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# Quality of life in idiopathic pulmonary fibrosis in Latin American countries

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## Abstract

**Background** Idiopathic pulmonary fibrosis (IPF) is the most common Interstitial Lung Disease (ILD). It is characterized by dyspnoea and a progressive decline in lung function, which negatively affects life. This study aimed to evaluate Health-Related Quality of Life (HRQoL) in IPF patients in Latin American countries.

**Methods** Six countries (Argentina, Bolivia, Colombia, Chile, Mexico, and the Dominican Republic) enrolled patients with IPF. They answered the Saint George's Respiratory Questionnaire for Idiopathic Pulmonary Fibrosis (SGRQ-I) and the Hospital Anxiety and Depression Scale (HADS). Demographic characteristics, the Torvan index, and a lung function test were also assessed. IPF was diagnosed according to the ATS/ERS/JRS/ALAT 2018 criteria.

**Results** We enlisted 75 patients diagnosed with IPF; 81% were male, with an average age of 74 ± 7. The total SGRQ-I score was 49 ± 23, with a higher score in the activity domain of 70 ± 23. Torvan index average was 17 ± 6. We found that 28% presented anxiety and 35% depression. Besides, we observed that patients requiring oxygen had a worse quality of life (total SGRQ-I 62 ± 22 vs. 45 ± 22, $p = 0.003$) without finding differences in antifibrotic therapy. We did not find differences in HRQoL when dividing groups according to their altitude above sea level, except for a higher frequency of anxiety in patients living at sea level.

**Conclusions** We found similar data compared to those reported in real-life European populations. We also found that anxiety and depression are prevalent. However, they are often underdiagnosed and, therefore, left untreated.

**Keywords** Idiopathic pulmonary fibrosis, Quality of life, SGRQ-I, HADS

## Background

Idiopathic pulmonary fibrosis (IPF) remains the prototype of lung fibrosing diseases, one of the most common Interstitial Lung Diseases (ILD) in older men, characterized by worsening dyspnoea and lung function and consequently increased death [1, 2]. The median survival time for IPF from diagnosis is 2–4 years without treatment. These patients usually experience increasingly debilitating symptoms such as fatigue, cough, and weight loss, impacting their daily lives [3].

Since 2014, IPF patients have used antifibrotic treatments. However, these patients' Quality of life (QoL) is affected by both the disease and the adverse effects of

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the treatments. For this reason, there has been a growing interest in studying QoL through different tools, such as SGRQ (Saint George's Respiratory Questionnaire) [4], ATAQ-IPF (A Tool to Assess Quality of life in IPF) [5], Eq. 5D (European Quality Of Life-5 Dimensions) [6], K-BILD (ILD-specific King's Brief Interstitial Lung Disease questionnaire) [7], SF-36 (Short Form-36) [8].

The SGRQ-I is a self-administered questionnaire with three domains (symptoms, activity, and impact) exploring different disease aspects. It is a modified version that was validated for use in patients with IPF and recently translated and validated in Spanish [9].

It is crucial to assess the disease's impact on QoL due to the combination of symptom burden (cough, dyspnea, and fatigue), short survival, and limited treatment options through the health-related Quality of life (HRQoL). Research on HRQoL in IPF patients has been limited thus far. A recent systematic review and meta-analysis about HRQoL in IPF that included 134 studies revealed a notable increase in research efforts on HRQoL over the last 4–5 years [3]; however, only three studies were from Brazil, the rest were from Europe, North America, and Asia. The analysis demonstrated that HRQoL is markedly affected by IPF, with the most significant impairment observed in physical functioning [3].

In the insights-IPF registry evaluated HRQoL using different instruments, the authors reported a mean SGRQ total of 48.3 ± 20.7, with the highest score in the activity domain 62.3 ± 24.2 [10]. On the other hand, the Australian IPF registry showed similar results: mean SGRQ-I total score of 46.6 ± 20.9 with a score activity domain 61.9 ± 20.9 [11].

The reported HRQoL data in real life in IPF patients show more severe impairment than in randomized controlled drug trials, such as INPULSIS-Trial; SGRQ total 39.4 [12]. Additionally, evaluating the emotional state is very important as it has significant consequences on the Quality of life. Ye Jin Lee reported a prevalence of 25.9% of depression and 21.4% of anxiety in patients with IPF; they concluded that both depression and anxiety have a significant impact on the Quality of life of these patients [13].

In this context, we aimed to evaluate HRQoL in IPF patients in Latin American countries, comparing characteristics among countries with different altitudes, antifibrotic treatments, and supplemental oxygen requirements. We also aimed to correlate disease severity with HRQoL.

## Methods

We invited ILD care centers in six countries (Argentina, Bolivia, Colombia, Chile, Mexico, and the Dominican Republic) to complete two validated questionnaires assessing their Quality of life. Additionally, pulmonologists completed an online questionnaire detailing demographic characteristics and lung function test results.

Data collection was from November 2021 to November 2022. Informed consent to participate was obtained from all of the participants in the study. An identification code that includes the country's name, the first letter of the patient's name, and the date of birth was used to protect their identity. The study was conducted in accordance with the Declaration of Helsinki and approved by.

by their bioethics committees: Ethical-Research Committee, Metropolitan Health Service East of the National Thoracic Institute, Chile; Research Ethics Committee of the Colombian Pulmonology Foundation; Biomedical Bioethics Committee Bolivia; Research Ethics Committee of the Maria Ferrer Respiratory Rehabilitation Hospital Argentina; Ethics Committee of the Northern Union Medical University Clinic, Dominican Republic, and Bioethical and Research Committee of the Instituto Nacional de Enfermedades Respiratorias Mexico, with code C-4621.

The inclusion criteria were that IPF patients diagnosed according to diagnostic criteria of ATS/ERS/JRS/ALAT 2018 were current patients of the institutions. Sufficient knowledge to answer online Google forms makes it possible to fill out the questionnaires. Recently (three months) lung function test results [spirometry, Diffusion Capacity of the Lung for Carbon Monoxide (DLCO), 6-min walk test (6MWT) [14–16].

### Questionnaires and clinical data

We administered three questionnaires, two for patients and one for pulmonologists. The two for patients were the Saint George's Respiratory Questionnaire for IPF (SGRQ-I) [9] and the Hospital Anxiety and Depression (HADS) scale [17]. We also administered a questionnaire with sociodemographic and medical data (age, sex, body weight, comorbidities, current treatment, and oxygen requirements) [supplementary 1]. It was used only by pulmonologists.

### Functions test

Data on Forced Vital Capacity (FVC), DLCO, and meters walked. Oxygen Saturation (SpO2) during the 6MWT was registered, and we used the Global Lung Initiative (GLI) [18] for the interpretation of lung function tests. We calculated the Torvan Index [19], including comorbidities, age, FVC predicted percent, and DLCO predicted percent.

### Statistical analysis

Data were collected in Excel and analyzed with Stata 13.1 (Stata Corp LP, College Station, TX, USA) and R Studio IDE 1.4.1103.

**Table 1** Sociodemographic data and lung function test in the study population

| **Age, years (± SD)** | ***n*** **= 75** **74 ± 7** |
|---|---|
| Smoking status | 27 (36) |
| Never smoker (%) | 3 (4) |
| Current smoker (%) | 45 (60) |
| Former smoker (%) | |
| BMI, kg/m$^2$ (± SD) | 26 ± 4 |
| **Lung function test** | |
| FVC, predicted (± SD) | 77 ± 22 |
| DLCO adjusted, predicted (± SD) | 56 ± 19 |
| **6-min walk test** | |
| meters (± SD) | 378 ± 149 |
| With O2 (± SD), *n* = 31 | 339 ± 156 |
| Without O2 (± SD), *n* = 44 | 406 ± 135 |
| SpO2 at rest % (± SD) | 94 ± 3 |
| With O2 (± SD), *n* = 31 | 94 ± 3 |
| Without O2 (± SD), *n* = 44 | 93 ± 3 |
| SpO2 at the end of test % (± SD) | 84 ± 7 |
| With O2 (± SD), *n* = 31 | 82 ± 8 |
| Without O2 (± SD), *n* = 44 | 86 ± 6 |

BMI: Body Mass Index, FVC: Forced Vital Capacity, DLCO: Diffusion Capacity of the Lung for Carbon Monoxide, SpO2: oxygen saturation, With O2: supplemental oxygen during the 6MWT, Without O2: in ambient air

We used mean and standard deviation (SD) for quantitative variables' frequency and qualitative variables' percentages. The students' t-test and Fisher's F exact test were used to analyze the quantitative clinical variables of the two groups. Spearman's correlation coefficient was used to compare lung function tests with relevant demographic variables.

## Results

We enrolled 80 patients diagnosed with IPF, 81% of whom were male. Five patients were excluded due to incomplete data. The recruitment percentages from different countries were as follows: Argentina, Colombia, and Mexico recruited 27% each, Chile 9%, the Dominican Republic 8%, and Bolivia 2%. Our patients' time frames of evolution varied, with an average of 2.5 years. Sociodemographic data and lung function test results are presented in Table 1.

In our cohort, 31 patients needed to walk with oxygen, and 44 walked without it. The criterion for using supplemental oxygen is that, during baseline conditions, the patient's resting saturation is less than 88%. We analyzed both groups and observed differences with the worst values in the group that required oxygen during the 6MWT (Table S1).

Figure 1 illustrates comorbidities. The Torvan Index was evaluated, yielding an average score of 17 ± 6. In the HADS questionnaire, 61% of the participants scored > 8. Among this group, 28% presented symptoms of anxiety, while 35% experienced symptoms of depression. Furthermore, we observed higher scores in the SGRQ-I's activity domain (Fig. 2).

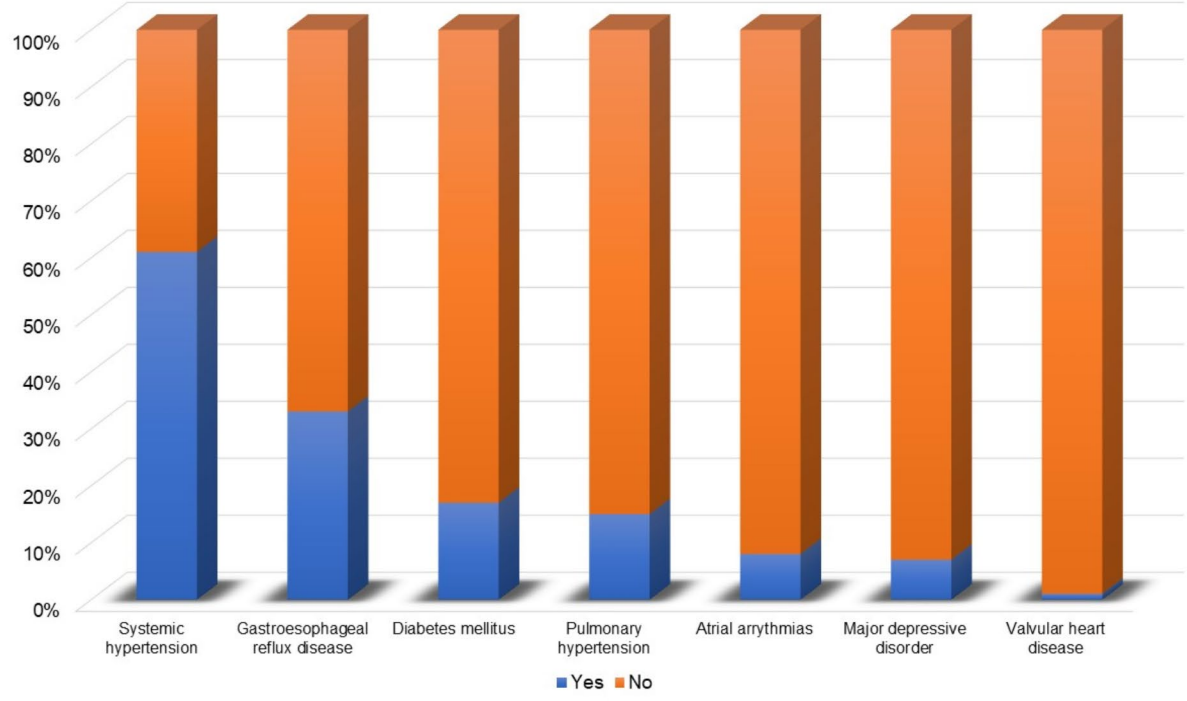


**Fig. 1** Frequency of comorbidities in the cohort

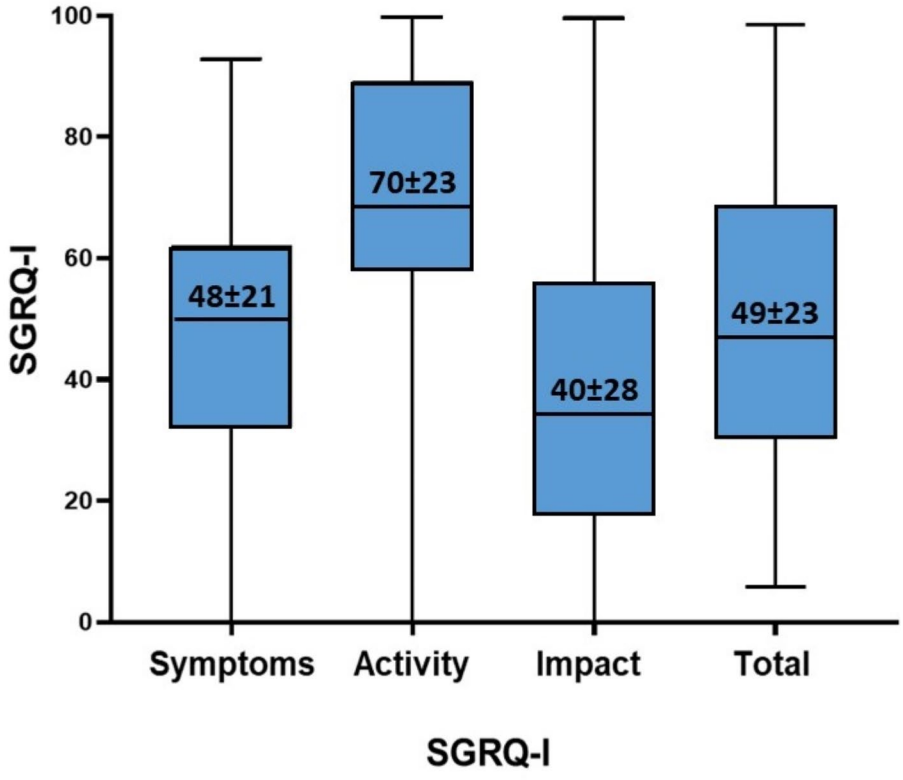


**Fig. 2** Distribution of score SGRQ-I in all three domains: symptoms, activity, and impact

Of all our patients, 81% received antifibrotic therapy, 60% received pirfenidone, and 40% received Nintedanib; the average duration of antifibrotic treatment was 30 ± 29 months. Interestingly, only 16% received psychological treatment, 5% received palliative care, and, unfortunately, none received lung transplant treatment.

Regarding correlations, we found positive correlations between the score on the SGRQ-I questionnaire, anxiety depression, and the Torvan index. On the other hand, there was a negative correlation with the lung function test, as shown in Fig. 3.

We divided the recruiting countries into two groups based on their altitude above sea level: the high-altitude group (Bolivia, Colombia, Mexico) and the sea-level group (Argentina, Chile, and Republican Dominican). The sea-level group had a higher frequency of arterial hypertension [78% vs. 48% ($p = 0.008$)] compared to the patients in the high-altitude group.

Regarding the 6MWT, SpO2 at the start and the end of the test was lower in the higher altitude cities than in those above sea level [93 ± 4 vs. 95 ± 2, $p = 0.006$ and 82 ± 6 vs. 88 ± 6, $p < 0.0001$ respectively). When comparing the questionnaires, we found a unique difference in the presence of anxiety, with a higher frequency in the sea-level group [48% vs. 12% ($p = 0.0006$). We found no differences in questionnaires as we show in Table S2.

In the patients requiring supplemental oxygen, we identified an increase in SGRQ-I score, HADS scale, and the Torvan index, while the lung function tests were lower in the patients requiring supplemental oxygen Table 2.

## Discussion

This study corroborates sociodemographic and clinical characteristics in Latin American IPF patients similar to those reported in the REFIPI study [20]. However, interestingly, this international multicentric study is the first to assess HRQoL in patients with IPF in Latin American countries.

We found similar data in SGRQ-l scores reported in European studies, with a total SGRQ-I score of 49 ± 23 and a higher score in the activity domain 70 ± 23 [10, 11]. A systematic review of HRQoL has demonstrated a profound impairment of quality of life in IPF patients, with physical health domains being the most severely impacted [21].

The safety of antifibrotic agents results in our population is similar as reported in clinical trials. These antifibrotic drugs reported adverse effects that we could infer

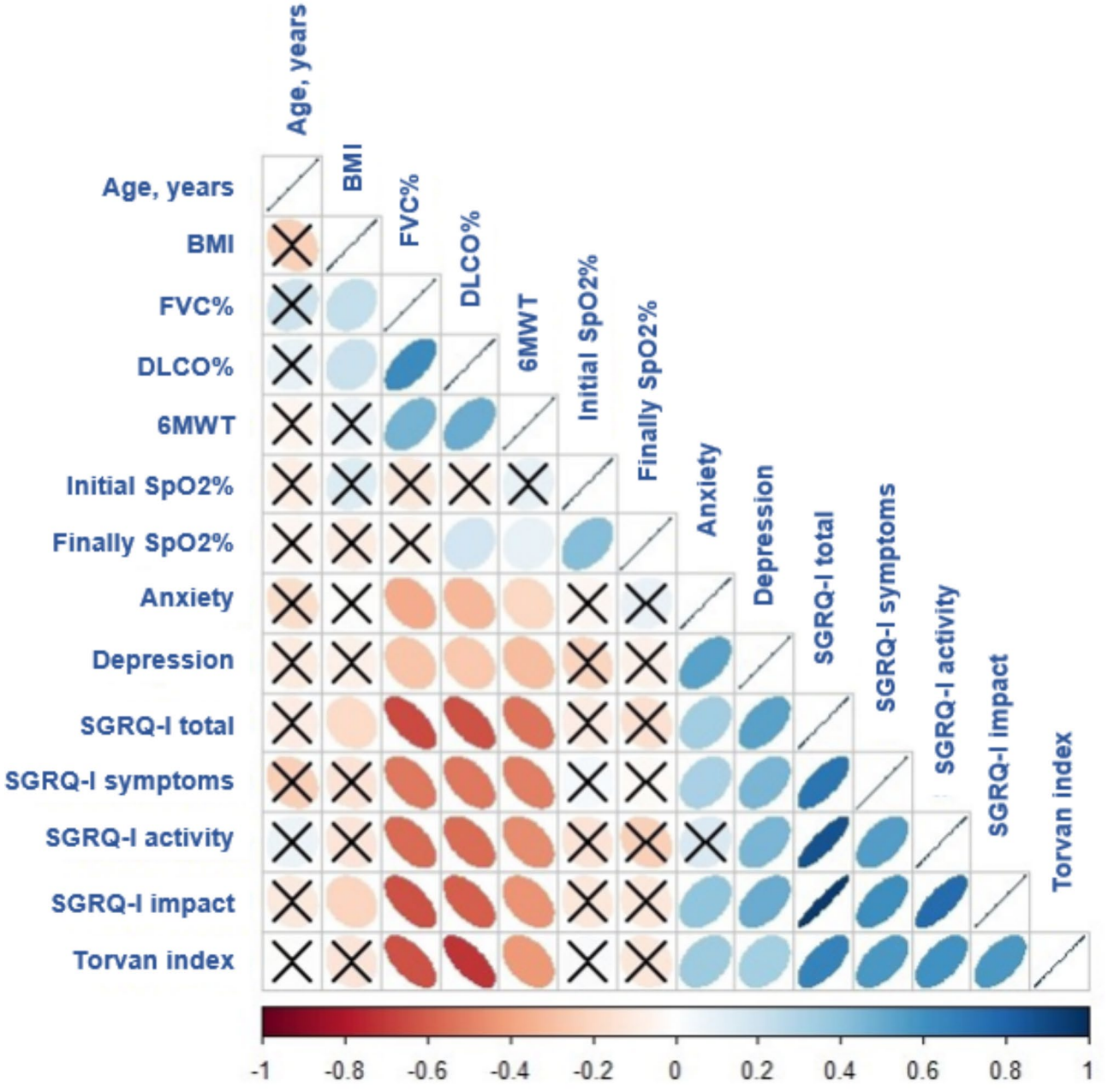


**Fig. 3** Correlations between variables of interest. A cross means no significant correlation ($p > 0.05$). (BMI: Body Mass Index, %FVC: Forced Vital Capacity, predicted, %DLCO: Diffusion Capacity of the Lung for Carbon Monoxide, 6MWT: 6-min walk test, SpO2: oxygen saturation)

worsened HRQoL, but in our results, antifibrotic therapy did not modify HRQoL and lung function tests.

Concerning the comorbidities in IPF patients, this study showed a negative correlation between the Torvan index and lung function test, at this point it is important to mention that no patient had been diagnosed with lung cancer, which is a comorbidity with a variable prevalence of 3 to 48% [22].

We observed a positive correlation between depression and worse HRQoL, which has been reported as a determinant of HRQoL [23]. The presence of depression or anxiety significantly influences patients HRQoL; Lee and Col. reported that for patients with anxiety, SGRQ-I scores were significantly higher than those of patients without anxiety (40.5 versus 23.5; $p = 0.003$) [8]. In our study, we found a positive correlation between higher

**Table 2** Sociodemographic data, results of questionnaires and lung function test according to long-term use of supplementary oxygen

| Variables | With oxygen supplementary *n* = 20 | Without oxygen supplementary *n* = 55 | *p* |
|---|---|---|---|
| Age, years (± SD) | 72 ± 7 | 75 ± 8 | 0.12 |
| Gender, male (%) | 18 (90) | 42 (76) | 0.32 |
| BMI, kg/m$^2$ (± SD) | 26 ± 5 | 27 ± 4 | 0.49 |
| **Questionnaires** | | | |
| SGRQ-I, activity (± SD) | 80 ± 22 | 66 ± 23 | 0.01 |
| SGRQ-I, symptoms (± SD) | 61 ± 20 | 43 ± 20 | < 0.0001 |
| SGRQ-I, impact (± SD) | 54 ± 28 | 35 ± 27 | 0.009 |
| SGRQ-I, total (± SD) | 62 ± 22 | 45 ± 22 | 0.003 |
| HADS (± SD) | 8 ± 6 | 10 ± 7 | 0.06 |
| HADS, anxiety (± SD) | 8 ± 6 | 5 ± 4 | 0.04 |
| HADS, depression (± SD) | 6 ± 5 | 5 ± 5 | 0.26 |
| Torvan index (± SD) | 20 ± 5 | 16 ± 6 | 0.002 |
| **Lung function test** | | | |
| FVC, predicted (± SD) | 64 ± 22 | 81 ± 19 | 0.001 |
| DLCO adjusted, predicted (± SD) | 43 ± 14 | 59 ± 20 | 0.003 |
| 6MWT, meters (± SD) | 317 ± 168 | 398 ± 135 | 0.01 |

BMI: Body Mass Index, %FVC: Forced Vital Capacity, predicted, %DLCO: Diffusion Capacity of the Lung for Carbon Monoxide, 6MWT: 6-min walk test

SGRQ-I scores and both anxiety (Rho 0.34, p 0.002) and depression (Rho 0.54, $p < 0.0001$).

The comorbidities less studied, such as anxiety and depression, are underdiagnosed. A study conducted in two Latin American countries found a frequency of anxiety and depression of 27% in patients with ILD [24]. On the other hand, in patients with IPF, the prevalence of depression ranges from 23% [25] to 49% [26] and anxiety at 27–60% [24]. In our study, we observed a frequency of 28% for anxiety and 35% for depression; however, only 16% were undergoing psychological therapy, and more concerning, only 7% had been diagnosed with major depressive disorder. These results are relevant because the optimal clinical treatment must be multidisciplinary, as the diagnosis involves pharmacological treatment, psychological support, and patient/caregiver education [27]. Even some authors have proposed that non-pharmacological interventions should be individualized [28].

Besides, we demonstrated a correlation between a progressive decline in lung function and a reduced quality of life, as well as elevated anxiety and depression scores. This data is consistent with previous studies [10, 12]. Additionally, concerning the Torvan index as a predictor of mortality, we found an average similar to that reported in Latin American countries [29], with a correlation to worse quality of life (Rho 0.66, $p < 0.0001$); in other studies, an association was found between quality of life and gap index [10, 30].

Like other investigators, we observed that HRQoL was more impaired in patients requiring supplemental oxygen [13, 30]. In the pivotal phase of three trials evaluating Nintedanib and pirfenidone (each versus placebo), no deterioration in quality of life was demonstrated with antifibrotics [12, 31].

Finally, we did not find significant differences when comparing groups by altitude above sea level. As expected, patients living at sea level have better oxygen saturation. Contrary to expectations, we found that patients who live at sea level have a higher frequency of anxiety. However, we did not evaluate the variables that could be causing this effect, such as economic problems, culture, and religion.

Among the strengths of our study is that it is the first multicenter study to assess anxiety and depression in IPF. Furthermore, it benefits from the reliability of IPF diagnosis since the patients were sourced from specialized IPF reference centers. Additionally, we employed specific and validated questionnaires to evaluate depression, anxiety, and quality of life.

A significant limitation of our study is a relatively small. We didn´t registry cultural and social variables which could affect quality of life. Further research are needed to discern sociocultural aspects affecting the quality of life of these patients.

## Conclusions

Our study is the first multicenter study conducted across several reference centers in Latin America to assess HRQoL in patients with IPF, and our findings are similar to those reported in real-world studies involving the European population We also found that anxiety and depression are prevalent; however, it is underdiagnosed and therefore not treated.

### Abbreviations

| | |
|---|---|
| 6MWT | 6-min walk test |
| ATAQ-IPF | A Tool to Assess Quality of life in IPF |
| DLCO | Diffusion Capacity of the Lung for Carbon Monoxide |
| EQ5D | European Quality Of Life-5 Dimensions |
| FVC | Forced vital capacity |
| GLI | Global Lung Initiative |
| HADS | Hospital Anxiety and Depression Scale |
| HRQoL | Health-Related Quality of Life |
| ILD | Interstitial Lung Diseases |
| IPF | Idiopathic pulmonary fibrosis |
| K-BILD | ILD-specific King's Brief Interstitial Lung Disease questionnaire |
| QoL | Quality of life |
| SD | Standard deviation |
| SF-36 | Short Form-36 |
| SGRQ-I | Saint George's Respiratory Questionnaire for Idiopathic Pulmonary Fibrosis |
| SpO2 | Oxygen Saturation |

## Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12890-025-03506-2.

Supplementary Material 1

Supplementary Material 2

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**Author contributions**
Study conception and design: B.R.I and A.D.H, data collection: A.D.H, F.M, G.G.M, R.A.E, A.M, C.F, T.E, V.E, C.N, S.M, F.M, F.C; analysis and interpretation of results: A.D.H, F.M, G.G.M, B.R.I: draft manuscript preparation. A.D.H. and B.R.I. All authors reviewed the results and approved the final version of the manuscript.

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**Data availability**
We do not have any research data outside the submitted manuscript file.

## Declarations

**Ethics approval and consent to participate**
The research ethics committees of each participating country approved the study: México: Comité de Ética e Investigación Instituto Nacional de Enfermedades Respiratorias. Argentina: Comité de Ética en Investigación Hospital María Ferrer. Colombia: Comité de Ética en Investigación de la Fundación Neumológica Colombiana. República Dominicana: Comité de Bioética Clínica Universitaria Unión Medica del Norte. Bolivia: Comité de Bioética Biomédica. Chile: Comité Ético-cientíco Servicio de la Salud Metropolitano Oriente del Instituto Nacional del Tórax. Informed consent to participate was obtained from all of the participants in the study.

**Consent for publication**
Not applicable.

**Competing interests**
The authors declare no competing interests.

**Clinical trial number**
Not applicable.

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