was considered acceptable ( $\alpha > 0.70$ ) in the different Minichal domains; desirable values should be between 0.50 and 0.70 for the comparison between groups, and 0.85-0.95 for the comparison between individuals<sup>29</sup>. In the validation study for Brazil, as well as in the original study for the development of Minichal, the "mental status" and "somatic manifestations" domains showed  $\alpha$  values of 0.87 and 0.75 in the original study, and 0.88 and 0.86 in the Brazilian study<sup>9,12</sup>, respectively. The difference in the results obtained in the two studies conducted in Brazil may be related to the level of educational attainment of the patients. In Schulz et al<sup>9</sup> study, the patients had a higher level of educational attainment, with 36% of the hypertensive patients and 80% of the normotensive individuals with higher education<sup>9</sup>.

As already observed by other researchers, in our study, the clinical and sociodemographic variables influenced HRQOL (Table 3). Factors such as female gender, obesity, lower age range and lower level of educational attainment seem to be related to a worse QoL assessment<sup>30</sup>. This was also observed in the original Minichal study, in which women had a worse score in the "mental status" domain<sup>28</sup>. This relationship is described by different authors in the literature<sup>2,28,31</sup>. Women more frequently report feelings of dissatisfaction and frustration, which influences the HRQOL, especially in the "psychological" domain<sup>31</sup>. Also, men have a greater ability to tolerate chronic diseases without being emotionally affected<sup>2</sup>.

As regards obesity, some studies<sup>32,33</sup> reported the relationship between obese patients and a worse perception of HRQOL. In Fletcher et al's study<sup>33</sup>, this relation was observed among women. Grimm et al's study<sup>30</sup> showed that a better diet and weight loss were related to a better HRQOL.

The longer the time of diagnosis of hypertension, the lower the HRQOL assessment as measured by Minichal, especially regarding the total score and the "mental status" domain. Robbins et al<sup>19</sup> also observed this relationship among women. However, Youssef et al<sup>2</sup> analyzed this relationship in a model including other parameters such as age and did not find a statistically significant correlation between time of diagnosis of hypertension and QoL.

In the present study, the age range and age did not correlate with any of the HRQOL instruments used. Other

studies have found conflicting results in the assessment of the relationship between QoL and age. Youssef et al<sup>2</sup> reported that younger individuals had a better HRQOL, whereas Grimm et al<sup>30</sup> observed a better HRQOL in the elderly.

Patients with comorbidities such as diabetes, dyslipidemias, heart failure and depression show worse assessment of the quality of life in the Minichal "somatic manifestations" domain. This result is justified, because the symptoms explored in this Minichal domain may be linked to diseases and treatments other than hypertension or use of antihypertensives. Heart failure and depression also affect QoL in the Minichal "mental status" domain.

Individuals diagnosed with depression showed worse quality of life assessment both in Minichal and in all WHOQOL-Bref domains. This underscores the strong impact of depression on the HRQOL of patients, as had already been observed in the Epidemiological Follow-Up Study (NHEFS) of the first National Health and Nutrition Examination Survey (NHANES I)<sup>34</sup>.

As for the analysis of concurrent validity of Minichal-Brazil, by means of the correlation indexes it may be verified that in the "psychological" domain (WHOQOL-Bref) and "mental status" (Minichal) domain there was a moderate correlation ( $r=0.442$ ;  $p<0.001$ ), that was also observed in the "physical" (WHOQOL-Bref) and "somatic manifestations" (Minichal) domains ( $r=0.547$ ;  $p<0.001$ ). The moderate correlation obtained between these domains indicates that these scales measure concepts that are related, distinguishable and not redundant, thus confirming the concurrent validity.

With base on these results, it is not possible to conclude that Minichal should be used as a substitute for WHOQOL-Bref for quality of life assessment. Minichal is a tool that can be used as a complement for quality of life assessment of hypertensive patients, especially for studies focused on verifying the impact of a health intervention on this parameter.

Finally, the correlation between the sociodemographic variables and Minichal-Brazil observed in the present study, same as in the Spanish study<sup>28</sup>, helps demonstrate that this instrument is well adapted to Brazil. Also, this instrument

can be used both in populations with high and low levels of educational attainment.

## Conclusion

Minichal-Brazil proved to be a useful instrument for the QoL assessment in hypertensive patients, and its results are consistent with measurements obtained with generic instruments such as WHOQOL-Bref. These HRQOL measurements may be useful to help choose the best treatment for hypertensive patients, as well as in population-based studies assessing the determinants of QoL in these patients.

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