European Journal of Clinical and Experimental Medicine

ONLINE FIRST

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Authors: Elżbieta Małujło-Balcerska, Maria Gałecka, Karol Jackowiak

Article type: Review

Received: 6 June 2026

Accepted: 7 October 2026

Published online: 13 November 2026

eISSN: 2544-1361

Eur J Clin Exp Med

doi:10.15584/ejcem.2026.4.5

ONLINE FIRST Eur J Clin Exp Med

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Health-related quality of life and anxiety/depression in pulmonary sarcoidosis and idiopathic pulmonary fibrosis – a narrative mini review

Elżbieta Małujło-Balcerska [1], Maria Gałecka [2], Karol Jackowiak [2]

[1] Department of Pneumology, Medical University of Łódź, Łódź, Poland

[2] Maria Sklodowska-Curie Memorial District Hospital, Zgierz, Poland

Corresponding author: Elżbieta Małujło-Balcerska, e-mail: elzbieta.malujlo-balcerska@umed.lodz.pl

ORCID

EMB: https://orcid.org/0000-0002-0061-6353

MG: https://orcin.org/0009-0005-1365-5270

KJ: https://orcid.org/0009-0007-0335-2940

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ABSTRACT

Introduction and aim. The diagnosis of a somatic illness can lower a patient's health-related quality of life (HRQoL) and may also lead to anxiety/depression and vice versa.

This narrative mini-review aimed to synthesize and critically discuss the available knowledge on HRQoL, anxiety/depression in patients with pulmonary sarcoidosis and IPF, with particular emphasis on their prevalence and determinants, assessment tools, and interventions that may improve psychological well-being and HRQoL.

Literature search. The main search concept was to analyze literature related to psychological well-being and the management of psychological burden in pulmonary sarcoidosis and IPF. To prepare for this review, data presented in PubMed available until June 2026 were selected. The literature was selected using the following keywords: HRQoL, anxiety/depression and pulmonary sarcoidosis or IPF, methods to treat anxiety/depression, and methods to improve the HRQoL and pulmonary sarcoidosis or IPF. The types of studies included observational studies, single epidemiological studies, randomized clinical studies, meta-analyses, and reviews.

Analysis of the literature. Based on available research and data, psychological burden and impairments in HRQoL have been consistently reported in patients with lung diseases such as pulmonary sarcoidosis and IPF. Both pulmonary sarcoidosis and IPF are characterized by the presence of depression, anxiety, fatigue, and decreased cognition. Other disturbances include a decrease in physical capabilities in pulmonary sarcoidosis, feeling of pain, and discomfort in IPF. Appropriate interventions such as pulmonary rehabilitation (PR), online education, exercise training, cognition-based therapy may reduce

anxiety/depression and improve HRQoL in patients with pulmonary sarcoidosis. In IPF, PR, physical activity, caregiver support, result in better psychological management of this disease.

Conclusion. Impaired HRQoL and symptoms of anxiety/depression represent clinically relevant components of the disease burden in both pulmonary sarcoidosis and IPF; that routine assessment of these patient-reported and psychological outcomes may be clinically valuable.

Keywords. anxiety/depression, health-related quality of life, idiopathic pulmonary fibrosis, lung diseases, pulmonary sarcoidosis

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Introduction

The diagnosis of somatic diseases is often related to stress, which can worsen health-related quality of life (HRQoL) and contribute to psychological burden and the appearance of anxiety/depressive and vice versa.[1,2]

High-prevalence somatic diseases include respiratory diseases, such as asthma and chronic obstructive pulmonary disease (COPD), and rarely diagnosed respiratory diseases, such as pulmonary sarcoidosis and idiopathic pulmonary fibrosis (IPF).[3,4]

The presence of anxiety/depression is manifested by the feeling of fear, dread, and uneasiness; the presence of a long-term low mood or sadness; and the appearance of hopelessness and helplessness. Low self-esteem and feeling of sadness are known characteristics of depression.[5] The term HRQoL covers personal health, the influence of illness and its management on patients' disability, routine functioning, and the ability to have a satisfactory life.[6]

Sarcoidosis is a disease, with pulmonary involvement seen in many of the patients. The main cause of sarcoidosis has not been well explored, but environmental and occupational factors have been reported to play crucial roles in its development. The key pathobiological and pathogenic mechanisms of sarcoidosis include inflammation and the formation of sterile granulomas[7]. In particular, inflammation can be a risk factor for evaluating anxiety/depression and HRQoL in patients with pulmonary sarcoidosis. Recently, our group examined low-grade inflammation-related molecules in the development of mood disturbances in patients with active pulmonary sarcoidosis and those in remission.[8] We found that levels of C-reactive protein (CRP) and interleukin (IL)-6 were markedly higher in patients with fatigue (including active sarcoidosis and remission) than in non-fatigued patients in remission. Moreover, the IL-6 concentration was associated with fatigue and depression levels.[8]

Idiopathic pulmonary fibrosis (IPF), like other lung diseases, may be characterized by the presence of anxiety/depression and negatively affects HRQoL. Idiopathic pulmonary fibrosis is a chronic lung disease with pathophysiology being poorly understood; however, inflammation-related mechanisms are thought to contribute to its pathogenesis.[9] Moreover, inflammation-related genes have been recently shown to be involved in IPF development.[10]

Most anxiety/depressive disorders have multifactorial backgrounds. However, immune- and inflammation-related pathways have been extensively investigated and appeared to participate in presence of anxiety/depression.[11] Moreover, the diagnosis of pulmonary sarcoidosis and IPF may itself induce stress, whereas anxiety/depression are stress-related conditions.[11] Immune–inflammatory mechanisms may importantly participate in appearance of anxiety/depression in inflammation-related pulmonary diseases suggesting the involvement of common pathways.

Both pulmonary sarcoidosis and IPF disease are two separate illnesses belonging to intestinal lung diseases, and both may result in psychological burden. Based on data from the available literature, knowledge regarding psychological wellbeing in pulmonary sarcoidosis and IPF is not widely analyzed. synthesized, discussed, and compared with respect to both pulmonary sarcoidosis and IPF. The novelty of this narrative mini-review lies in the parallel synthesis of evidence on HRQoL, anxiety/depression in pulmonary sarcoidosis, and IPF, with particular emphasis on the assessment tools used, determinants of psychological burden, and potentially modifiable interventions. When considering these two interstitial lung diseases within a common patient-centered framework, the review also identifies methodological heterogeneity and areas that require standardized evaluation and further investigation.

Aim

This narrative mini-review aimed to summarize and critically discuss the available evidence on HRQoL, anxiety/depression in patients with pulmonary sarcoidosis and IPF, with particular emphasis on its prevalence and determinants, assessment tools, and interventions that can improve psychological well-being and HRQoL.

Literature search

To prepare this mini-review, we analyzed and included data presented in PubMed, from original, observational studies, as well as from single epidemiological studies, clinical studies, meta-analyses, and reviews available from 1993 until June 2026 with main concentration on studies from last 10 years. The chosen studies were restricted to English language with an exception of one study.

We identified related papers using mainly the following keywords:

-HRQoL, pulmonary sarcoidosis, IPF;

-anxiety/depressive symptoms, pulmonary sarcoidosis, IPF;

-methods and tests used to assess HRQoL, pulmonary sarcoidosis, IPF;

-methods and tests used to assess anxiety, depressive symptoms, pulmonary sarcoidosis, and IPF;

-methods to improve HRQoL, pulmonary sarcoidosis and IPF;

-methods to lower/treat anxiety/depressive levels, pulmonary sarcoidosis and IPF.

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Analysis of the literature

On the basis of available research and data, HRQoL impairments and the presence of anxiety/ depression have been consistently demonstrated in patients with pulmonary sarcoidosis and IPF.

Pulmonary sarcoidosis

Prevalence of health-related quality of life impairments and the presence of anxiety and depression

Based on the findings presented in the following from observational studies, an association exists between impaired lung function and increased life stress in patients diagnosed with pulmonary sarcoidosis, both of which may result in a reduction in HRQoL and the development of anxiety/depression.[12] Compared to healthy controls, the HRQoL of patients with active pulmonary sarcoidosis is negatively affected.[13] Important associations were found regarding value of markers of lung function markers such as forced expiratory volume in 1 second (FEV1) and forced vital capacity (FVC) and HRQoL.[14] An association analysis between pulmonary sarcoidosis and a high prevalence of psychiatric comorbidities revealed patients with sarcoidosis had a psychiatric diagnosis of anxiety/ depression. The diagnoses include major depressive disorder and anxiety disorder (25%, 5% respectively). In turn, the appearance of anxiety/depression in patients with pulmonary sarcoidosis influences their emotional well-being and HRQoL. Fatigue, a symptom of depression, is characteristically observed in pulmonary sarcoidosis.[15] Our group reported the presence of fatigue and depression not only in patients with active pulmonary sarcoidosis but also in patients in remission of this disease. [8] It is worth emphasizing that a reduction in HRQoL in patients with pulmonary sarcoidosis and their partners has been described.[16]

To present more detailed data, we provide a brief description of the results of sample questionnaires used in the literature in one of the studies published on pulmonary sarcoidosis.

In studies by Antoniou et al., researchers investigated whether the presence of active pulmonary sarcoidosis influences HRQoL and whether the HRQoL level of HRQoL correlates with pulmonary function test and disease duration. Scales and questionnaires used include: Borg's scale, oxygen cost diagram, modified Medical Research Council (mMRC) Dyspnea scale, St. George's Respiratory Questionnaire (SGRQ), Quality of Well-Being (QWB) Questionnaire, and Hospital Anxiety Depression Scale (HADS). The results demonstrate that the HRQoL of patients with active sarcoidosis is negatively affected compared to healthy controls. The duration is correlated with the BORG scale, which measures the intensity of physical and mental capabilities, as well as with the SGRQ, which assesses the effect of disease on general health, life activities, and levels of well-being.[13]

Intervention to improve health-related quality of life and to reduce anxiety/depression-related symptoms

Psychological burden is related to worsening clinical outcomes, and screening for the presence and treatment of anxiety/depression may help to reduce symptoms and improve HRQoL. Clinical interventions

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aimed at improving HRQoL and reducing anxiety/depression may be effective in improving patient outcomes. An important factor that deserves to be monitored in patients with pulmonary sarcoidosis is the presence of fatigue, which can be a prodromal symptom and is also a symptom of depression.[17] Recently, a randomized control trial revealed that the educational mHealth App, may have beneficial effects in lowering fatigue and improving HRQoL in pulmonary sarcoidosis.[18] Low skeletal muscle weakness are related to anxiety/depression in pulmonary sarcoidosis.[19] Exercise training is one of the pathways associated with HRQoL improvement and a reduction in anxiety and fatigue.[20] Pulmonary rehabilitation (PR) has been shown to significantly reduce anxiety/depression in patients with pulmonary sarcoidosis and improve HRQoL.[21] The influence of PR on symptoms of anxiety/depression in patients with interstitial lung disease has been widely described in a systematic review of randomized controlled trials.[22] On the basis of population-based studies, cognitive decline is a risk factor for depression development.[23] A randomized controlled trial observed decrease in anxiety/depression levels among patients participating in a 12 week website delivered mindfulness-based

Idiopathic pulmonary fibrosis

Prevalence of impairments in health-related quality of life and the presence of anxiety and depression

Cough, dyspnea, and decrease in FVC are important symptoms influencing levels of HRQoL in patients with IPF and are correlated with worsening in HRQoL levels.[25] Moreover, the presence of cough and dyspnea is associated with an appearance of anxiety/depressive in patients with IPF.[26] Observed, independent predictors of anxiety in IPF are: increased value of mMRC scale and increase in nadir SpO_2 while walking, whereas risk of depressive disorder are determined by increase in high mMRC value and an increasing comorbidities.[27]

Observational studies exploring HRQoL and anxiety/depression in a cohort of IPF patients have observed disturbances in HRQoL and symptoms characteristic of anxiety/depression from low to high severity. These symptoms determine HRQoL levels and are correlated with disease duration.[28,29] Worsening HRQoL and psychological burden have been associated with low levels of confidence and the appearance of fatigue.[30,31,32]

Similarly, as mentioned in the section on pulmonary sarcoidosis, we provide an example of the results of the questionnaire and analysis used in patients with IPF. Tzanakis et al. explored the presence of anxiety/depression and HRQoL in IPF patients using HRQoL questionnaires, including the SGRQ, the QWB scale and HADS. They noted different values on the scales used for IPF patients than on those used for controls, meaning psychological burden. Lung volume correlated significantly with the SGRQ. The duration of the disease and the dyspnea scales were associated with the SGRQ and HADS results.[29]

The burden of impaired emotional well-being is not only in European populations of patients with IPF. An epidemiological study conducted in a Japanese population evaluated functional status in patients with IPF

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and revealed that 30% of the participants reported pain, discomfort, and the appearance of anxiety and/or depressive symptoms.[33] Anxiety/depression are similar to European countries; however, they are more underdiagnosed in Latin countries. and therefore left untreated.[34]

Intervention to improve health-related quality of life and to reduce anxiety/depression-related symptoms

Disturbances in HRQoL and anxiety/ depression are characteristically found among IPF patients. Even when more effective drugs are used to treat IPF, psychological and psychosocial interventions may be helpful for these patients. Therefore, interventions to reduce anxiety/depression levels and improve HRQoL of patients with IPF, as well as exploration of the mechanisms underlying the development and treatment of anxiety/depression, are important. IPF pharmacotherapy is known to benefit the main outcome of the diagnosis, as reviewed by Denis et al. 35 Recently, it has been reported that even short-term use of nintedanib is associated with a reduction in the presence of anxiety/depression.[36] In addition to pharmacotherapy, other strategies may help regulate HRQoL in IPF patients.[37] In accordance with the hypothesis of Swigriss et al., the use of PR is a call for continued investigation of HRQoL in patients with IPF.38 Pulmonary rehabilitation is associated with increased functional capacity and decrease in fatigue levels in IPF patients.[38] Psychological support and PR are a part of multidirectional patient education aimed at improving HRQoL and reducing anxiety/depression among patients with IPF.[39] Short, medium and long durations of PR correlate positively with high levels of HRQoL.[40] Home rehabilitation is effective in improving mood and reducing anxiety and depression.[41] Treatments of PR improve overall clinical outcomes of IPF patients, including well-being and HRQoL, as confirmed by systematic review of randomized trials.41

Furthermore, daily activity and its control are important when evaluating the clinical outcomes of patients with IPF, including depression.[42] Exercise training is positively correlated with improving HRQoL in patients with IPF.[43] Caregivers are known to importantly participate in improving the HRQoL patients diagnosed with IPF. After participating in hospital support programs, caregivers were found to be less stressed, while patients were less isolated and less worried about their future.[44,45] Furthermore, IPF is characterized by the presence of cognitive dysfunction, one of the features of depression, and physical activity is known to positively affect cognitive levels.[46]

Discussion concerning the comparison between pulmonary sarcoidosis and IPF regarding prevalence of impairments in health-related quality of life and the presence of anxiety and depression and intervention to improve health-related quality of life and reduce anxiety/depression-related symptoms

Both pulmonary sarcoidosis and IPF diagnosis are found to be associated with reduced HRQoL. Patients with pulmonary sarcoidosis and IPF experience anxiety/depression, fatigue, and decreased cognition.[14,15,24,28,29,32,46] In pulmonary sarcoidosis, an association exists between low levels of HRQL and

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decrease in lung function measured by the pulmonary function test and the duration of the disease.13 Similarly, in IPF, low levels of parameters of the pulmonary function test and disease duration may influence HRQoL.[29] Low HRQoL levels in IPF also are related to the presence of cough and dyspnea, which can subsequently result in anxiety/depression.[25,26] Assessing the severity of dyspnea with mMRC scale may be considered as predictors of anxiety, while the presence of low value of SpO_2 and the presence of comorbidities are suggested as predictors of depression[27]. Due to the disease-related deterioration in HRQoL in patients with both diseases, various methods of improving well - being are suggested and analyzed. A significant factor in worsening HRQoL is poorer lung function. In both pulmonary sarcoidosis and IPF, the use of PR is confirmed effective and has stronger evidence from randomized controlled trials and systematic reviews to improve HRQoL and psychological burden.[22] Cognition therapy was also was found beneficial confirmed by randomized control trial in pulmonary sarcoidosis.[24] Similarly, another randomized control trial confirmed the role of online education in better well-being in pulmonary sarcoidosis.[18] In IPF physical activity and family members' education were found associated with better HRQoL.[43-45] Regarding IPF it is worth highlighting that patients well tolerated antifibrotic therapy have better psychological well-being compared to those experiencing side effect and not treated with the standard of care.[36]

It should be emphasized that results from clinical trials and provided from systematic reviews have the strongest evidence for improving HRQoL or psychological outcomes while comparing findings from preliminary/observational studies. Most existing studies are observational and involve varying populations, sample sizes, age ranges, sex, and stages of the diseases. Additionally, there is a lack of large epidemiological data on psychological comorbidities across different regions. Scales and questionnaires used to assess HRQoL, as well as anxiety/depression, differ between studies, which complicates direct comparisons. Given these issues, most of the findings remain preliminary, but nonetheless significant. More research could confirm these results and suggest effective methods to ensure repeatability. Standardized assessments, using the same tests regarding group selection and tools, yielding greater result repeatability and reliability of the results.

Different scales and questionnaires are used to examine aspects of HRQoL in patients with pulmonary sarcoidosis and IPF. The questionnaires used to assess HRQoL, psychological well-being, and anxiety/depression among patients with pulmonary sarcoidosis and IPF are shown in Table 1.

Table 1. The use of questionnaires to assess psychological well-being and anxiety/depression associated with health-related quality of life in patients with pulmonary sarcoidosis and IPF

Pulmonary sarcoidosis	**IPF**
HRQoL assessing tools	HRQoL assessing tools
Airway diseases specific:	Airway disease specific:

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- St. George's Respiratory Questionnaire13 measures impact on overall health, daily life, and perceived well-being by measuring symptoms, limitation and social and emotional impact of the disease and total[47]	- St. George's Respiratory Questionnaire[29]- evaluating health impairments, measure impact on overall health, daily life, and perceived well-being by measuring symptoms, limitation and social and emotional impact of the disease and total[47]
Generic:	- Visual Simplified Respiratory Questionnaire[40] - a HRQoL Questionnaire assessing dyspnea, anxiety, depression symptoms, sleep disturbances, level of energy, daily activities, social activities and sexual life[55]
- Quality of Well-Being Questionnaire[13]- evaluating mobility, physical and social ability, physical and mental symptoms[48]	Specific Interstitial Lung Disease:
- Quality of Life Enjoyment and Satisfaction Questionnaire [14]- measures daily enjoyment and satisfaction level, health, work, and social life[49]	- King's Brief Interstitial Lung Disease Questionnaire[31] with three domains: psychological, breathlessness and activity, chest and total[56]
- Short Form 36 version[14] –evaluating physical and mental health, including level of physical activity, dealing with work and daily tasks, pain, health status, presence of anxiety, depression symptoms, level of emotional well-being[50]	Generic:
	- Quality of Well-being Questionnaire[29] - a standardized health-related quality of life questionnaire that evaluates mobility, physical and social ability, physical and mental symptoms[48]
	- Euro QoL Five-dimension, Five -level Questionnaire[31] is an HRQoL Questionnaire. It encompasses mobility, self-care, usual activities, pain, and anxiety[57]
Anxiety/depression assessing tools	Anxiety/depression assessing tools
Generic	Generic
- Hospital Anxiety and Depression Questionnaires – screening and monitoring the presence and levels of anxiety/ depression in non-psychiatric medical illness[51]	- Hospital Anxiety and Depression Questionnaire – screening and monitoring the presence and levels of anxiety/ depression in non-psychiatric medical illness[51]

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	- Generalized Anxiety Disorder -7 Questionnaire [31] – is a tool to evaluate and estimate the severity of symptoms of generalized anxiety[58] - Patient Health Questionnaire-9[31]- is a depression-related questionnaire for the process of screening, making diagnoses, and controlling depression during clinical and nonclinical conditions[59]
Fatigue assessing tool Generic: - Fatigue Assessment Scale [15]– designed to assess general fatigue, evaluating level of physical and mental fatigue[52]	Fatigue assessing tool Generic: - Check List Individual Strength Fatigue Subscale[32] – that measures fatigue severity, concentration problems of concentrations, reduction in motivation and activity[60] Fatigue Catastrophizing Scale[32] is a scale used to assess the severity of negative thoughts and recognize patterns toward experienced fatigue[61]
Illness perception: Generic: - Illness Perception Questionnaire [14] - assess cognitive and emotional demonstration of illness; cognitive illness, emotional illness and illness comprehensibility representation[53] - Beliefs about Medication Questionnaire [14] – assess patients' beliefs and worries about taking medication for their disease[54]	

Study limitations

The article is a narrative mini-review, and we are aware of this approach. There is a lack of systematic review procedures, a single-database search without a repeatable search strategy, and no risk-of-bias assessment for the included studies, which may lead to selection bias and poor reproducibility. Epidemiological data are not integrated. To evaluateassess HRQoL, presence of anxiety/depression more high-quality studies would be effective in organizing promising methods to examine HRQoL level,

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depression/anxiety in patients diagnosed with pulmonary sarcoidosis and IPF. We clearly state that this mini- review cannot be considered an exhaustive or systematic synthesis of all available evidence.

Conclusion

Impaired HRQoL and the presence of anxiety /depression represent clinically relevant components of the disease burden in both pulmonary sarcoidosis and IPF, routine evaluation of these patient-reported and psychological outcomes may be clinically valuable; and that pulmonary rehabilitation, exercise-based interventions, psychological support, and selected multidimensional interventions appear promising, although the evidence is heterogeneous. Nevertheless, studies on anxiety/depression symptoms and impairments in HRQoL in pulmonary sarcoidosis and IPF have some limitations and larger prospective studies, standardized assessment instruments, and well-designed interventional studies are needed.

Declarations

Funding

The authors declare that no funds, grants, or other support were received during the preparation of this manuscript.

Author contributions

Conceptualization, E.M.B.; Methodology, E.M.B.; Investigation, E.M.B. and M.G.; Resources, E.M.B., M.G. and K.J.; Writing – Original Draft Preparation, E.M.B., M.G., and KJ.; Writing – Review & Editing, E.M.B., M.G., and K.J.

Conflicts of interest

The authors have no relevant financial or non-financial interests to disclose.

Data availability

No datasets were generated or analyzed during the current study.

Ethics approval

Not applicable

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