



Quality of life in adults and older adults with *Chagas* disease

Qualidade de vida em adultos e idosos com doença de Chagas

Yaeko OZAKI^{1,2}

Ernesta Lopes Ferreira DIAS^{1,2}

Eros Antonio de ALMEIDA^{1,2}

Maria Elena GUARIENTO^{1,2}

ABSTRACT

Objective

The objective was to evaluate the perceived quality of life of adult and older adult patients with different clinical forms of *Chagas* disease.

Methods

This descriptive and cross-sectional research was conducted between 2005 and 2008. Data were collected from 202 patients. The World Health Organization Quality of Life-BREF was used to assess the quality of life domains. Statistical analyses included descriptive analysis, and univariate and multivariate logistic regression analyses.

Results

Of the 202 interviewed patients, 53.96% were female; 68.81% were aged ≤ 60 years, 66.83% presented the cardiac form, 11.39% presented the digestive form, and 21.78%

¹ Universidade Estadual de Campinas, Faculdade de Ciências Médicas, Programa de Pós-Graduação em Gerontologia. R. Tessália Vieira de Camargo, 126, PO BOX 6111, Cidade Universitária Zeferino Vaz, 13083-970, Campinas, SP, Brasil. *Correspondência para/* Correspondence to: Y OZAKI. E-mail: <yaozaki@terra.com.br>.

² Universidade Estadual de Campinas, Faculdade de Ciências Médicas, Grupo de Estudos em Doenças de Chagas. Campinas, SP, Brasil. Article based on the master's thesis of OZAKI Y entitled "Quality of life and depressive symptoms in Chagas disease patients attended at Group for Research on Chagas Disease". Universidade Estadual de Campinas; 2008 and ELF DIAS entitled "Quality of life of adults and elderly patients with Chagas Disease". Universidade Estadual de Campinas; 2009.

had the indeterminate form. Patients with the cardiac and digestive forms were more likely to report lower quality of life in the physical, psychological, and social relationships domains than those with the indeterminate form. In the environment domain, women and those with more comorbidities had lower scores.

Conclusion

The social relationships domain received the highest scores, followed by the psychological and physical domains. The environment domain received the lowest scores. Comparing the scores of the World Health Organization Quality of Life-BREF domains by age group (adults and older adults) in relation to the clinical form, gender, and number of comorbidities, quality of life did not differ significantly in any of the study subgroups.

Keywords: Aged. Chagas disease. Quality of life.

RESUMO

Objetivo

Avaliar a percepção da qualidade de vida em pacientes adultos e idosos nas diferentes formas clínicas da doença de Chagas.

Métodos

Trata-se de estudo descritivo e transversal realizado entre 2005 e 2008. A amostra por conveniência foi composta de 202 pacientes. Utilizou-se o World Health Organization Quality of Life-BREF para avaliar os domínios da qualidade de vida. A análise estatística foi realizada por meio de análises descritiva e de regressão logística univariada e multivariada.

Resultados

Do total da amostra, 53,96% eram mulheres; 68,81% tinham idade ≤ 60 anos, 68,83% apresentavam a forma cardíaca; 11,39% a digestiva; e 21,78% a indeterminada. Portadores das formas cardíaca e digestiva evidenciaram maior chance de relatar baixa qualidade de vida nos domínios físico, psicológico e das relações sociais quando comparados aos pacientes com a forma indeterminada. No domínio do meio ambiente, as mulheres e os que tinham maior número de comorbidades apresentaram pontuação mais baixa.

Conclusão

O domínio das relações sociais foi o melhor avaliado, seguido pelos domínios psicológico e físico. Já o do meio ambiente foi o pior avaliado. Comparando os escores dos domínios do World Health Organization Quality of Life--BREF com a faixa etária (adultos e idosos) em relação à forma clínica, ao gênero e ao número de comorbidades, nenhuma diferença significativa foi encontrada em qualquer um dos subgrupos estudados.

Palavras-chave: Idoso. Doença de Chagas. Qualidade de vida.

INTRODUCTION

According to the Pan American Health Organization/World Health (PAHO/WHO)¹, after more than a century of its discovery in 1909, Chagas disease is still a neglected disease. Chagas disease

was cited in the first report on neglected tropical diseases that lack effective and appropriate treatments. It is also mentioned that these diseases require research strategies for the development and implementation of new medication, new methods of vector control, and diagnostics that are accessible

to patients in their needs². There are estimates of 12 to 14 million infected patients in 21 endemic countries¹.

The epidemiological condition of *Chagas* disease in Brazil has been modified as a result of control actions and environmental, economic, and social changes that happened in previous decades³, that is, the domiciliary vectorial transmission was interrupted and transfusion transmission tends to disappear. As a result, congenital transmission also tends to disappear³. Therefore, Brazil has the challenge of caring for chronic patients, many already old or due to become old in the near future⁴. When defining the mortality profile from infectious and parasitic diseases in the population aged over 65 years in Brazil, Paes⁵ argues that between 1980 and 1990, *Chagas* disease caused the highest percentage of deaths in the country; mortality rates followed a downward trend following the drastic reduction of the transmission of this disease as a result of control programs and urbanization process, since the disease was being spread mainly among the rural population.

Chagas disease is still nowadays an important cultural, social, and political problem which involves public health issues⁶. It is surrounded by stigmas and cultural values that affect social and economic relations of *Chagas* disease patients, and its impact affects the social and psychological contexts, limiting quality of life⁷.

Population aging is a global trend characterized by increased life expectancy. Along with longevity, it would be really wonderful if we would have better Quality of Life (QoL). The World Health Organization Quality of Life (WHOQOL) defined QoL as the perception that a person has of their position in life in the context of the culture and value system in which they live, in relation to goals, expectations, standards, and concerns⁸. In this sense, QoL is a subjective concept and depends on self-perception. The aging process could result in increased chronic disease, and consequently, it could impact perceived quality of life. The association of chronic degenerative diseases common in older adults with a chronic infectious disease, which affects the heart and

digestive tract, as in *Chagas* disease, deserves special attention. These diseases can be associated with other losses already experienced with *Chagas* disease and may impact special situations that are yet unknown. It is in this direction that this study aims to contribute because there are few studies in the literature comparing the QoL of adults and older adults with *Chagas* disease.

The aim of this study was to evaluate perceived quality of life in adult and older adult patients with *Chagas* disease. It intended to compare the scores of the QoL domains categorized by the medians of the variables gender, age, clinical forms of *Chagas* disease, and comorbidities.

METHODS

This descriptive and cross-sectional research used WHOQOL-BREF to assess quality of life. The domains proposed by the World Health Organization Quality of Life⁸ are physical, psychological, social relationships, and environment. The WHOQOL-BREF is a short version of the WHOQOL-100, which was translated into Portuguese and validated for the Brazilian population. It contains 24 questions, including the physical domain; psychological domain; social relationships domain; and environment domain. The WHOQOL-BREF includes two general questions about self-perceived quality of life and general health.

This research, conducted between 2005 and 2008, involved 202 *Chagas* disease patients monitored by the Grupo de Estudo em Doenças de Chagas (GEDOCH, *Chagas* Disease Research Group) at the Clinic Hospital of Department of Internal Medicine, Faculty of Medical Sciences at the *Universidade Estadual de Campinas* (State University of *Campinas*), *Brazil*.

The clinical forms of *Chagas* disease were categorized as recommended by the GEDOCH classification as follows: indeterminate, cardiac, and digestive. The study used the information found in the *Chagas* disease patients' medical records at the time of data collection. The medical records were also used to verify the presence or absence of other diseases associated with *Chagas* disease.

The research projects were approved by the Research Ethics Committee of *Universidade Estadual de Campinas* (State University the Campinas), under protocol numbers 359/2005 and 646/2005. All interviewed patients were informed about the aim of this research, and all of them signed an informed consent form.

The eligibility criteria were: two positive serological reactions for *Chagas* disease; being a GEDOCH outpatient for at least 2 years; and being aged 25 years or more. The exclusion criteria were: questionable serology for *Chagas* disease; evidence of clinical decompensation, or deficit that prevented or impaired the patient's ability to understand and answer the questions during the data collection process.

There are no cut-off scores to assess whether quality of life is good or bad. The domain scores were multiplied by four to transform them to a 0-100 scale⁸. The chi-square test and Fisher's exact test (for expected values lower than five) compared the scores of the QoL domains versus the categorical variables, after the categorization of domain scores assessed by the WHOQOL-BREF, considering the sample's medians.

To verify the factors associated with low QoL, univariate and multivariate logistic regression analyses were conducted with stepwise variable selection. The significance level for the statistical tests was 5.0% or $p < 0.05$.

RESULTS

The descriptive analysis of the categorical variables showed that 109 patients were women (53.96%) and 139 (68.81%) were in the age range of 25 to 59 years. In the classification by clinical forms, 135 (66.83%) had the cardiac form; 23 (11.39%) had the digestive form, and 44 (21.78%) had the indeterminate form. Of the total sample, 36.63% had no comorbidities, 49.50% had one or two, and 13.86% had three or more comorbidities.

The results of WHOQOL-BREF scores and their domains are showed in Table 1. Through the

evaluation of QoL by the WHOQOL-BREF scale, the social relationships domain was the best rated, followed by the psychological and physical domains, and the environment domain was the worst rated by the whole group of patients with *Chagas* disease. The WHOQOL-BREF scores were categorized and compared with the categorical variables of the entire sample (Table 2). In the multivariate logistic regression analysis (Table 3), continuous variables were categorized by the median value of the overall sample in high and low values of QoL. The age ranges did not differ significantly.

Table 1. Distribution of domain scores of the World Health Organization Quality of Life-BREF (n=202; 0-100 scale), *Chagas* Disease Research Group. *Campinas*, SP, Brazil, 2005-2008.

Domains	M	SD	Median
Physical	55.99	16.02	57.14
Psychological	60.83	14.98	62.50
Social Relationships	67.62	15.99	66.67
Environment	52.86	11.78	53.13

Note: M: Mean; SD: Standard Deviation.

The variables that were associated with worse scores in the physical domain were the digestive and cardiac forms (R: 3.77 and R: 4.42 times more likely, respectively, than the indeterminate form); and ≥ 3 comorbidities (R: 3.47 times more likely compared with those without comorbidity). In the psychological domain, the variables were the digestive and cardiac forms (R: 3.33 and R: 2.93 times more likely, respectively, than the indeterminate form). In the social relationships domain, the variables were the digestive and cardiac forms (R: 3.63 and R: 2.17 times more likely, respectively, than the indeterminate form). The variable associated with the worse scores in the environment domain was female gender (R: 1.84 times more likely to perceive worse QoL than men). The patients with ≥ 3 comorbidities were 3.47 times more likely to have worse perception of QoL than those without comorbidity.

DISCUSSION

The objective of this study was to evaluate the perceived QoL of adult and older adult patients

with different clinical forms of *Chagas* disease, classified as indeterminate, cardiac, and digestive⁹. Authors^{10,11} have highlighted that the indeterminate clinical form is more common in adults, suggesting the progressive characteristics of this disease. The indeterminate form is a long-lasting asymptomatic phase. However, two or more decades after infection, 20.00% or 30.00% of patients could progress to the cardiac form, and 10.00% to 15.00% could develop the digestive form¹². *Chagas* disease

progresses to the cardiac, digestive, and mixed clinical forms, which may manifest in older patients¹¹ who are more exposed to the deleterious effects of *Chagas* disease¹³. Therefore, although it is difficult to confirm if the heart disease occurs as a result of *T. cruzi* or if it is associated with other morbid conditions more common in old age¹⁴, this chronic infectious disease tends to progress, including the development of cardiac damage, which is a proven fact¹⁰. On the other hand, the clinical manifestations of *Chagas*

Table 2. Distribution of the categorical variables by domain scores of the World Health Organization Quality of Life-BREF, *Chagas* Disease Research Group. Campinas, SP, Brazil, 2005-2008.

	High Quality of Life		Low Quality of Life	
	n	%	n	%
Physical Domain				
Clinical Forms	64	47.41	71	52.59
Cardiac	10	43.48	13	56.52
Digestive	34	77.27	10	22.73
Indeterminate				
*$\chi^2 = 12.94$; DF = 2; $p=0.002$				
Comorbidities				
None	46	62.16	28	37.84
1-2	53	53.00	47	47.00
≥ 3	09	32.14	19	67.86
*$\chi^2 = 7.37$; DF = 2; $p=0.025$				
Psychological Domain				
Cardiac	57	42.22	78	57.78
Digestive	09	39.13	14	60.87
Indeterminate	30	68.18	14	31.82
*$\chi^2 = 9.70$; DF = 2; $p=0.008$				
Social Relationships Domain				
Cardiac	57	42.22	78	57.78
Digestive	07	30.43	16	69.57
Indeterminate	27	61.36	17	38.64
*$\chi^2 = 7.15$; DF = 2; $p=0.028$				
Environment Domain				
Cardiac	56	41.48	79	58.52
Digestive	10	43.48	13	56.52
Indeterminate	22	50.00	22	50.00
*$\chi^2 = 0.98$; DF = 2; $p=0.613$				
Gender	n	Score	n	Score
Female	40	36.70	69	63.30
Male	48	51.61	45	48.39
*$\chi^2 = 4.54$; DF = 1; $p=0.033$				

Note: *Chi-square test; High Quality of Life: scores above the median; Low Quality of Life: scores equal to or below the median. Values in bold differ significantly.

DF: Degrees of Freedom.

disease reflect the patients' lifestyle, since there already have been reports that discomfort arising from cardiac and digestive changes associated with this disease can reduce productivity and affect the patients' well-being⁶. The cardiac form presents progressive dilated cardiomyopathy with congestive heart failure, and the gastrointestinal complications include chronic constipation and dysphagia, regurgitation, and abdominal pain¹⁵. Health-related quality of life impairment is common in *Chagas* disease patients, especially in patients who develop cardiomyopathy, the most severe form of *Chagas* disease manifestation¹⁶.

Pérez-Molina *et al.*¹⁵ cited studies in which 14.00% to 45.00% of patients presented the cardiac form, and 10.00% to 21.00% presented gastrointestinal complications. Cardiac and gastrointestinal complications rarely happen together in the same patient. This study evaluated *Chagas*

disease adults and older adults, 53.95 females; 68.81% aged 25 to 59 years; 66.83% had the cardiac form, followed by the indeterminate (21.78%) and digestive (11.39%) forms. No patient had the mixed form (cardiac plus digestive). However, as the clinical form, authors¹⁵ found prevalence of indeterminate (47.50%) on cardiac (37.50%) and digestive (7.50%), also observing the occurrence of the mixed form in 3.75% of the cases.

The tertiary level of the service where this study was developed can also be related to the prevalence of patients with more severe clinical changes as they require more complex therapeutic approach. Additionally, the distribution of clinical forms in that service may be related to the referral and cross-referral system used by GEDOCH because patients classified as having the indeterminate form are referred to the Basic Healthcare Units in *Campinas* city and region, resulting in a higher concentration

Table 3. Multivariate logistic regression analysis for the World Health Organization Quality of Life-BREF, *Chagas* Disease Research Group. *Campinas*, SP, Brazil, 2005-2008.

Variables	Categories	p-value	OR ¹	95%CI OR ²
Physical Domain ³				
Clinical Forms	Indeterminate		1.00	
	Cardiac	<0.001	3.77	1.73 - 8.24
	Digestive	0.007	4.42	1.49 - 13.08
Comorbidities	None		1.00	
	1-2	0.228	1.46	0.79 - 2.69
	≥ 3	0.008	3.47	1.38 - 8.72
Psychological Domain ⁴				
Clinical Forms	Indeterminate		1.00	
	Cardiac	0.003	2.93	1.43 - 6.03
	Digestive	0.025	3.33	1.17 - 9.53
Social Relationships Domain ⁵				
Clinical Forms	Indeterminate		1.00	
	Cardiac	0.029	2.17	1.08 - 4.36
	Digestive	0.019	3.63	1.24 - 10.64
Environment Domain ⁶				
Gender	Male			
	Female	0.034	1.84	1.05 - 3.23

Note: ¹Odds Ratio - Stepwise variable selection; ²95% Confidence Interval (CI) OR=95%CI: Confidence Interval for the Odds Ratio; ³Groups - High Quality of Life: n=108; Low Quality of Life: n=94; ⁴Groups - High Quality of Life: n=96; Low Quality of Life: n=106; ⁵Groups - High Quality of Life: n=91; Low Quality of Life: n=111; ⁶Groups - High Quality of Life: n=88; Low Quality of Life: n=114. Values in bold differ significantly.

of patients with the most severe clinical forms of *Chagas* disease at this service⁴.

The distribution by age and gender was similar to that reported by Bozelli *et al.*¹⁷ in *Chagas* disease outpatients from a university hospital (*Maringá*, PR). These authors also found more women aged 20 to 60 years.

In the present study, only 36.63% of the patients had no associated disease; 13.86% had ≥ 3 comorbidities. This fact takes on special relevance when considering that comorbidities tend to increase with advancing age and can be associated with complications, compromising the functional capacity, independence, and autonomy of older adults, which may reflect in worse perception of quality of life in those aging with *Chagas* disease¹⁸.

Recently, a study with *Chagas* disease older adults¹⁴ found up to 3 associated diseases, especially high blood pressure, osteoporosis, osteoarthritis, dyslipidemia, ischemic heart disease, diabetes mellitus, and dyspeptic syndrome unrelated to *Chagas* disease digestive form, as well as heart failure and hypothyroidism. In the same study, patients with the indeterminate form perceived their health as good and very good. However, older adults with the digestive form perceived their health as bad and very bad. The study patients with the digestive form had worse perceived QoL too.

The literature points out high blood pressure as the most common disease associated with *Chagas* disease in adults and older adults^{4,11,14}. The potential morbidity of this association is noteworthy, particularly to the cardiovascular system. Clearly, damage resulting from this type of involvement can lead to functional and cognitive impairment, which certainly could influence QoL assessment.

Oliveira *et al.*¹⁹ also found that the presence of cardiovascular and gastrointestinal symptoms, use of medication, and presence of associated diseases were related to worse QoL in patients with *Chagas* disease than in those without this disease.

In this study being female and higher number of comorbidities were associated with worse

perceived QoL in the physical domain, which is, among others, related to items such as wealth, health, and social care. Socioeconomic factors and access to health care services affect the treatment of older adults, especially those with chronic diseases. Comorbidities, by themselves, could have a negative impact on health and QoL.

Guariento *et al.*⁴ analyzed medical records of approximately 2,500 patients with *Chagas* disease and found that 63.80% had some kind of associated disease. The most common was hypertension (20.60%), followed by other chronic infectious diseases (2.00%). The prevalence in women was 22.80% versus 18.70% in men. Considering that self-rated health is one of evaluation components of quality of life, it can be inferred that for *Chagas* disease patients, the most severe clinical presentations of the disease and the association with other chronic diseases can contribute to worse perceived QoL.

Considering the responses of the sample as a whole, the environment domain had the lowest score, followed by physical and psychological domains, and the social relationships domain had the highest scores. Gontijo *et al.*⁷ also administered the WHOQOL-BREF to 70 patients aged 27 to 79 years, monitored at a university hospital in *Minas Gerais* State, and obtained the same findings: the highest scores were for the social relationships domain (71.72), followed by the psychological (62.26), physical (60.53), and environment domains (53.82).

Environment domain includes assessment of physical security and protection; home environment; wealth; health and social care: accessibility and quality; opportunities to acquire new information and skills; participation in recreational opportunities, leisure; physical environment and transportation. In this domain, being female was associated with lower scores in the WHOQOL-BREF scale (63.30% of women versus 48.39% of men). Previously, Orosz *et al.*²⁰ studied *Chagas* disease patients treated at a university hospital and found worse clinical presentation in women. The authors attribute this findings to the way females from other of the

hospital's outpatient clinics are referred, which is quite different from most men, who were referred by blood therapy services when they tried to donate blood, or by occupational physicians during a pre-admission review, thus in better clinical condition.

Lima-Costa *et al.*²¹ studied the clinical and socioeconomic conditions of individuals with and without *Chagas* disease from *Bambuí*, city of *Minas Gerais* state, which was previously considered endemic for *T. cruzi* infection. They found that those who had positive serology for *Chagas* disease compared with those who had negative serology presented lower education level, lower income, and greater reference to positive histories of other chronic morbid conditions, higher systolic and diastolic blood pressures, and lower body mass index.

These findings confirm that *Chagas* disease patients do not only have an increased risk of physical deterioration but are also more susceptible to more precarious conditions due to lower socioeconomic status and access to information, which, in this study, is expressed as worse perceived quality of life in the environment domain.

Therefore, even the literature considers being male a bad prognostic factor for *Chagas* disease, despite cardiac involvement and other gender-related factors, such as availability of care in healthcare services, which can influence the clinical presentation of *Chagas* disease and its development in women. These factors are taken into account by the environment domain of the WHOQOL-BREF scale, which has a specific question on access to health services.

Thus, it can be assumed that in this sample of *Chagas* disease patients, the worst perceived QoL in the environment domain reflects the difficulties related to being female in this domain, among which the following stand out: wealth, access to health and social care, and opportunity to acquire new information.

In the physical domain evaluation, the association of score (high or low) with the clinical form of *Chagas* disease and number of comorbidities showed that patients with the indeterminate form

had better perceived QoL than those with the cardiac and digestive forms. In addition also in this domain, patients with ≥ 3 comorbidities had worse perceived QoL than those without a history of comorbidities. Patients who experience worse clinical condition (severe clinical forms of *Chagas* disease and more associated diseases) also had worse perceived quality of life in the physical domain.

Considering that the physical domain in the WHOQOL-BREF scale includes assessment of pain and discomfort; energy and fatigue; sleep and rest; activities of daily living; dependence on medication or treatments; and ability to work, it is possible that the lowest scores in this domain are related to the poor clinical condition of the study sample, which had a high proportion of cardiac patients (66.83%) and patients with more than one chronic disease (63.37%). These patients may also require more regular use of drugs and visits to health services and/or hospital admissions. Alves *et al.*¹⁴ study found daily use of up to four drugs in 74.40% of older adults with *Chagas* disease. The use of up to 10 daily medications has been reported; only one patient (1.10%) did not use medication, and 17.80% of the older adults had been hospitalized at least once in the previous year.

The social relationships domain obtained the best scores in this study. The better scores may stem from perceived social support, which helps patients to better deal with difficulties. However, those patients with the cardiac and digestive forms had worse perceived QoL than those with the indeterminate form.

In the psychological domain, when assessing the association between WHOQOL-BREF scores and clinical form of *Chagas* disease, similarly to what happened in the physical domain, low scores were related to having the cardiac and digestive forms. However, associated diseases were not associated with low scores in this domain.

Uchôa *et al.*²² investigated the universe of representations and behaviors associated with workers with *Chagas* disease, and found that when asked about the most important consequences of

the disease in their lives, they referred particularly to psychological and labor aspects. In 2005 Hueb & Loureiro²³ made a critical analysis of the literature about the association between *Chagas* disease and the cognitive and psychosocial functioning of patients, and detected psychosocial losses related to this disease.

When evaluating patients with symptomatic and asymptomatic *Chagas* disease, Mota *et al.*²⁴ found that the presence of symptoms was a risk factor for the development of hopelessness and emotional difficulties, and related to decreased tenacity and innovation.

It appears that the results of this study are aligned with the literature. More recently, a study¹⁸ found evidence of depressive symptoms in patients with the cardiac and digestive forms of *Chagas* disease, significantly more than in patients with the indeterminate form of this disease. Comparing domain scores in the clinical forms, patients with the digestive form presented disadvantages.

In the psychological domain, the following items were evaluated: positive feelings; thinking, learning, memory and concentration; self-esteem; body image and appearance; negative feelings; spirituality, religion, and personal beliefs. In this evaluation, this domain had a better score than the environment and physical domains.

In this study the perceived QoL in the psychological domain was better than those in the physical and environment domains, despite any possible undetected psychological changes that could be present in the study sample. However, patients with the cardiac and digestive forms had lower QoL in this domain than those with the indeterminate form. A research¹⁸ with 110 *Chagas* disease adults and older adults assessed by the Beck Depression Inventory found patients with the cardiac (50.00%) and digestive (64.29%) forms had a significantly higher level of depressive symptoms than patients with the indeterminate form (13.79%). However, even in the face of possible psychiatric disorders that may have been present in the study sample, which were not subjected to evaluation, the perceived quality of life in this domain was better than those of the physical and environment domains.

In another publication²⁴ related to *Chagas* disease patients, the existence of symptoms was considered a risk factor for the development of hopelessness and emotional difficulties. Therefore, there is an agreement between the results of the present study and the findings reported in this other study.

Finally, the social relationships domain received the highest scores, but the scores attributed by patients with the indeterminate form were significantly higher than those attributed by patients with the cardiac and digestive forms. The proportion of patients with worse QoL scores was always higher in the digestive form than in the cardiac form (56.52% versus 52.59% in the physical domain; 60.87% versus 57.87% in the psychological domain; 69.57% versus 57.78% in the social relationships domain). In addition, the proportion of patients with the digestive form who positively rated their social relationships domain was quite low, being the lowest of all domains (43.48% in the physical domain; 39.13% in the psychological domain; and 30.42% in the social relationships domain). This negative evaluation may be associated with patient dissatisfaction with their personal relationships with family members and loved ones, given that sharing meals constitutes one of the strategies to strengthen this type of bond, and the bearer of the digestive form of *Chagas* disease often has difficulty to eat. In addition to this possibility, we need to consider, as cited elsewhere¹⁸, that the digestive form of *Chagas* disease progresses to the development of symptoms and clinical signs that limit food intake, such as difficulty swallowing, heartburn, regurgitation, progressive constipation, and bloating, among others, which may contribute to the onset of depressive symptoms. These manifestations, in addition to depressive symptoms, may contribute to social isolation and the deterioration of social relationships.

In the present research the "domain of social relationships" of WHOQOL-BREF was best rated and the environment domain presented the worst rating. The factors associated with worst scores in the physical, psychological, and social relationships domains were having the cardiac and digestive forms

of *Chagas* disease. In the physical domain, the worst perceived QoL also was associated with higher number of comorbidities. However, in the environment domain, besides the greater number of comorbidities, being female was also related to lower QoL scores. None of the study variables significantly influenced the WHOQOL-BREF scale individual domain scores of adults and older adults with *Chagas* disease.

Similar to other studies, such as the one conducted by Lima-Costa *et al.*¹³, who assessed *Chagas* disease patients from a previously endemic area, and by Alves *et al.*¹⁴, who assessed *Chagas* disease older adults being followed at a reference service, the study participants also belong to social strata with higher disability and other resources in this level. Indeed, the domain of social relationships refers to personal relationships, support or social support, and sexual activity. One may assume that these patients feel better addressed by the support given to them by family members and the health services that treat them.

The variables of the group aged 25 to 59 years and of the group aged ≥ 60 years did not differ significantly by WHOQOL-BREF domain. Thus, it seems that age had no impact on the study sample's perceived QoL. A previous study²⁵ found that *Chagas* disease patients without advanced cardiac disease had good performance, comparable to younger people in the same clinical stage. Almeida *et al.*¹¹ also found no significant clinical differences between adult and older adults with *Chagas* disease. However, *Chagas* disease can worsen over time, going from the most benign to the most severe forms, especially in relation to heart disease^{26,27}.

A previous study²⁸ suggested that *Chagas* disease only progressed unfavorably before age 60 years, and the survival of those who lived past the sixth decade of life was not significantly affected by the disease. More recently, Rocha *et al.*²⁵ found that older adults with *Chagas* disease but without advanced disease had good performance, comparable to young people in the same clinical stage.

The clinical form of *Chagas* disease in the study sample had greater impact on perceived QoL than age. When studying a group of older adults living in an old endemic area of *T. cruzi* infection in the southwest of Brazil, Lima-Costa *et al.*¹³ noticed the additional burden that this chronic infection imposed on infected patients as they aged, often in unfavorable socioeconomic conditions. More recently, Bertanha *et al.*²⁹ described that *Chagas* disease patients with associated hypertension were older than non-hypertensive patients, and Alves *et al.*¹⁴ found a high percentage (42.10%) of older adults with four or more associated diseases, and hypertension (56.70%) was the most common. Furthermore, *Chagas* disease may progress from the more benign form to the more severe form, especially the cardiac form²⁶.

The clinical form of *Chagas* disease may have a greater impact on perceived quality of life than aging. However, increasing age is knowingly accompanied by an increase in the number of chronic diseases. A few years ago, Chaimowicz³⁰ issued a warning to administrators and healthcare professionals in Brazil, associating lower mortality in younger patients with higher morbidity in older patients, particularly at the expense of non-infectious chronic diseases. Therefore, although this research has not found significant differences in the perceived QoL of adults and older adults with *Chagas* disease, it is important to consider that the age factor can exert an indirect effect due to *Chagas* disease progression and associated chronic diseases, more common in old age.

Finally, it is worth noting that although higher rates of morbidity and mortality have been associated with the cardiac form of *Chagas* disease^{10,31}, with an adverse impact on QoL^{21,32}, there is evidence that the digestive form also has negative impact on QoL, as observed by Ozaki *et al.*¹⁸ and by the present study.

CONCLUSION

The WHOQOL-BREF domain scores of patients by age group (adults versus older adults) and by the

subgroups clinical form, gender, and number of comorbidities did not differ significantly.

It should be noted that, among the variables considered in this study, intervention is possible in clinical characteristics (cardiac and digestive involvement by *Chagas* disease, as well as higher number of comorbidities), as long as this chronic infectious disease and other associated diseases are detected in its early stages, by focusing on preventing complications and improving the associated disorders.

Although this is a cross-sectional study with a very specific sample of *Chagas* disease patients, it aimed to point out the major challenge to be overcome in order to improve the quality of life of these patients.

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CONTRIBUTORS

OZAKI Y participated in the study conception and design, collection and analysis and interpretation of data and manuscript writing. DIAS ELF participated in the collection and data tabulation. ALMEIDA EA revised the manuscript. GUARIENTO ME contributed to the study conception and design and analysis and interpretation of data and approved the final version.

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