

# Translation and validation of the Drug Hypersensitivity Quality of Life Questionnaire (DrHy-Q) to Brazilian Portuguese

*Tradução e validação do Questionário de Qualidade de Vida em Hipersensibilidade a Drogas (DrHy-Q) para a língua portuguesa (cultura brasileira, DrHy-Qb)*

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## ABSTRACT

**Introduction:** Drug hypersensitivity is a clinical condition that can impair health-related quality of life. Originally developed in Italian, the Drug Hypersensitivity Quality of Life Questionnaire (DrHy-Q) measures the impact of drug hypersensitivity on quality of life. The objective of this study was to translate, cross-culturally adapt, and validate the DrHy-Q to Brazilian Portuguese (DrHy-Qb). To be successful, the DrHy-Qb must be internally consistent, maintain construct validity, and be reproducible as an assessment tool for quality of life in Brazilian patients with drug hypersensitivity. **Methods:** Translation and back-translation were performed by 3 bilingual translators, followed by a pre-test and a final version. The final version, the DrHy-Qb, and the 36-Item Medical Outcomes Study Short-Form General Health Survey (SF-36) were administered to 84 patients (69% female, 40.3±15.2 years) from a specialized outpatient clinic. Factorial analysis included Pearson's correlation coefficient to validate the construct, Cronbach's alpha to assess the internal consistency, and intraclass correlation coefficient to determine reproducibility. **Results:** Statistical analysis showed excellent internal consistency ( $\alpha = 0.936$ ) and reproducibility ( $r: 0.984$ ; 95% CI: 0.963-0.993;  $p < 0.001$ ). The correlation between the DrHy-Qb and the SF-36 was moderate and negative ( $r: -0.394$ ;  $p < 0.01$ ). **Conclusions:** This study showed that the DrHy-Qb was successfully translated, adapted, and validated into Brazilian Portuguese, and can be used to assess quality of life in patients with drug hypersensitivity.

**Keywords:** Drug hypersensitivity, surveys and questionnaires, quality of life, language, validation study.

## RESUMO

**Introdução:** A hipersensibilidade a fármacos é uma condição clínica debilitante, acompanhada de experiência emocional intensa e pode afetar a qualidade de vida relacionada à saúde (QVRS). A repercussão das reações de hipersensibilidade a drogas (RHD) na qualidade de vida (QV) pode ser verificada pela utilização de questionário específico, o *Drug Hypersensitivity Quality of Life Questionnaire* (DrHy-Q), desenvolvido originalmente na língua italiana. O objetivo foi traduzir, adaptar transculturalmente e validar a versão do DrHy-Q para a língua portuguesa (cultura brasileira, DrHy-Qb), verificando a consistência interna, validação de constructo e reprodutibilidade do DrHy-Qb, como instrumento específico de avaliação da QV nos pacientes brasileiros com hipersensibilidade a fármacos. **Métodos:** A adaptação do questionário consistiu na tradução e retrotradução realizadas de forma independente por três tradutores bilíngues, seguidas por pré-teste. A versão final, DrHy-Qb juntamente com o questionário de qualidade de vida resumido (SF-36), foi respondido por 84 pacientes (69% feminino, 40,3±15,2 anos) acompanhados em ambulatório especializado. Na análise fatorial, a validação de constructo foi realizada pelo cálculo do coeficiente de correlação de Pearson, de consistência interna pelo coeficiente alfa de Cronbach, e da reprodutibilidade pelo coeficiente de correlação intraclass. **Resultados:** A análise estatística evidenciou consistência interna ( $\alpha = 0,936$ ) e reprodutibilidade ( $r: 0,984$ ; IC95% = 0,963-0,993;  $p < 0,001$ ) excelentes. A correlação entre o DrHy-Qb e o SF-36 total foi negativa e moderada ( $r = -0,394$ ;  $p < 0,01$ ). **Conclusões:** O DrHy-Qb foi adequadamente traduzido, adaptado e validado para a cultura brasileira, podendo ser útil na avaliação da qualidade de vida dos pacientes com hipersensibilidade a fármacos.

**Descritores:** Hipersensibilidade a drogas, inquéritos e questionários, qualidade de vida, idioma, estudo de validação.

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## Introduction

Drug hypersensitivity reactions (DHRs) represent up to 15% of all adverse reactions to drugs.<sup>1</sup> Depending on the mechanism, these reactions can trigger a variety of clinical manifestations such as urticaria, angioedema, bronchospasm, anaphylaxis, exanthems, and other signs and symptoms. The skin is affected in more than 90% of the cases.<sup>2</sup>

The relationship between clinical manifestations and suspected drugs is frequently hard to be determined, hindering adequate patient follow-up. The absence of an accurate etiological diagnosis interferes with the choice of specific treatments, which may not be as effective when compared to first-line options.<sup>3</sup>

In any case, DHRs significantly influence clinical practice and are a frequent cause of increased hospitalization times, changes to medical prescriptions, and a consequent socioeconomic impact.<sup>2</sup>

In clinical practice, from the patients' point of view, a history of DHRs is an experience that comes along with an intense emotional load, such as fear, anxiety, somatization, and insecurity when faced with the need to use any drugs that may negatively affect their life and compromise their everyday functioning.<sup>4</sup> The assessment of health-related quality of life (HRQoL) is important for measuring the impact of diseases on patients' daily lives.<sup>5</sup>

The repercussion of DHRs in quality of life (QoL) can be verified by using a specific questionnaire, the Drug Hypersensitivity Quality of Life Questionnaire (DrHy-Q), which was originally developed in the Italian language. This is a single-domain instrument comprising 15 items that met standards of construct validity, internal consistency, and reliability; it is thus appropriate for use alone or in combination with other questionnaires with the aim of reporting the emotional experiences of patients with drug hypersensitivity.<sup>6</sup>

DrHy-Q was also translated and validated to the Turkish, Dutch, Spanish, Thai, and Portuguese (Portugal) languages.<sup>7-11</sup>

The Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36) has a Brazilian version; this is a generic health assessment instrument comprising 36 questions of easy implementation and understanding that can be applied to the general population.<sup>12</sup>

There are no Brazilian studies assessing the QoL of patients with drug hypersensitivity, nor a validated version of the DrHy-Q in Portuguese (Brazilian culture).

The development of a specific tool would be time-consuming and onerous and would hamper the comparison of the obtained results with those observed in other countries. Hence the importance of the cross-cultural adaptation of the DrHy-Q, a valid and reliable instrument.

This study aimed to translate, adapt, and validate the original version of the DrHy-Q for the Portuguese language (Brazilian culture, DrHy-Qb) and verify its validity, reliability, and reproducibility.

## Methods

This is a cross-sectional study of a population followed-up between November 2017 and December 2019 in a specialized outpatient clinic. During this period, the clinic received 174 patients over 18 years old with a suspected history of DHRs.

For adapting and validating the DrHy-Qb, we used a convenience sample of 94 patients with a probable history of DHRs.<sup>13</sup> According to the causality scale, we considered a probable reaction when a clinical event had a temporal relationship with drug administration, presenting or not an abnormal laboratory test, and which was unlikely to be attributed to other diseases or chemicals and showed clinical response on drug withdrawal.<sup>13</sup>

The study included patients over 18 years old of any sex, with a probable history of DHRs, who accepted to participate and signed an informed consent form (ICF). Exclusion criteria considered patients with unlikely or possible history of DHRs, patients with other chronic diseases such as psychosomatic diseases and routine use of analgesic drugs capable of interfering with QoL, and those who refused participation.

## Translation of the DrHy-Q

Linguistic adaptation was based on a method suggested by the author of the original questionnaire, so as to obtain a translated version that is conceptually equivalent to the original questionnaire.

Translation from the original Italian version to Portuguese (Brazilian culture) was overseen by a team (two bilingual Italian translators and two allergist and immunologist physicians, who held technical knowledge in the area), in an independent manner and being informed of the research objectives.

We emphasized the need for the translation to be conceptual and not only literary, as well as for the

language to be colloquial and easily understandable. The translation encompassed the same concepts and items as the original instrument, with culturally relevant and accepted expressions.

### **Back translation of the DrHy-Q**

The consensus version was back translated into Italian by another native Italian, bilingual Portuguese translator and was compared to the original version by a native Italian evaluator in order to revise the reference meaning of each item, in addition to detecting differences or discrepancies between both editions.

This back-translated version was also evaluated by the study team and by the author of the original questionnaire, thus proceeding to the cross-cultural adaptation phase.

### **Adaptation of the DrHy-Q**

The consensus version was applied to a sample of 10 patients with the aim of evaluating whether the translation was easily understood, with simple and suitable language.

The patients were randomly selected in routine consultations. They were inquired as to difficulties in understanding the questions and answer options and when pertinent, their opinion was requested on which was the best way to make these questions.

The final version of the adapted DrHy-Q (DrHy-Qb) (Annex 1) comprised 15 items, with a total score that varied from 15 points (better QoL) to 75 points (worse QoL), employing a 5-point Likert scale.

### **Validation of the adapted DrHy-Qb**

A convenience sample comprising 84 patients with probable history of DHRs answered the DrHy-Qb, along with the Brazilian version of a generic health instrument (SF-36).<sup>12</sup>

Psychometric measures taken during this validation process include construct validity, reliability, and reproducibility of the evaluated instrument.

### **Statistical analysis**

The collected data were stored in a Microsoft Excel file and statistical analysis was performed with SPSS 25.0 software, at a significance level of 5% ( $p < 0.05$ ).

Quantitative and qualitative variables were assessed in a descriptive manner. In addition, analyses of normality of the sample and homogeneity of variances were performed as a prerequisite for possible analyses of parametric and non-parametric correlations.

For construct evaluation of the questionnaire, we chose to calculate Pearson's correlation coefficient ( $r$ ), which can vary from -1 to +1; values closer to 1 represent stronger correlations. Negative values correspond to inverse correlations.<sup>14</sup>

Cronbach's alpha reliability coefficient was used for assessing internal consistency. Results closer to 1 represent the most consistent variables.<sup>15</sup> Values over 0.75 are considered acceptable.<sup>16,17</sup>

For assessing the reproducibility of DrHy-Qb, we used the intraclass correlation coefficient (ICC), looking for consistency between when the questionnaire was first answered and when it was reapplied, after a period of 7 to 30 days. In order to achieve statistical validity, at least 20% of the sample is expected to be reevaluated. Results close to 1 indicate a strong correlation, that is, with less variability between the compared measures.<sup>18,19</sup>

### **Ethical aspects**

This research proposal was analyzed and approved by the Research Ethics Committee at UNIFESP and is registered at Plataforma Brasil (CAAE: 42295414.7.00005505). The integrity, privacy, and secrecy of patient information were rigorously respected. All research procedures were in agreement with resolution No. 466/12 and resolution No. 510/16 of the National Health Council on research with human beings. All participants signed the ICF.

## **Results**

### **Assessing conceptual, item, and semantic equivalence of the DrHy-Qb**

Out of ten selected patients, seven demonstrated they understood all items of the DrHy-Qb at the cultural adaptation phase. Three patients suggested semantic changes to questions, considering more appropriate terms and words for a better understanding and approximation to the Brazilian reality.

During the validation phase, some interviewees had difficulty distinguishing the inquired feelings:

anxiety, anguish, fright, worry, and fear. The mean application time was 7.5 minutes for patients who understood and filled out the questionnaire, whereas the mean time for those who required help by an interviewer for reading the questions was 24 minutes. All patients answered the DrHy-Qb questions.

### **Socioeconomic and clinical characteristics of the sample**

Women comprised 69% (n = 58) of the sample, and the mean age of the population was 40.3 years (median [SD], minimum-maximum; 36 years [15.19], 18-72 years). We decided to read the questions for 21.4% of the patients (n = 18) who were not able to read or write and had basic knowledge on the disease. The other socioeconomic characteristics are described in Table 1.

The most frequent clinical manifestation was isolated palpebral angioedema, which occurred in 40.5% of the cases (n = 34), followed by anaphylaxis in 35.7% (n = 30). Hypersensitivity reactions were related with the number of drugs, number of episodes, and class of the implicated drugs (Table 2).

### **Reliability assessment of the DrHy-Qb**

By calculating Cronbach's alpha coefficient, we demonstrated that the internal consistency between the 15 items of the DrHy-Qb was excellent ( $\alpha = 0.936$ ).

Similarly, the DrHy-Qb was shown to be precise when confirming item reliability, that is, all questions contributed for a good accuracy when comprising the questionnaire (Table 3).

### **Assessing reproducibility via the intraclass correlation coefficient (ICC)**

Twenty-three patients (27.3%) were randomly selected and answered the DrHy-Qb again after a period that varied from 7 to 30 days after first assessment. In this study, the agreement of questionnaire reproducibility was classified as excellent.

The ICC showed a correlation of  $r = 0.984$  (95%CI = 0.963-0.993,  $p < 0.001$ ), confirming an excellent agreement for DrHy-Qb reproducibility.

**Table 1**

Demographic and socioeconomic characteristics of the studied population

Characteristics	N (%)
Patients	84 (100)
Sex	
Female	58 (69)
Male	26 (31)
Age group	
18-29 years old	26 (31)
30-59 years old	44 (52.4)
60 years old or older	14 (16.7)
Education	
Illiterate	18 (21.4)
Lower secondary education	10 (11.9)
Upper secondary education	21 (25)
Undergraduate/graduate education	35 (41.7)
Instrument application	
Self-administered	66 (78.6)
Required help reading	18 (21.4)

### **Construct evaluation of DrHy-Qb**

The mean DrHy-Qb score was 43.19 points (median [SD], minimum-maximum; 44 [13.95], 15-70) and the mean SF-36 total score was 108.44 points (median [SD], minimum-maximum; 111.55 [18.48], 60.5-139) (Table 4). It is important to note that higher DrHy-Qb scores, as well as lower SF-36 scores, represent worse QoL.

Pearson's correlation coefficient showed a moderate negative correlation (the instruments are inversely proportional) between mean DrHy-Qb scores and mean SF-36 total scores ( $r = -0.394$ ;  $p < 0.01$ ). Considering the domains, no significance was observed in "physical role limitations" ( $p = 0.11$ ) and "vitality" ( $p = 0.07$ ). The other domains, on the other hand, showed a significant moderate and negative correlation with mean DrHy-Qb scores (Table 5).

**Table 2**  
Clinical characteristics of the studied population

Characteristics	N (%)
Number of episodes	
1 episode	31 (36.9)
2 or more episodes	53 (63.1)
Number of drugs	
1 drug	30 (35.7)
2 or more drugs	54 (64.3)
Type of drugs	
NSAIDs	58 (69.0)
Beta-lactams	5 (6.0)
Local anesthetics	5 (6.0)
Perioperative anaphylaxis <sup>a</sup>	13 (15.5)
Other <sup>b</sup>	3 (3.6)
Type of reaction	
Anaphylaxis	30 (35.7)
Angioedema of the lips	19 (22.6)
Angioedema of the larynx	10 (11.9)
Angioedema of the tongue	1 (1.2)
Palpebral angioedema	34 (40.5)
Severe delayed adverse cutaneous reactions	0 (0.0)
Respiratory symptoms	1 (1.2)
Maculopapular exanthem	8 (9.5)
Urticaria	20 (23.8)

NSAIDs = non-steroidal anti-inflammatory drugs.

<sup>a</sup> Drugs involved in perioperative anaphylaxis: benzodiazepines, neuromuscular blocking agents, hypnotics, opioids, cholinesterase inhibitors, antiemetics, and antiseptics.

<sup>b</sup> Others: proton pump inhibitors and radiocontrast agents.

## Discussion

### Translation and cross-cultural adaptation

In the translation phase, the back-translated version was compared to the original source version in order to detect misunderstandings, translation errors, or imprecisions of the new questionnaire. When developing an instrument by consensus building, translation performed by a committee approach

reduces the cultural and social bias that can happen when only one or two translators are responsible for the translation.

Even though all versions of the DrHy-Q were translated from the original Italian questionnaire, each adaptation into different cultures could have altered the questionnaire content and consequently its objective assessment. This is minimized when consulting the author of the original questionnaire. After validating the Brazilian version, we named it DrHy-Qb for better differentiating it from other available cultural versions.

Some interviewees had difficulty distinguishing feelings inquired about in the DrHy-Qb: anxiety, anguish, fright, worry, and fear. Even though all these terms are related to negative feelings, they are not considered synonyms.<sup>20,21</sup>

According to the Brazilian Institute of Geography and Statistics, 11.3 million people over 15 years old could not read nor write in 2018.<sup>22</sup> It is thus expected that some patients would face limitations in understanding the questionnaire. This way, we considered helping 18 patients read the instrument for a better understanding of the process; a mean duration of 24 minutes was required for answering the questionnaire. The other patients, with education levels ranging from lower secondary education to graduate education, had no difficulties answering the questionnaire.

The Thai version reported a mean time of approximately 7.4 minutes, which was similar to that observed in our study.<sup>10</sup> The other DrHy-Q validation studies did not specify the duration of questionnaire application.<sup>6-11</sup>

Regarding data collection, the Thai study reported low rates of unanswered items: around 1.2% of the sample.<sup>10</sup> The Dutch study showed non-responses in 42% of the cases; this was expected since data collection was performed via e-mail.<sup>8</sup> In our study, all patients fully answered the Brazilian version (DrHy-Qb).

### Assessment of the questionnaire's psychometric properties

The psychometric assessment data obtained in our study showed that DrHy-Qb is in line with the results of other validation studies of this instrument.<sup>6-11</sup>

For construct evaluation, we used Pearson's correlation coefficient (r) because this analysis has

**Table 3**

Cronbach's alpha reliability coefficient for each item of the DrHy-Qb

Item	Cronbach's alpha if the item was excluded
1. Since I am unable to take drugs every illness limits me more than other people.	0.933
2. I am afraid of being administered a drug during an emergency to which I am allergic.	0.932
3. I feel frightened due to my problem of allergy reaction.	0.928
4. The problem of adverse reaction to drugs affects my life.	0.930
5. I would like the allergist's opinion before taking drugs prescribed by other specialists.	0.935
6. Even a little discomfort for me is a problem.	0.931
7. The fact that I cannot use medication safely made me feel different from others.	0.935
8. I feel anxious due to my problem of allergy reaction.	0.928
9. For each disease I would be confident that there is a drug that I can safely take.	0.933
10. I am afraid I could not deal with the pain.	0.931
11. I feel anguished due to my problem of allergy reaction.	0.928
12. I worry every time I take a drug different from ones that cause my allergic reactions.	0.930
13. I give up leisure activities (sport, vacations, trips) because of my problem.	0.936
14. I'm in a bad mood due to my problem of allergy reaction.	0.933
15. The idea of taking a medicine makes me feel anxious.	0.933

DrHy-Qb – Drug Hypersensitivity Quality of Life Questionnaire (Brazilian version).

two dependent quantitative variables (DrHy-Qb and SF-36). We observed a negative correlation, that is, an inverse proportionality, which is in agreement with the interpretation that higher DrHy-Qb scores represent worse patient QoL, and the higher the absolute values of SF-36 total scores and scores by domain, the better the patient's QoL.

No patient reported regular use of drugs for treating any physical disease. In this study, data showed a lack of correlation between possible physical role limitations and vitality and a compromised patient QoL.

Construct evaluation via Pearson's correlation coefficient between DrHy-Qb scores and mean SF-36 total scores was shown to be moderate and negative ( $r = -0.394$ ;  $p < 0.01$ ), and showed that specific aspects

**Table 4**

Quality of life scores according to each applied questionnaire

Questionnaire (n=84)	Score		
	Mean	Median	(min - max, SD)
DrHy-Qb	43.19	44.00	(15 - 70; 13.95)
SF-36	108.44	111.55	(60.5 - 139; 18.48)

DrHy-Qb: DrHy-Qb – Drug Hypersensitivity Quality of Life Questionnaire (Brazilian version); SF-36: The Medical Outcomes Short-Form Health Survey (Brazilian version).

**Table 5**

Pearson's correlation coefficient between DrHy-Qb and SF-36 (total score and by domain)

	DrHy-Qb	
	Pearson's correlation (r)	p
SF-36 total score	-0.394	< 0.01
SF-36 domains		
Physical functioning	-0.314	< 0.01 <sup>a</sup>
Physical role limitations	-0.180	0.10
Pain	-0.295	< 0.01 <sup>a</sup>
General health	-0.238	0.03 <sup>a</sup>
Vitality	-0.207	0.05
Social functioning	-0.393	< 0.01 <sup>a</sup>
Emotional role limitations	-0.218	0.04 <sup>a</sup>
Mental health	-0.400	< 0.01 <sup>a</sup>

DrHy-Qb – Drug Hypersensitivity Quality of Life Questionnaire (Brazilian version); SF-36: Medical Outcomes Short-Form Health Survey (Brazilian version).

<sup>a</sup> Significant correlations ( $p < 0.05$ ).

of the HRQoL of patients with DHR episodes were not adequately detected by the generic instrument (SF-36). This result corroborates data found by other DrHy-Q validation studies.<sup>6-11</sup>

The reliability assessment of DrHy-Qb by Cronbach's alpha coefficient showed how consistent this instrument is. If the answers were to be discrepant, the instrument could be unreliable for measuring what it intends to. Some questions are capable of increasing questionnaire consistency, while others are able to decrease it. Our results indicated a global  $\alpha$  of 0.936, showing excellent consistency between the 15 questionnaire items.

By comparing the global alpha to the alpha obtained when excluding each question, we were able to determine whether removing an item would increase overall questionnaire reliability in case the resulting alpha was higher than the global coefficient. In our study, all questions presented a similar and important behavior when comprising the DrHy-Qb,

with an  $\alpha$  per item above 0.928 and a global  $\alpha$  of 0.936. DrHy-Q also presented high reliability in other studies.<sup>6-11</sup>

Statistical analyses showed that DrHy-Qb met reproducibility standards for validating HRQoL instruments, which was similar to previous studies.<sup>6-11</sup> In order to avoid sample losses, some patients answered the questionnaire again after a period of 7 to 30 days.

All of them were inquired on the occurrence of any significant life and health changes in the previous week, similarly to what was performed in the Thai study,<sup>10</sup> and time did not determine the impact on patients' HRQoL.

Our test-retest assessment, applied in 27.3% of the sample, had an excellent result that was confirmed by calculating the ICC ( $r = 0.984$ ; 95%CI = 0.963-0.993,  $p = 0.0001$ ). The other DrHy-Q validations also reapplied the questionnaire in around the same sample percentage and obtained similar results.<sup>6-11</sup>

### Scores obtained in the DrHy-Qb

Comparing DrHy-Qb scores with those obtained in studies of other countries helped us investigate cultural differences and impacts on HRQoL. However, the Dutch validation study converted the scale for the DrHy-Q score to a 0-100 format, where the maximum score indicated a compromised QoL.<sup>8</sup>

Using the tool as it was described and developed is important for a better comparison of case series and their respective results. For this reason, the total DrHy-Q score was converted into a 0-100 scale, where 100 points indicate a more severely compromised HRQoL, and to the original 15-75 scale, where 75 points indicate a worse QoL.<sup>6</sup> Therefore, we were able to analyze median DrHy-Q scores in different populations where this tool was validated (Table 6).

We used the following formula for converting the DrHy-Q score into a 0-100-point scale:

$$\text{DrHy-Q} = \frac{(\sum \text{items} - 15) * 100}{[75 - 15]}$$

The median DrHy-Qb score was 48 points. For reformulating the DrHy-Q score in a 15-75-point scale, we used the formula:

$$\text{DrHy-Q} = [\sum \text{items} * \left( \frac{75 - 15}{100 - 0} \right)] + 15.$$

The median DrHy-Qb score was 44 points (Table 6).

The median DrHy-Q score was not described in the Thai study, only the means for the studied variables.<sup>10</sup> In the Dutch study, on the other hand, lower values were justified by the fact that this was a retrospective study where diagnoses and counseling were performed before questionnaire application, as opposed to what happened with the Italian and Turkish versions. Moreover, the Dutch people displayed more healthy perceptions when compared to the other studied countries, such as a lower use of medicines. These cultural and social differences may influence DrHy-Q results.<sup>8</sup>

**Table 6**

Comparison of median DrHy-Q scores in different countries

Reference	Country	Median DrHy-Q score (scale)	
		(15-75)	(0-100)
Baiardini and colleagues, 2011 <sup>6</sup>	Italy	37	36
Bavbek and colleagues, 2016 <sup>7</sup>	Turkey	35	33
Gastaminza and colleagues, 2016 <sup>9</sup>	Spain	29	23
Moayeri and colleagues, 2017 <sup>8</sup>	The Netherlands	22	12
DrHy-Qb (this study)	Brazil	44	48
Dias de Castro and colleagues, 2021 <sup>11</sup>	Portugal	37	36



The median DrHy-Qb score, when compared to results obtained in other countries, was considered high, probably due to easy access to medicines (many of them can be purchased without medical prescription) and consequent self-medication, increasing the frequency of exposure to drugs. Another associated factor could also be the increase in indiscriminate use of medicines in Brazil.<sup>23</sup>

As opposed to other retrospective studies where the patient is approached years after the reactions or medical counseling, one of the advantages of our study was the fact that patients were assessed while the diagnostic hypothesis was raised and before performing skin or provocation tests. This way, the risk of influencing the questionnaire results is reduced.

All patients adequately answered all items of the DrHy-Qb instrument and no losses were observed in our sample. Another aspect that did not contribute to possible biases was the fact that we did not approach psychosomatic or psychiatric diseases, nor conditions related to chronic pain and frequent use of painkillers. These confounding factors could compromise this specific HRQoL assessment.

### **Limitations of the study and applicability of the validated instrument**

One of the limitations of our study was the fact that it was not performed alongside other drug allergy referral centers in Brazil, which would provide a larger case series and a broader representation of patients with DHRs.

Ethnic and socioeconomic differences, as well as participation of patients with severe delayed cutaneous reactions, were not assessed in this study. These topics will be investigated in the future.

### **Conclusions**

This study enabled adequate translation and cultural adaptation of the DrHy-Q questionnaire, along with assessment of its psychometric properties according to guidance by the authors who developed it.<sup>6</sup> The Portuguese version of the DrHy-Q (Brazilian culture, DrHy-Qb) presented excellent reliability, construct validity, and reproducibility, which enables its use for evaluating the QoL of patients with drug hypersensitivity, in addition to directing treatment or psychological support to those who most need it. DrHy-Qb is a useful tool for assessing HRQoL in future Brazilian studies.

Nome: \_\_\_\_\_ Data: \_\_\_\_ / \_\_\_\_ / \_\_\_\_

As reações adversas aos medicamentos podem influenciar o bem estar físico e psíquico das pessoas. Pedimos que você indique abaixo as dificuldades que encontrou devido a esse problema.

	Nenhuma	Pouca	Razoável	Muita	Muitíssima
1. Como não posso tomar medicamentos, qualquer doença é mais limitante para mim que para outras pessoas.	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
2. Tenho medo que numa emergência me receitem um medicamento ao qual sou alérgico(a).	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
3. Fico apavorado(a) por causa do meu problema com os medicamentos.	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
4. O problema das reações aos medicamentos condiciona minha vida.	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
5. Gostaria da opinião do alergista antes de tomar medicamentos receitados por outro especialista.	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
6. Até um pequeno mal estar se torna um problema para mim.	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
7. O fato de não poder tomar tranquilamente os medicamentos me faz sentir diferente dos outros.	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
8. Fico ansioso(a) por causa do meu problema de reações aos medicamentos.	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
9. Para qualquer doença gostaria de ter certeza de que existe um medicamento que posso tomar tranquilamente.	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
10. Tenho medo de não poder tratar a dor.	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
11. Fico angustiado(a) por causa do meu problema de reações aos medicamentos.	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
12. Fico preocupado(a) toda vez que tenho que tomar um medicamento, mesmo diferente daquele que causou a reação alérgica.	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
13. Renuncio a ocasiões de lazer (esportes, férias, viagens) devido o meu problema.	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
14. Me sinto deprimido(a) por causa do meu problema de reações aos medicamentos.	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
15. A ideia de uma injeção ou aplicação de medicamento na veia me deixa ansioso.	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )

#### Annex 1

Portuguese version of the Drug Hypersensitivity Quality of Life Questionnaire (Brazilian culture) - DrHy-Qb

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