Perception of Gratitude During a Mindfulness-Based Intervention in Patients with Interstitial Lung Disease

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Abstract

**Background:** Interstitial lung diseases (ILDs), regardless of their etiology, have an impact on patient quality of life at some point. Dyspnea, which is the most common symptom, cannot be treated with the main drugs available. Alternatives such as pulmonary rehabilitation, oxygen supplementation, yoga, and mindfulness practices can help in the care of patients with ILD.

**Objective:** To explore the perceptions of gratitude by patients with various ILDs during a mindfulness-based intervention.

**Methodology:** This was a qualitative study involving 50 patients with various ILDs. Data were collected through transcription of expressions of gratitude during weekly sessions. For the qualitative evaluation of the data, a six-phase thematic analysis was used.

**Results:** The results obtained allowed the construction of five thematic categories of gratitude: recognition of the existence of a God, religious beliefs being evident in the statements of several patients, who relied on it as a strategy for coping with the disease; the possibility of autonomy, perceived in the importance placed upon being able to perform simple, routine tasks; the presence of family and friends; the assurance of treatment by the health care team and the treatment itself; and the changes achieved through the mindfulness training.

**Conclusion:** Despite the severity and limitations imposed by the disease, the participants were able to perceive the importance and meaning of the presence of family and friends, spirituality, the medical team, and mindfulness in their lives.

Introduction

Interstitial lung diseases (ILDs) constitute a heterogeneous group of diffuse lung diseases with variable clinical, radiographic, and histological features that commonly result in pulmonary fibrosis.\(^1\)\(^2\) Regardless of the etiology, the main symptom associated with ILDs is progressive dyspnea, typically accompanied by fatigue and chronic cough.\(^3\) Those are the symptoms that will most affect patients at the end of life, leading to reduced quality of life with psychological and emotional implications.\(^3\) Specific pharmacological treatments for ILDs have no effect on dyspnea. The two antifibrotics approved for the treatment of IPF (nintedanib and pirfenidone) are able to reduce the number of respiratory events that lead to acute exacerbation and hospitalization. However, neither provides a significant reduction in dyspnea or a significant improvement in quality of life.\(^3\) A number strategies have been employed to alleviate dyspnea in patients with ILDs, including oxygen supplementation, pulmonary rehabilitation, and the use of low doses of opioids.\(^3\) However, there is still limited data regarding the effectiveness of those treatments in patients with pulmonary fibrosis.\(^3\) Interventions to reduce dyspnea in patients with pulmonary fibrosis have been declared to be a priority by patients, caregivers, professionals, and researchers.\(^4\)
Mindfulness can be defined as the practice of paying attention to the present moment through experiences that challenge us. The mindfulness-based stress reduction (MBSR) program was created in 1979 by Kabat-Zinn. The MBSR program integrates ancient meditation practices into contemporary clinical and psychological practice. Although MBSR was initially developed experimentally to treat groups of patients with chronic pain, it has, after being standardized, been widely adopted for the treatment of other disorders in both fields.

The practice of examining feelings of gratitude, which is an integral part of the MBSR program implemented at the Hospital das Clínicas and School of Medicine of the Federal University of Minas Gerais, can have a positive impact on quality of life and reduce psychological distress in patients with serious illness. The practice of expressing gratitude is an intervention encouraged in mindfulness-based interventions (MBIs). According to Rashid and Seligman, as well as Seligman alone, the experience of cultivating gratitude involves realizing and valuing what is positive in life. It is recognized that the expression of gratitude has effects on vitality and spirituality, is associated with positive emotions, optimism, life satisfaction, and a reduction of depression. In the first study of an MBI in patients with ILD, Sgalla et al. observed improvements in mood and in the perceived stress level after the intervention.

The aim of this study was to explore the perceptions of gratitude by patients living with various ILDs during an MBI.

**Materials And Methods**

This was a qualitative study involving patients with various ILDs. All of the patients evaluated were being followed at the Interstitial Lung Disease Outpatient Clinic of the Federal University of Minas Gerais Hospital das Clínicas, in the city of Belo Horizonte, Brazil.

During a two-month period (from April 1 to May 30 of 2021), eligible patients were informed of the methods and objectives of the study, after which they were invited to participate in the MBI. The study was approved by the Research Ethics Committee of the Federal University of Minas Gerais (Reference no. 33842520.1.0000.5149), and all participating patients gave written informed consent. The participants were free to withdraw at any time before the start of data analysis and no incentives were offered for participation.

The following inclusion criteria were applied: being ≥ 18 years of age; having been diagnosed with ILD in accordance with the international multidisciplinary classification for idiopathic interstitial pneumonia proposed by Travis et al.; having access to the telephone network and the internet; and having a modified Medical Research Council dyspnea scale score ≥ 1. Patients who were enrolled in any pulmonary rehabilitation program were excluded, as were those who practiced other modalities of meditation and those who had dyspnea due to other causes, such as heart failure, cardiac arrhythmia, pulmonary thromboembolism, and sequelae of tuberculosis.
To improve acceptance, we divided the participants into two groups. Participants attended MBI sessions once a week for eight consecutive weeks in 2021: June 1 to August 19 and August 26 to October 28. All sessions were conducted online, via Google Meet, and each lasted for 1 hour. Participants were encouraged to practice one of the techniques that would be learned each week, at home, at least once a day, during the following week. From the second session onward, they also completed a weekly “check-in” form, on which they recorded the frequency of the practice of meditation, physical activity, conscious eating, writing in the diary, and expressions of gratitude.

In the first session (week 1), the participants received a lecture on the pathophysiology of stress and an introduction to the MBI. The first technique taught was meditation. In all other sessions, the following were carried out (Fig. 1): completion of the check-in form; initial mindfulness meditation intervention; gratitude practice (participants should choose something they were grateful for that week and speak about it spontaneously); and the introduction and practice of a new mindfulness technique. In the first and last sessions, the following quality of life questionnaires were administered: the King's Brief Interstitial Lung Disease questionnaire; the Leicester Cough Questionnaire; and the Depression, Anxiety and Stress Scale.

Throughout the study, clinical care was the responsibility of the medical coordinator of the outpatient clinic. The MBI interventions were performed by a professional with more than 20 years of experience in MBI practice and by a graduate student working under the supervision of that professional. All MBI and gratitude practice were conducted in English, this was the only language of all participants. The other researchers were responsible for recording and transcribing, in full, the statements of each patient in reference to gratitude. The name of each interviewee has been replaced by the letter “I” and a number, in order to protect their privacy. The team agreed that data saturation had occurred after the 8 MBI as the participant’s experiences that were being shared were similar and no new information was being shared. Using a form developed specifically for this study, we collected sociodemographic, clinical, and functional data from patient medical records.

**Data Analysis**

The thematic analysis framework by Braun and Clarke was used with a focus on latent themes and included the following steps: data immersion, code creation, exploration of themes, revision, identification and clarification, and report completion.

**Reliability**

After conducting the gratitudes, the recordings were transcribed by one of the researchers (1st), and then she and three other researchers (2nd, 3th and 5th ) carefully reviewed the transcripts to ensure that all information was typed. The authors are concerned with maintaining methodological rigor throughout the research process. Thus, the transcripts of the interviews were read line by line and coded independently by the investigators, two of whom had experience in conducting qualitative studies (2nd and 5th
The researchers (1st, 2nd, 3rd and 5th) met regularly to discuss the themes and the best sentences that exemplify them. Any differences were resolved through discussion to reach a consensus.

Results

Of the 55 patients invited, five declined to participate in the MBI. In addition, two patients with advanced disease died during the study period. The sociodemographic, clinical, and functional characteristics of the participants are shown in Table 1. The results obtained from the participant reports during the MBI allowed the construction of five categories (Fig. 2), as detailed below.
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>(N = 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years), mean (SD)</td>
<td>58.6 (14.1)</td>
</tr>
<tr>
<td>Female, n (%)</td>
<td>36 (72)</td>
</tr>
<tr>
<td>Weight (kg), mean (SD)</td>
<td>69.3 (14.6)</td>
</tr>
<tr>
<td>BMI (kg/m²), mean (SD)</td>
<td>26.4 (5.4)</td>
</tr>
<tr>
<td>Diagnosis, n (%)</td>
<td></td>
</tr>
<tr>
<td>CTD</td>
<td>18 (36)</td>
</tr>
<tr>
<td>FPF</td>
<td>11 (22)</td>
</tr>
<tr>
<td>IPF</td>
<td>8 (16)</td>
</tr>
<tr>
<td>HP</td>
<td>6 (12)</td>
</tr>
<tr>
<td>LAM</td>
<td>2 (4)</td>
</tr>
<tr>
<td>Sarcoidosis</td>
<td>2 (4)</td>
</tr>
<tr>
<td>Other ILDs</td>
<td>3 (6)</td>
</tr>
<tr>
<td>Treatment, n (%)</td>
<td></td>
</tr>
<tr>
<td>Nintedanib</td>
<td>13 (26)</td>
</tr>
<tr>
<td>Pirfenidone</td>
<td>7 (14)</td>
</tr>
<tr>
<td>Mycophenolate mofetil</td>
<td>7 (14)</td>
</tr>
<tr>
<td>Cyclophosphamide</td>
<td>6 (12)</td>
</tr>
<tr>
<td>Oral corticosteroid</td>
<td>4 (8)</td>
</tr>
<tr>
<td>Azathioprine</td>
<td>4 (8)</td>
</tr>
<tr>
<td>None</td>
<td>6 (12)</td>
</tr>
<tr>
<td>Other drugs</td>
<td>3 (6)</td>
</tr>
<tr>
<td>Use of oxygen supplementation, n (%)</td>
<td>13 (26)</td>
</tr>
</tbody>
</table>

CTD: connective tissue disease; FIP: familial pulmonary fibrosis; IPF: idiopathic pulmonary fibrosis; HP: hypersensitivity pneumonitis; LAM: lymphangioleiomyomatosis; Other ILDs: pulmonary drug toxicity, pleuroparenchymal fibroelastosis, and bronchiolitis obliterans; Other drugs: rituximab, methotrexate, and sirolimus; FVC: forced vital capacity; FEV₁: forced expiratory volume in the first second; DLCO: diffusing capacity of the lung for carbon monoxide; 6MWD: distance covered on the six-minute walk test.
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>(N = 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death, n (%)</td>
<td>2 (4)</td>
</tr>
<tr>
<td>Lung function, mean (SD)</td>
<td></td>
</tr>
<tr>
<td>FVC, L</td>
<td>2.2 (0.69)</td>
</tr>
<tr>
<td>FVC, % predicted</td>
<td>66.4 (17.6)</td>
</tr>
<tr>
<td>FEV\textsubscript{1}, L</td>
<td>1.8 (0.6)</td>
</tr>
<tr>
<td>FEV\textsubscript{1}, % predicted</td>
<td>66.3 (17.5)</td>
</tr>
<tr>
<td>FEV\textsubscript{1}/FVC</td>
<td>83.0 (10.4)</td>
</tr>
<tr>
<td>DLCO, % predicted</td>
<td>51.2 (21.9)</td>
</tr>
<tr>
<td>6MWD, m</td>
<td>340 (182)</td>
</tr>
</tbody>
</table>

CTD: connective tissue disease; FIP: familial pulmonary fibrosis; IPF: idiopathic pulmonary fibrosis; HP: hypersensitivity pneumonitis; LAM: lymphangioleiomyomatosis; Other ILDs: pulmonary drug toxicity, pleuroparenchymal fibroelastosis, and bronchiolitis obliterans; Other drugs: rituximab, methotrexate, and sirolimus; FVC: forced vital capacity; FEV\textsubscript{1}: forced expiratory volume in the first second; DLCO: diffusing capacity of the lung for carbon monoxide; 6MWD: distance covered on the six-minute walk test.

Recognition of the Existence of a God

Many of the participants in our study referred to religiosity and faith as a way of maintaining hope in the face of adversity. Religious belief was evident in the statements of several patients, who professed to use it as a strategy for coping with the disease:

“I thank Him for everything, you know? In everything we should give thanks, right? For life, and for the good times and the bad too.” (I3)

“So, I’m grateful to God, I’m grateful to everyone who’s been helping me so much in this recovery.” (I12)

“I am grateful to God and for all the good things that happen. As difficult as things seem to be, in our lives there often appears someone to help us, a provision, a situation, something to cheer us up.” (I1)

“We don’t have to think about illness, we have to think about living. I thank God every day for this blessing.” (I37)

The Possibility of Independence

Some participants reported the importance of being able to perform simple, routine tasks.

“This week I managed to walk three times.” (I3)
“And yesterday I even managed to go to the supermarket, I went to the grocery store. .. These are things I haven’t done because I get very tired.” (I4)

“Gratitude and acceptance for doing what you can do, without demanding too much there. Doing everything we do with joy, we forget what we wanted to do and we can’t handle it anymore.” (I1)

“Just getting out of bed and being able to do my things during the day is a reason for gratitude too. On days that I get to do my things, I’m happy. Happy with my life. Washing clothes, tidying up the yard, when I can, I’m happy.” (I44)

The Presence of Family and Friends

Some participants expressed gratitude for moments of coexistence with loved ones.

“A lot of good things happened. My children came to see me. I get very lonely, feeling very isolated.“ (I47)

“And yesterday I spent a very good afternoon with a friend, we exchanged ideas about sewing, we both enjoyed it very much. .. My afternoon was very good.” (I41)

“My gratitude is the same I see in everyone, it is for my family. Family really is one of the most important things.” (I35)

“And I’m grateful, you know, that I’m able to stay in contact with all the people I like.” (I48)

In many participant statements, the value of the presence of loved ones was even greater due to the restrictions imposed during the COVID19 pandemic, when the sessions were held:

“My son with two grandchildren came to spend the weekend here in this house with us. And it was a great joy, because this grandson is a big boy now and it had been a long time since I was with him because of the pandemic.” (I18)

“Yesterday I visited a friend who I hadn’t seen since the pandemic started (.. .) It was nice to visit with her. She was very happy and so was I.” (I41)

The Assurance of Treatment

The participants highlighted the importance of personalized, humanized consultation Gratitude for the health care team and for the treatment received was identified in many of statements:

“My gratitude today is for the team at Hospital das Clínicas. I won’t name names, but they are angels who helped me. At the time I was hospitalized, so as not to forget one or the other, I will thank them in general, for everything they did for me.” (I36)

“My gratitude goes to the medical team, for the work you do. (.. .) you are angels that improve the life of human beings, of us, providing happy moments and making us feel a little more alive again, more satisfied, removing the limitation and pain that bother us so much.” (I1)
“I was very depressed when I discovered my disease, I wanted to die, then I talked to Dr (.. .), I started in this group, and I’m doing very well, getting better every day.” (I42)

“Thank you very much. Many thanks to Dr. (.. .), everything she has done for me, the concern, you know? I got a message from her asking if I was doing well. Wow, how wonderful, a message from a doctor who takes care of us worried about us. . .” (I45)

There was also an emphasis on gratitude for access to medication, oxygen, examinations, and respiratory therapy:

“Well, my gratitude for the week is that I was able to undergo an exam that had been pending since March.” (I37)

“I’m taking a new medication, and I’m doing well.” (I35)

“I’m very grateful to God and to Dr. (.. .) that I got home oxygen therapy.” (I22)

The changes achieved through mindfulness

Many individuals expressed gratitude for the well-being provided by the MBI.

“My gratitude today goes out to the tranquility that mindfulness is providing me. I am very calm now.” (I10)

“This group is teaching us to be calmer, more patient. For me it was very good. Because I was like that, very nervous, very agitated. (.. .) We even talk with other people about the group, you know, and they say, ‘yes, we really noticed the improvement, the change.’” (I16)

“It’s been wonderful being with you, it has improved my concentration a lot; I’m a really anxious person, and now I’m able to concentrate very well.” (I30)

“I realized that after having this meeting with you, it seems that the problem I had was psychological, every little thing made me short of breath, my heart was racing, you know? I realized that I am very well, you know? So, I thank you here. (.. .) I saw that I improved a lot, even my self-esteem.” (I23)

“And my greatest gratitude is for this group, right? Supporting each other, giving testimonials, and each one helping the other.” (I31)

“And so, thank you also for allowing me to be a part of this group. Knowing about everyone there. Knowing about other people’s victories is a victory for me.” (I37)

“Gratitude to everyone who shared a little of their stories, their gratitude inspires us.” (I38)

Discussion
Being faced with a serious disease whose progression is inevitable and which imposes a loss of functionality proportional to increases in the severity of its symptoms is quite challenging. Strategies to minimize physical and mental suffering can directly influence the quality of life and quality of death for such patients. As previously mentioned, specific treatments for fibrosing diseases have little effect on quality of life and dyspnea.  

The main perceptions recorded in the present study show that the expressions of gratitude during an MBI can be divided into five categories: religious belief; independence; family and friends; medical treatment; and the mindfulness training itself. Those domains act as allies in attempts to balance efforts to continue coping with the disease.

It can be said that gratitude is an antidote to negative emotions, promotes resilience, and bolsters resistance to stress, as well as cultivating a feeling of emotional and social well-being. As a positive emotion, gratitude activates the parasympathetic autonomic nervous system and promotes an increase in vagal tone. It activates areas of the brain involved in perceptions of reward, morality, and positive social interactions.

The religiosity and faith as a way of maintaining hope in the face of adversity was evident in the statements of several patients who professed as a strategy for coping with the disease. Religion is often cited as a positive touchstone to help with life’s challenges. In a study that included patients with chronic obstructive pulmonary disease, 45% of the patients reported using religious strategies to deal with their disease. Positive religious coping methods are significantly associated with better mental health, general well-being, lower perceived stress level, greater self-esteem, and the perception of a meaningful life. In addition, religious individuals tend to have fewer pain symptoms, better immune system function, better adherence to treatment, and lower suicide rates. The positive emotions that religious practices can generate tend to improve anxiety/depression and even have physiological effects (decreasing the heart rate and oxygen consumption). In another analysis, gratitude to God was found to reduce frustration with health care and to minimize the depression caused by financial difficulties, thus providing comfort, a sense of control, and hope during stressful life circumstances. In the last 30 years, psychiatry has adopted a more receptive attitude towards religion and spirituality, with a significant increase in the number of scientific articles addressing this topic in the literature.

As research on gratitude gained more attention, the relationship between gratitude and religion began to be investigated. It is noteworthy that religious people express gratitude more often than do nonreligious people. Those findings may come from the belief that religious people tend to regard God as the source of all good things, regardless of whether they are traditional religious practitioners who attend church regularly or affirm their spirituality in an alternative way. In addition, religiosity significantly correlates with religious or spiritual coping strategies, which in turn are correlated with greater gratitude.
Another domain perceived in our analysis was gratitude for the treatment received. Patients associated medical care with feelings of hope and acceptance in the face of the diagnosis of fibrosis. They highlighted the importance of personalized, humanized consultation. The behavior of the physician and the care team, together with the quality of their interaction with patients, is fundamental to how patients perceive good care, no less so than the medical care itself. There are some premises related to the medical team-patient relationship that must be strictly pursued: patients want to be heard; patients expect that the team will be interested in them as human beings, and not as their disease or body part; patients expect the team to be competent and well informed; and, most importantly, patients expect not to be abandoned. All of those aspects must be governed by the principles of bioethics: providing a benefit, acting without malice, preserving autonomy, and advocating justice.

In keeping with our results, Althaus et al., exploring gratitude among patients in palliative care, found that family and friends are a very frequently cited domain of gratitude. In their analysis, those authors recognized that interpersonal relationships are crucial for patients in palliative care, because they contribute to a meaningful life. Another aspect considered is that a person’s gratitude for another underscores the magnitude of the feelings of social distress, commitment, and satisfaction with others. According to Heekerens et al., the practice of cultivating gratitude also allows individuals to establish connections between their present life and future dreams, as well as to reflect on their relationships with significant others, whether family or friends.

As for the references to independence in the participant reports of gratitude in the present study, it has been reported that people who continue to carry out their ADLs independently present better self-efficacy and general well-being than those who do not. In general, diseases that predispose to limitation and loss of function, which often occur in individuals with ILDs, limit the ability to perform complex ADLs before limiting the ability to perform the simplest, most basic ones. Toledano-González et al. analyzed well-being in the elderly in terms of its association with optimism, self-esteem, and the performance of ADLs. The authors found that variables related to well-being showed moderate correlations with participation in social activities and activities outside the home.

In addition to the benefits of mindfulness itself, our patients also reported gratitude for being in the group and felt supported by being able to spend time with others who were living with the same disease (pulmonary fibrosis). Some even reported being inspired by hearing expressions of gratitude from the other participants. In a review of the literature on MBIs performed in individuals with multiple sclerosis, the “feeling of belonging” was also described, translating to a sense of shared identity and solidarity. As in the present study, that review showed that patients cited the importance of listening to the experiences of others facing similar challenges, enabling the sharing of ideas on how to deal with the disease.

Our study has some limitations. The first is that we did not apply specific questionnaires such as the 6-item gratitude questionnaire, which is often cited in articles on the topic. However, that questionnaire has...
not been validated for use in Brazil and does not allow a complete understanding of the individual characteristics of gratitude (e.g., it does not take the quality of the relationships into consideration). In addition, our study has all of the limitations inherent to its cross-sectional design. However, it is noteworthy that most of the published studies on this topic are of the same design.

In conclusion, the information explored during the gratitude practice made it possible to recognize that, despite the severity and limitations imposed by the disease, the participants supported themselves in the belief of a higher power. They were also able to perceive the importance and meaning of the presence of family members and friends in their lives, as well as expressing their gratitude for the medical staff and the mindfulness training.

Declarations

Acknowledgments: The authors would like to thank the respondents for their participation.

Author contributions: EVM, SMDM and SPCP contributed to the study design. GPAA and ANAL contacted the participants. EVM, SMDM and SPCP analysed the qualitative data. All authors contributed to data interpretation, and drafted, revised and approved the manuscript for publication.

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Ethics approval: Ethics approval was obtained by the Research Ethics Committee of the Universidade Federal de Minas Gerais (Reference no. 33842520.1.0000.5149); operational approval from the provincial health authority.

Availability of data and materials: The data that support the findings of this study are available on request from the corresponding author on reasonable request.

Competing interests: The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors. The authors have not declared a specific grants or contracts from any entity, royalties or licenses and Consulting fees.

References


Figures

Figure 1
MBI Structure

- The possibility of independence
- Recognition of the existence of a god
- The presence of family and friends
- The changes achieved through mindfulness training
- The assurance of treatment

Figure 2
Gratitude domains.