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Depression as a determinant of quality of life in patients with chronic disease: data from Brazil

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Abstract
Background Depressive symptoms are associated with impaired quality of life (QOL). However, there are scarce data comparing the magnitude of depression on QOL among persons with different chronic diseases in developing countries. This study aimed to evaluate the impact of depression on QOL in patients with ischemic heart disease (IHD) and end-stage renal disease (ESRD) in hemodialysis.
Methods Cross-sectional survey conducted in 173 patients: 103 with IHD and 70 in hemodialysis. Depression was diagnosed by the Mini International Neuropsychiatric Interview-5.0 and depressive symptoms measured by Beck Depression Inventory. QOL was assessed through the Short-Form-36 (SF-36) and World Health Organization Quality of Life Instrument-brief (WHOQOL-brief). Multivariate analyses were performed to assess the association between variables and QOL.
Results Depression prevalence was 14.3% among IHD patients and 9.9% in the hemodialysis group, and depressive symptoms were present in 39 and 36%, respectively. Regardless of the chronic condition, depressed patients presented lower QOL scores than non-depressed ones in all domains, and the most affected were role emotional, mental health and social functioning of SF-36, and psychological domain of WHOQOL-brief. In linear regression analysis, depressive symptoms were predictive for lower QOL in all domains, with the highest standardized beta coefficients (ranging from −0.26 to −0.64).
Conclusion Depression is an independent factor associated with worse QOL in IHD and ESRD patients. Among the priorities aiming at improving QOL must be evaluation and management of depressive symptoms.

Keywords Quality of Life · Depression · Comorbities · Ischemic heart disease · Hemodialysis

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Introduction

The relationship between depression, chronic conditions, and quality of life (QOL) has been studied in many physical diseases [13], including populations with ischemic heart disease (IHD) and end-stage renal disease (ESRD). The prevalence of depression in both groups seems to be higher than in the general population, ranging from 15 to 50% in patients with IHD [24, 26, 34] and 6 to 50% in ESRD [9, 18, 21, 36]. Besides these high estimates, depression has been strongly associated with worse prognosis, health status, and quality of life. Among patients with coronary artery disease, depression was described to be as important as cardiac function in the QOL [27, 31] and one of the main predictive factors of poor mental and

physical health status [25]. Moreover, depressive symptoms have been related to lower adherence to treatments [23].

The impact of depression on QOL has been demonstrated in patients with ESRD as well. Some authors have found that depressive symptoms were more related with QOL than with measures of dialysis adequacy [30], other demographic variables, and low hemoglobin levels [35].

In this context, the aim of this study was to evaluate the association between depression and QOL in chronic diseases. Although most studies assessed this association in a single disease, it is unknown whether the relationship between depression and QOL is similar across different chronic conditions. Our study compared the impact of depression on QOL in two groups of patients, IHD and ESRD in hemodialysis. We had a particular interest to compare this relationship in different diseases populations, to evaluate how much the nature of the chronic illness could influence QOL.

In addition, the study was conducted in a heterogeneous population from a developing country. We hypothesized that some results could be different from the results founded in developed countries, considering the multidimensional nature of quality of life measurement. Probably, diagnoses could be made in a similar manner in Brazil or United Kingdom in the same way, but their quality of life, perception, and satisfaction with your own health state not necessarily would be the same, depending on the availability of drugs, health care, and social support, for example. Our intention was to contribute with data that would help future comparative research among countries. Moreover, it provides information on contemporary prevalence of depression and depressive symptoms in IHD and ESRD in a developing country.

Methods

Study population

A cross-sectional survey was conducted in two samples: patients with IHD and patients with ESRD undergoing hemodialysis. Patients with IHD were enrolled from an outpatient cardiology clinic at a university hospital and patients with renal disease were enrolled from three hemodialysis units in Porto Alegre, Brazil. Inclusion criteria included the documented myocardial infarction, prior coronary artery bypass surgery or percutaneous coronary intervention more than 3 months earlier and no renal disease for the cardiac disease group; hemodialysis therapy for more than 3 months and no cardiac disease for patients with renal disease. Exclusion criteria included the presence of other disabling chronic diseases, such as cancer, chronic obstructive pulmonary disease, rheumatologic diseases, stroke, epilepsy, chronic hepatitis, AIDS, type 1 diabetes mellitus, but not type 2 diabetes mellitus, and intellectual inability to answer the questionnaires. In both groups, patients were stable in clinical status. This study was approved by the University Institutional Ethics Research Committee and all participants signed a written consent form.

Depression assessment

Depression was evaluated through the Mini International Neuropsychiatric Interview 5.0 (MINI) [29] and the Beck Depression Inventory (BDI) [5] both translated and validated for Portuguese [3, 14]. The MINI is a brief standardized diagnostic interview, which is compatible with the criteria of DSM and ICD-10. It generates a positive diagnosis of the main psychotic and mood disorders for current and lifetime episodes. The instrument is organized in diagnostic modules, designed to optimize the sensitivity of the instrument. In this study, only the mood and psychotic disorders sections were used to reduce the interview length. The prevalence of major depression was assessed by the MINI instrument. However, the impact of depression on quality of life was explored by the presence of depressive symptoms evaluated by the BDI. BDI is a self-assessment depression measure. It was not designed to generate a diagnosis, but to screen depressive symptoms in non-diagnosed populations or to identify the intensity of diagnosed depressive episodes. The intensity of depressive symptoms was classified according to the score obtained: 0−11 minimal depression, 12–19 mild depression, 20–35 moderate depression, and 36–63 severe depression. BDI assessed depressive symptoms in the prior 2 weeks. Based on the Brazilian standardized values, individuals presenting scores equal to or lower than 11 are not considered depressed [14].

Quality of life instruments

The main outcome was quality of life assessed through the Medical Outcomes Study Short-Form 36 (SF-36) [37] and the World Health Organization Quality of Life Instrument-brief (WHOQOL-brief) [32], both instruments translated and validated for Portuguese [8, 11]. The SF-36 is a generic instrument. Its conceptual basis is health-related quality of life. This construct is represented by 35 questions divided in eight domains: physical functioning, role physical, bodily pain, general health status, vitality, role social, role emotional, and mental health. The scores range from 0 to 100, 0 being the worst and 100 being the best health status. The WHOQOL-brief is an abridged version of the generic instrument of QOL assessment of the World Health

Organization. This measurement is based on the concept of QOL defined by the WHO, and it comprises 26 questions, two general questions about quality of life and other 24 questions divided into four domains: physical, psychological, social relationships, and environment. The final score also ranges from 0 to 100, with 0 being the least favorable quality of life and 100 being the most favorable one.

The reason why the SF-36 and the WHOQOL-brief were chosen is that these instruments are generic, which makes it possible to compare the groups with different diagnosis. They have also been validated for the Brazilian population, besides being easy to administer and widely used in Brazil. The use of both generic instruments in the same study aimed to assess both health-related quality of life and overall quality of life, measured by SF-36 and WHOQOL-brief, respectively.

Data collection

Patients with IHD were invited to participate during an appointment at the outpatient cardiology clinic in consecutive days. First, demographic and clinical data were obtained from patient's history and medical record. Next, the semi-structured psychiatric interview was performed (MINI) by a trained researcher to diagnose depression. In the next step, patients self-completed the questionnaires SF-36, WHOQOL-brief, and BDI. For illiterate patients ($n = 2$), the instruments were administered by the interviewer.

The order in which the instruments were applied was strictly respected, which guaranteed that the researcher was blinded regarding the participants' answers to the depression screening instrument (BDI) while administering the diagnostic interview. The research protocol for the group of patients with renal disease was similar. Patients were invited to participate during hemodialysis sessions.

Statistical analysis

Continuous data are expressed as mean ± standard deviation and categorical in percentage. Chi-square test was used to verify the association of demographic characteristics with two groups of clinical diseases and between patients with and without depressive symptoms. The differences between continuous variables were compared by the Student's t test. Comparisons between QOL scores and the two groups studied, and between patients with and without depressive symptoms were performed by ANOVA.

Multivariate analyses were performed to assess the relationship between independent variables and QOL. Models were generated for each domain of the instruments SF-36 and WHOOQL-brief as dependent variables and all other demographic (age, gender, marital status, professional status, schooling, and family income) and clinical characteristics (type 2 diabetes mellitus, hospital admission in the previous month, and smoking), heart and renal disease, and depressive symptoms as independent ones. Multiple linear regression was performed. To present more concise tables, just the variables which were significant at least in one domain of each instrument were described in the tables. For all tests, a significance was established at a p value of <0.05. Data were analyzed using SPSS for Windows, version 11.5.

Results

Sample characteristics

From August 2004 to July 2005, 190 patients were invited to participate in the study. Two patients refused to participate; ten patients in the hemodialysis group and five patients with heart disease did not return their completed questionnaires and were excluded; 173 patients were included, 103 had a diagnosis of IHD, and 70 were undergoing hemodialysis.

Demographic and clinical characteristics of the population are described in Table 1. Among 103 patients with heart disease, 74% had prior myocardial infarction, 42% had been submitted to coronary artery bypass surgery, and 38% had been submitted to a percutaneous angioplasty. The drugs more frequently used were statins (85%), β-blockers (81%), acetylsalicylic acid (80%), and angiotensin-converting enzyme inhibitors (ACEI) (74%). New York Heart Association functional classes I, II, III, and IV were present in 35, 28, 22, and 15% of these patients, respectively.

Among hemodialysis patients, causes of renal failure were hypertensive nephropathy (24%), followed by diabetic nephropathy (14%), unknown etiology (18%), polycystic kidney disease (10%), and varied other causes (34%). The drugs most frequently used were calcium carbonate (78%), folic acid (75%), and erythropoietin (72%).

The comparisons of the demographic characteristics between the group of patients with heart disease and the group of patients with renal disease showed a statistically significant difference regarding mean age and a statistically significant association with schooling and family income. Patients with renal disease were younger, had better educational level and higher family income. The distribution regarding gender, marital status, professional status, smoking, and concomitant diagnosis of type 2 diabetes mellitus was similar in both groups. Patients in hemodialysis presented a lower hemoglobin level comparing to patients with cardiac disease as expected, considering the nature of their disease (Table 1).

Table 1 Clinical and demographic characteristics according to chronic disease diagnoses and to the presence of depressive symptoms

Variable	Ischemic heart disease ($N = 103$)		Renal disease ($N = 70$)		p value for comparison of two diseases
	With depressive symptoms N (%)	Without depressive symptoms N (%)	With depressive symptoms N (%)	Without depressive symptoms N (%)	
Mean age (SD), years	60 (11)	61 (10)	52 (14)	54 (14)	<0.01
Male gender	18 (45)	42 (67)†	14 (56)	30 (67)	0.6
Marital status					
Married	22 (55)	45 (71)*	13 (52)	32 (71)*	0.9
Not married	18 (45)	18 (29)	12 (48)	13 (29)	
Professional status					
Retired	34 (85)	43 (68)*	24 (96)	35 (78)†	0.1
Active	6 (15)	20 (32)	1 (4)	10 (22)	
Schooling					
Up to 4th grade (elementary school)	17 (42.5)	23 (36.5)	3 (12)	6 (13)	<0.01
5th–8th grade (elementary school)	13 (32.5)	23 (36.5)	6 (24)	12 (27)	
1st–3rd grade (high school)	10 (25)	11 (17.5)	12 (48)	15 (33)	
College	0 (0)	6 (9.5)	4 (16)	12 (27)	
Family income					
Up to 4 minimum salaries[a]	30 (75)	37 (59)*	14 (56)	16 (36)*	<0.01
5 minimum salaries or more	10 (25)	26 (41)	11 (44)	29 (64)	
Smoking	6 (15)	4 (6)	1 (4)	5 (11)	0.8
Type 2 diabetes mellitus	16 (40)	15 (24)*	10 (40)	8 (18)†	0.5
Hospitalization in the last month	5 (12.5)	1 (2)†	7 (28)	3 (7)†	0.06
Duration of the disease in years [mean (SD)]	5 (4)	6 (6)	8 (7)	5 (6)	0.7
Hemoglobin level, g/dl [mean (SD)]	13 (1)	13 (2)	10 (2)	10 (2)	<0.01

[a] Minimum salary in Brazil is equivalent to approximately $200

* $p < 0.01$ and † $p < 0.05$ for comparison between patients with and without depressive symptoms

Depression and depressive symptoms

The prevalence of major depression was similar between chronic disease groups, 14.3% (CI 95% 7–21) in heart disease and 9.9% (CI 95% 3–17) in renal disease patients ($\chi^2 = 0.4$; $p = 0.49$). The intensity of the depressive episode was also not significantly different between the groups (Fig. 1). Only 20% of patients with cardiac disease and 29% diagnosed with major depression were on treatment with antidepressants. All these patients were taking serotonin-reuptake inhibitors in both the groups. Twenty-eight percentage of renal patients were taking benzodiazepines as well.

There was no significant difference between the groups of patients with IHD and with ESRD in relation to the presence of depressive symptoms. When considering a BDI score greater than 11, 39% of the patients with heart disease and 36% of the patients with renal disease had depressive symptoms ($\chi^2 = 0.7$; $p = 0.75$). Sixty-two percentage of cardiac patients and 72% of renal patients with a BDI score >11 did not fulfill diagnostic criteria for major depression in the standardized interview On the other hand, 100% of patients in both groups of diseases with BDI scores higher than 35 fulfilled diagnostic criteria for depression. The distribution of BDI scores was 62.4% 0–11; 21.4% 12–19; 13.3% 20–35; 2.9% 35–63. The demographic characteristics of patients with and without depressive symptoms in each disease are described in Table 1.

Several patients diagnosed as being depressed during this study had not been previously diagnosed. Among patients with a positive diagnosis of depression, determined by MINI, 43% of patients with renal disease and 53% with heart disease had not been previously diagnosed.

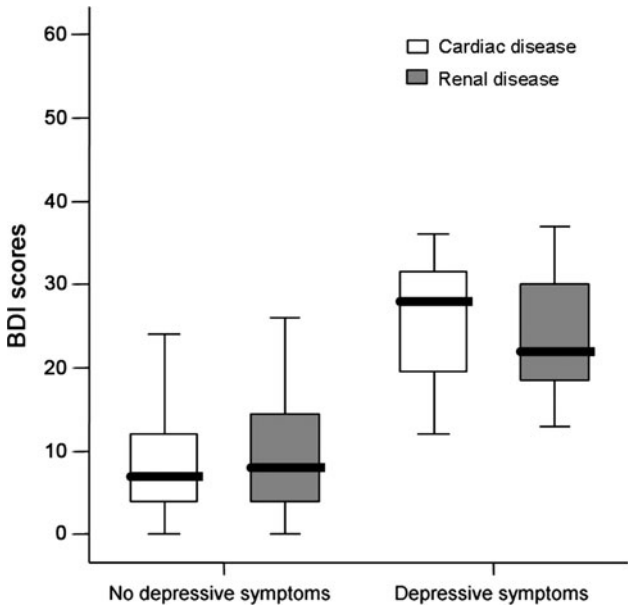

Fig. 1 Boxplot of Beck Depression Inventory (BDI) values of patients with and without depressive symptoms in both chronic disease conditions. The *middle line* represents the medians of BDI scores in both groups and the *box* the interquartile range of scores

Quality of life

When comparing QOL scores of patients with and without depressive symptoms in each group, depressed patients had lower values for all domains in both instruments, and the most significant differences, more than 30 points, were observed in role emotional, mental health and social functioning domains of the SF-36, and social relationships of the WHOQOL-brief. The scores of each domain of QOL instruments are described in Table 2.

In the analysis of variance, there was a statistically significant difference between patients with or without depressive symptoms in both groups for all domains of the SF-36 and the WHOQOL-brief (Table 2). Quality of life scores were similar between patients with heart and renal disease, and there was no interaction between the diagnosis of chronic disease and depressive symptoms influencing QOL scores.

Multivariate analysis

To assess the effect of depression on QOL, multiple linear regression analyses were performed. Each domain of the SF-36 and the WHOQOL-brief instrument was the dependent variable and the following independent variables were included in the model: depressive symptoms, age, gender, marital status, schooling, professional status, family income, smoking, type 2 diabetes mellitus, hospital admission in the previous month, time since onset of disease, and diagnostic group (heart or renal disease). The standardized beta coefficient was used to demonstrate the relative importance of each independent variable in the model.

In the linear regression analysis of SF-36 domains, the demographic variable predictors of lower QOL are demonstrated on Table 3. These variables were associated with low QOL in some, but not all domains. Type 2 diabetes mellitus was the only clinical variable associated with poor QOL in the general health status domain. Depressive symptoms were predictive for lower QOL in all domains of SF-36, with the highest standardized beta coefficients (ranging from −0.26 to −0.64). Depression was the independent variable, with the highest relative importance among all variables studied in the association with poor QOL.

In the WHOQOL-brief instrument, the only demographic variables inversely associated with QOL were age and low schooling (Table 4). Again, depressive symptoms were inversely associated with QOL in all domains, with the highest standardized beta coefficients.

Afterward, we replace depressive symptoms by the diagnosis of depression made by MINI in the models to verify that the association previously observed would not change. Depression continued to be the most predictive variable for lower QOL, showing higher standardized beta coefficients than all other variables, ranging from −0.25 to −0.51 for the SF-36 and from −0.34 to −0.40 for the WHOQOL-brief. However, the coefficients in the WHOQOL-brief were lower than that ones observed in the models containing the variable "depressive symptoms".

Discussion

In this study, we observed that among patients with IHD and ESRD depressive symptoms are a prevalent condition strongly associated with poor quality of life scores, even after the adjustment for other clinical, social, and economic variables.

The prevalence of major depression related to heart disease, as well as depressive symptoms, in these Southern Brazilian patients, is similar to that reported in the international literature, ranging from 15 to 27% for the diagnosis of depression [24], and from 17 to 65% for the presence of depressive symptoms [26]. In patients undergoing hemodialysis, available data indicate prevalence in the range of 25–70%, when screening instruments for depressive symptoms [18] were used and from 6 to 18% when the DSM criteria were applied [17]. These findings are in agreement with the frequencies observed in our study. Despite the high prevalence, we observed that this condition is underdiagnosed in clinical practice, as

Table 2 Means (SD) of SF-36 and WHOQOL-brief scores in patients with ischemic heart and renal disease, stratified by the presence of depressive symptoms

	Ischemic heart disease		Renal disease		*p* Value		
	BDI ≤ 11 ($N = 63$)	BDI > 11 ($N = 40$)	BDI ≤ 11 ($N = 45$)	BDI > 11 ($N = 25$)	p*	$p^{\dagger}$	$p^{\ddagger}$
SF-36							
Physical functioning	65 (27)	49 (25)	63 (27)	37 (30)	<0.001	0.13	0.28
Role physical	49 (47)	26 (33)	44 (41)	14 (21)	<0.001	0.21	0.61
Bodily pain	61 (24)	42 (22)	62 (24)	43 (19)	<0.001	0.67	0.96
General health	58 (22)	44 (21)	60 (21)	38 (22)	<0.001	0.59	0.29
Vitality	62 (21)	34 (21)	67 (18)	37 (19)	<0.001	0.26	0.74
Social functioning	82 (19)	51 (24)	81 (24)	51 (28)	<0.001	0.93	0.85
Role emotional	58 (42)	28 (39)	66 (42)	24 (34)	<0.001	0.78	0.39
Mental health	75 (18)	44 (19)	80 (17)	49 (17)	<0.001	0.08	0.89
WHOQOL-brief							
Physical	60 (11)	45 (12)	57 (12)	49 (12)	<0.001	0.80	0.08
Psychological	63 (11)	46 (17)	61 (12)	49 (12)	<0.001	0.86	0.21
Social relationships	72 (17)	48 (23)	72 (14)	51 (22)	<0.001	0.57	0.63
Environment	64 (12)	450 (15)	68 (12)	53 (14)	<0.001	0.09	0.78

* p value for the comparison between patients with and without depressive symptoms

† p value for the comparison between patients with heart and renal disease

‡ p value for the interaction between depressive symptoms and chronic disease diagnoses

Table 3 Linear regression analysis of the SF-36 domains, depressive symptoms, demographic and clinical variables

Variables	Physical functioning $R^2 = 0.29$	Role physical $R^2 = 0.15$	Bodily pain $R^2 = 0.21$	General health status $R^2 = 0.19$	Vitality $R^2 = 0.38$	Role social $R^2 = 0.27$	Role emotional $R^2 = 0.24$	Mental health $R^2 = 0.46$
Depressive symptoms	−0.26†	−0.27†	−0.39†	−0.38†	−0.56†	−0.52†	−0.43†	−0.64†
Female gender	−0.25†	–	−0.15*	–	−0.16*	–	–	−0.12*
Marital status-married	–	–	–	–	–	–	−0.14*	–
Professional status								
Retired	−0.23*	−0.18*	–	–	–	–	–	–
Schooling								
Up to 8th grade	–	–	–	–	–	–	−0.17*	–
Type 2 DM	–	–	–	−0.17*	–	–	–	–

Data are expressed as standardized beta coefficients

Variables entered in the model: age, gender, marital status, professional status, schooling and family income, type 2 diabetes mellitus, hospital admission in the previous month and smoking, heart or renal disease, and depressive symptoms

DM diabetes mellitus

* $p < 0.05$

† $p < 0.001$

previously documented by other authors [2]. Lespérance and Frasure-Smith, in a review on depression in coronary artery disease patients, have emphasized this aspect pointing out that among these patients, depression is not only under diagnosed, but also undertreated [20]. An important issue must be taken into account is the difficulty in screening depression in patients with chronic diseases. Cardiac or renal patients have common somatic symptoms as sleep disorders, appetite problems, and fatigue that could be produced by both, physical illness and depression, confounding the diagnosis. The instrument used to assess depressive symptoms (BDI) includes somatic items,

Table 4 Linear regression analyses of the domains of the WHOQOL-brief, depressive symptoms, demographic and clinical variables

Variables	Physical $R^2 = 0.41$	Psychological $R^2 = 0.38$	Social relationships $R^2 = 0.41$	Environment $R^2 = 0.35$
Depressive symptoms	−0.53†	−0.55†	−0.64†	−0.56†
Age	−0.30†	–	–	–
Schooling				
Up to 8th grade	–	–	−0.15*	−0.14*
Smoking	–	0.15*	–	–

Variables entered in the model: age, gender, marital status, professional status, schooling and family income, type 2 diabetes mellitus, hospital admission in the previous month and smoking, heart or renal disease, and depressive symptoms

* $p < 0.05$

† $p < 0.001$

causing a potential in increasing the prevalence of depressive symptoms. As an instrument to detect major depression, BDI presented a high false-positive rate. A shorter version of BDI excluding somatic items is available, but some authors have founded a high rate of false positive with this version as well. They observed that a single BDI cut-off score for both screening and diagnostic purposes may not be adequate for evaluating whether medical patients are significantly depressed or not [12]. To increase the cutoff point, we may increase the positive-predictive value of BDI to diagnose depression. In our sample, all patients with BDI scores higher than 35 were diagnosed with major depression by MINI. Besides, some authors have pointed out that the elimination of somatic items provides more specificity for the diagnosis of depression, but leads to the exclusion of patients with subclinical symptoms [24].

The negative association between depressive symptoms and QOL is pervasive, because all domains of both assessment instruments were affected either in patients in hemodialysis and patients with cardiac disease. By studying these populations considering each one of these diseases separately, other authors have also demonstrated differences of the scores means in instruments of quality of life between depressed and non-depressed patients [33, 36]. As it was expected, the domains related to mental health and psychological domains were the most affected ones, but the domains related to the social life of patients were also affected by a significant effect. The comparison of the means found in our study to the score means of the SF-36 in samples of the general Brazilian population [28] demonstrates that the patients' means in both diseases were lower in six domains of the instrument. An interesting fact is that in the mental health domain, the mean of the patients without depressive symptoms of our sample was higher than the mean of the general population, and in the social aspect domain the means were similar. The mean of the general population might have been reduced due to the presence of people with psychiatric symptoms in the sample. Therefore, it is important to consider the screening of emotional symptoms while assessing quality of life of a population. Data about the means of the WHOQOL-brief for the general population are not available yet in our country. When using the validation data of the WHOQOL-brief [11], and comparing them to our data, we observed that the means of the control group, which consisted of 50 people without chronic disease, were similar to the means found in our group of patients with both diseases, and the means were higher only in the physical domain. There is evidence that the presence of a chronic disease in the life of a person often leads to adjustments that preserve the satisfaction with life, and sick people can consider they have a good quality of life in some domains, even if they have severe limitations regarding their physical abilities. To infer that these people inevitably would have a worse quality of life would be a biased point of view [19]. On the other hand, the means of depressed patients in both the groups of diseases of our sample were lower in all domains comparing to the means of healthy subjects of studies samples mentioned above. Therefore, the depressive symptoms seem to cause more impact in quality of life than the physical disease. This information is consistent with the findings of the Medical Outcomes Study [37], which showed that the functioning of depressed patients was similar to or worse than the functioning of patients with chronic physical conditions. Besides, there were no interactions between depressive symptoms and chronic disease diagnosis suggesting that the presence of depression is associated with worse QOL independent of the nature of the physical disease.

Our findings are consistent with data reported by other authors considering depression as the variable most predictive of worse quality of life [24, 25, 30]. Because the construct of QOL measurements focuses on the person's satisfaction with his/her life, the presence of depressive symptoms could highly influence this perception, since

depressed patients have a negative self-assessment, from the world and the future [4, 15]. This may be one explanation for the higher standardized beta coefficients of depressive symptoms in the WHOQOL-brief than in the SF-36. Moreover, when we performed the analyses using the diagnosis of depression instead of depressive symptoms, the magnitudes of depression coefficients were lower, mainly in the WHOQOL-brief domains. The difference could be explained by the fact that the diagnosis of depression was a dichotomous variable, while BDI capture different levels of depression. As a continuous variable, BDI can explain the variance in the scores of QOL instruments more accurately. Furthermore, some authors founded a particularly high correlation between WHOQOL-brief and BDI scores, probably due to a measurement overlap between quality of life, as measured through WHOQOL-brief and depressive symptoms [1]. A number of items in the WHOQOL-brief and the BDI address the same phenomena (e.g., sadness, dissatisfaction, a low level of energy, insomnia, body image, and social withdrawal).

The cross-sectional design of our study does not permit determining as to whether depression causes poor QOL or reflects patients' underlying QOL, eroded by physical disease. Fayers et al. [10], suggest that depression could be both, a causal and effect indicator of QOL, depending on the domains evaluated. If an instrument assesses only domains related to well being and satisfaction, depression can behave as an effect indicator of QOL, because the relationship would be bidirectional, i.e., if their QOL is poor, patients probably will report themselves as depressed; if QOL is good, people probably will report not being depressed. However, we use multidimensional instruments that assess multiple aspects of QOL not related to psychological ones and the results showed that depressive symptoms had an important impact in domains of QOL beyond those related with mental health. We could hypothesize that depression is a causal indicator of poor QOL suggesting this question for further research.

Other studies have suggested that self-reports of patients with chronic physical diseases are linked to emotional status. Hence, when using QOL assessment in clinical care, reports of lowered QOL in such domains should be a "marker" of an underlying psychiatric condition, demanding a more detailed evaluation [10].

We should acknowledge some caveats in our study. It is a cross-sectional study. We did not control for disease severity or functional status, and since other comorbid conditions were excluded from the study this could limit the extrapolation of the results to patients with multiple comorbidities.

Conclusion

Our study reinforces the impression that being depressed worsens the quality of life regardless of the type of chronic illness. Our main contribution to the literature is to show the cross-cultural generalizability of this phenomenon. These findings highlight the importance of including the assessment and management of depression in the delivery of health care of patients with IHD and ESRD in hemodialysis.

References

1. Aigner M, Förster-Streffleur S, Prause W, Freidl M, Weiss M, Bach M (2006) What does the WHOQOL-Brief measure? Measurement overlap between quality of life and depressive symptomatology in chronic somatoform pain disorder. Soc Psychiatry Psychiatr Epidemiol 41:81–86
2. Amin A, Jones AMH, Nugent K, Rumsfeld JS, Spertus JA (2006) The prevalence of unrecognized depression in patients with acute coronary syndrome. Am Heart J 152:928–934
3. Amorim P (2000) Mini International Neuropsychiatric Interview (MINI): validation of a brief interview to diagnose mental disorders. Rev Bras Psiquiatr 22(3):106–115
4. Atkinson M, Zibin S, Chuang H (1997) Characterizing quality of life among patients with chronic mental illness: a critical examination of the self-report methodology. Am J Psychiatry 154:99–105
5. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh G (1961) An inventory for measuring depression. Arch Gen Psychiatry 4:53–63
6. Brown N, Melville M, Gray D, Young T, Munro J, Skene AM, Mampton JR (1999) Quality of life four years after acute myocardial infarction: short-form 36 scores compared with a normal population. Heart 81:352–358
7. Bush DE, Ziegelstein RC, Tayback M, Richter D, Stevens S, Zahalsky H, Fauerbach JA (2001) Even minimal symptoms of depression increase mortality risk after acute myocardial infarction. Am J Cardiol 88:337–341
8. Ciconelli RM, Ferraz MB, Santos W, Meinão I, Quaresma MR (1999) Brazilian–Portuguese version of the SF-36. A reliable and valid quality of life outcome measure. Rev Bras Reumatol 39(3):143–150
9. DeOreo PB (1997) Hemodialysis patient–assessed functional health status predicts continued survival, hospitalization, and dialysis-attendance compliance. Am J Kidney Dis 30(2):204–212
10. Fayers PM, Hand DJ, Bjordal K, Groenvold M (1997) Causal indicators in quality of life research. Qual Life Res 6:393–406
11. Fleck MPA, Louzada S, Xavier M, Chachamovich E, Vieira G, Santos L, Pinzon V (2000) Application of the Portuguese version of the abbreviated instrument of quality of life—WHOQOL-brief. Rev Saúde Pública 34(2):178–183
12. Furlanetto LM, Mendlowicz MV, Bueno JR (2005) The validity of Beck Depression Inventory-Short Form as a screening and diagnostic instrument for moderate and severe depression in medical inpatients. J Affect Disord 86(1):87–91
13. Gaynes BN, Burns BJ, Tweed DL, Erickson P (2002) Depression and health-related quality of life. J Nerv Ment Dis 190(12):799–806

14. Gorenstein C, Andrade L (1996) Validation of a Portuguese version of the beck depression inventory and the state-trait anxiety inventory in Brazilian subjects. Br J Med Biol Res 29:453–457
15. Jacobson AM, De Groot M, Samson JA (1997) The effects of psychiatric disorders and symptoms on quality of life in patients with Type I and Type II diabetes mellitus. Qual Life Res 6:11–20
16. Johnson J, Weissman MM, Klerman GL (1992) Service utilization and social morbidity associated with depressive symptoms in the community. JAMA 267(11):1478–1483
17. Kimmel PL, Thamer M, Richard C, Ray NF (1998) Psychiatric illness in patients with end-stage renal disease. Am J Med 105:214–221
18. Kimmel PL (2002) Depression in patients with chronic renal disease. What we know and what we need to know. J Psychosom Res 53:951–956
19. Leplege A, Hunt S (1997) The problem of quality of life in medicine. JAMA 278(1):47–50
20. Lespérance F, Frasure-Smith N (2000) Depression in Patients with cardiac disease: a practical review. J Psychosom Res 48:379–391
21. Lopes AA, Albert JM, Young EW, Stayathum S, Pisoni RL, Andreucci VE, Mapes DL, Mason NA, Fukuhara S, Wikstrom B, Saito A, Port FK (2004) Screening for depression in hemodialysis patients: Associations with diagnosis, treatment, and outcomes in the DOPPS. Kidney Int 66:2047–2053
22. Merkus MP, Jeger KJ, Dekker FW, Boeschoten EW, Stevens P, Krediet RT, The Necosad Study Group (1997) Quality of life in patients on chronic dialysis: self assessment 3 months after the start of treatment. Am J Kidney Dis 29(4):584–592
23. Rieckmann N, Kronish IM, Haas D, Gerin W, Chaplin WF, Burg MM, Vorchheimer D, Davidson KW (2006) Persistent depressive symptoms lower aspirin adherence after acute coronary syndromes. Am Heart J 152:922–927
24. Rudisch B, Nemeroff C (2003) Epidemiology of comorbid coronary artery disease and depression. Biol Psychiatry 54:227–240
25. Rumsfeld JS, Magid DJ, Plomondon ME, O'Brien MM, Spertus JA, Every NR, Sales AE (2001) Predictors of quality of life following acute coronary syndromes. Am J Cardiol 88:781–784
26. Rumsfeld JS, Magid DJ, Plomondon ME, Sales AE, Grunwald GK, Every NR, Spertus JA (2003) History of depression, angina, and quality of life after acute coronary syndromes. Am Heart J 145:493–499
27. Ruo B, Rumsfeld JS, Hlatky MA, Liu H, Browner ES, Whooley MA (2003) Depressive symptoms and health-related quality of life—the heart and soul study. JAMA 290:215–221
28. Sesso R, Rodrigues-Neto JF, Ferraz MB (2003) Impact of socioeconomic status on the quality of life of esrd patients. Am J Kidney Dis 41(1):186–195
29. Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, Hergueta T, Baker R, Dunbar GC (1998) The Mini-International Neuropsychiatric Interview (M.I.N.I): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. J Clin Psychiatry. 59 Suppl 20:22–33; quiz 34–57
30. Steele TE, Baltimore D, Finkelstein S, Juergensen P, Kliger AS, Finkelstein FO (1996) Quality of life in peritoneal dialysis patients. J Nerv Ment Dis 184(6):368–374
31. Swenson JR, O'Connor CM, Barton D, Van Zyl LT, Swedberg K, Forman LM, Gaffney M, Glassman AH, Sertraline Antidepressant Heart Attack Randomized Trial (SADHART) Group (2003) Influence of depression and effect of treatment with sertraline on quality of life after hospitalization for acute coronary syndrome. Am J Cardiol 92(11):1271–1276
32. The WHOQOL Group (1998) Development of the World Health Organization WHOQOL-brief quality of life assessment. Psychol Med 28:551–558
33. Torres MS, Calderón SM, Díaz IR, Chacón AB, Fernández FL, Martinez IF (2004) Health-related quality of life in coronary heart disease compared to norms in Spanish population. Qual Life Res 13:1401–1407
34. Valkamo M, Hintikka J, Niskanen L, Koivumaa-Honkanen H, Honkalampi K, Viinamaki H (2001) Depression and associated factors in coronary artery disease. Scand Cardiovasc J 35:259–263
35. Vázques I, Valderrábano F, Jofré R, Fort J, López-Gomez J, Moreno F, Sanz-Guajardo D (2003) Psychosocial factors and quality of life in young hemodialysis patients with low comorbidity. J Nephrol 16:886–894
36. Walters BAJ, Hays RD, Spritzer KL, Fridman M, Carter WB (2002) Health-related quality of life, depressive symptoms, anemia and malnutrition at hemodialysis initiation. Am J Kidney Dis 40(6):1185–1194
37. Ware JE, Sherbourne CD (1992) The MOS 36-item short-form health survey (SF-36) I. Conceptual framework and item selection. Med Care 30(6):473–481
38. Wells KB, Stewart A, Hays RD, Burnam A, Rogers W, Daniels M, Berry S, Greenfield S, Ware J (1989) The functioning and well-being of depressed patients—results from the medical outcomes study. JAMA 262(7):914–919