

## **Benefits of Socialization Activities in a Pulmonary Rehabilitation Program**

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**Received:** November 09, 2020; **Published:** November 30, 2020

### **Abstract**

**Background:** During the course of advanced pulmonary disease, patients may have affective and emotional changes, which worsen the response to treatment adherence-especially when associated with anxiety and depression. We evaluated patients with advanced pulmonary disease through specific questionnaires before and after socialisation activities (SAs) during a pulmonary rehabilitation programme.

**Materials and Methods:** The comparative study carried out in the Pulmonary Rehabilitation Programme during a year period observation for early-stage pre-experiment. Along with physical training, SAs were provided such as surfing lessons, tennis, choir, and human foosball classes to stimulate social interaction. Forty pulmonary rehabilitation programme participants were evaluated with the Self-Reporting Questionnaire (SRQ-20) and Saint George's Respiratory Questionnaire (SGRQ).

**Results:** Of the 40 pulmonary rehabilitation programme participants, 38 participants completed the study and participated in SAs. The SRQ-20 scores significantly improved in 49% of patients; 77% of patients were emotionally stable. The findings of patients with a statistically significant improvement and a positive score indicated that a combination of SAs with a pulmonary rehabilitation programme may improve the functional status and the aspects associated with the existence of common mental disorders. The same phenomenon occurred with the SGRQ questionnaire: 56.4% of patients had an improvement of more than 10% in the total score and 4% in the psychosocial domain.

**Conclusion:** A pulmonary rehabilitation programme with SA enhances the quality of life and emotional aspects in patients with advanced pulmonary disease.

**Keywords:** *Chronic Obstructive Pulmonary Disease; Advanced Lung Disease; Socialisation Activity; Quality of Life*

### **Introduction**

Advanced pulmonary disease (APD) is any serious lung disease, usually progressive and irreversible, that causes functional, structural, pulmonary, and systemic changes. The most common lung diseases are asthma and chronic obstructive pulmonary disease (COPD), which represent one of the greatest health problems worldwide [1].

Patients with APD may experience dyspnoea, hypoxemia, stress intolerance, anxiety, and depression. These comorbidities can influence the experience and management of the disease [2,3] and are associated with frequent exacerbations, greater use of medical resources, low quality of life, and increased mortality [4]. An interesting finding is that mental suffering also appears to contribute to disease progression.

Patients with APD start to experience losses in the labour and social fields because of their physical condition. As a consequence, performing activities of daily living (ADL) becomes impossible, which can cause anxiety, depression, and loss of self-esteem. Thus, such indicators of common mental disorders (CMDs) are extremely important for a health team to monitor to signal and establish early interventions, and thereby maintain the integrity of people's mental health without having a negative impact on quality of life [5,6].

A pulmonary rehabilitation programme (PRP) is a treatment available for APDs. It is an individualised and multidisciplinary programme that makes it possible to develop greater functional capacity in individuals, and to treat the mental suffering of these patients, and thereby improve their quality of life [7].

Socialisation activities (SAs) within PRP can contribute to the improvement of this situation [8] and promote social exchanges, thereby breaking the isolation and invalidation of patients. This factor aids in daily care and allows patients to be protagonists in their own medium, providing experiences [9].

Few studies exist on the association of SA with PRP.

### Aim of the Study

This study aimed to assess the CMD and the quality of life of patients with APD before and after PRP associated with SA.

### Methods

This was a comparative study carried out in the Pulmonary Rehabilitation Programme during a year period observation for early-stage pre-experiment.

This study was approved by the Research Ethics Committee under number CAAE: 17217119.9.0000.0082 and all signed the Free and Informed Consent Form.

The study included patients diagnosed with APD who were part of the PRP who participated in SAs. Patients were excluded if they did not participate in at least 50% of the SAs or did not answer the questionnaires before and after the PRP period.

During the PRP, SAS were proposed, which complemented physical training. The activities took place throughout the year. Patients could participate in new experiences that many had never experienced, as described below:

- I. Activities on the beach were attended by 38 patients, of whom 31 patients participated in sand walks and seven patients wanted to try different activities such as stand up paddle board and kayak. The tour took place at Enseada Beach in the city of Guarujá in São Paulo and lasted for a 6 hour period (Figure 1S).
- II. Choir: The choir event was attended by 38 patients who participated in trials that took place 2 months before the event, and lasted approximately 10 minutes, before physical activity, until the presentation. The party took place in December on the day of the fraternisation in one of the auditoriums (Figure 2S).

- III. Pilates: During the PRP, 30 patients had the opportunity to try a Pilates class, which lasted 45 minutes, in February. The postures and movements were adapted, based on the patients' clinical condition (Figure 3S).
- IV. Yoga: A yoga class in June, which lasted 45 minutes, was also adapted and consisted of postures and breathing methods. Thirty-two patients participated in the study (Figure 4S).
- V. Educational lectures: Three lectures were held: in March, a nutrition lecture with the theme 'Nutrition in Respiratory Diseases'; in July, a psychology lecture with the theme 'Depression and Anxiety in Respiratory Diseases'; and in September, a physiotherapy lecture with the theme 'The correct use of inhaled medications'. We had an average of 30 patients in each group (Figure 5S).
- VI. Confraternisations: This year, two parties occurred: the June Party took place in June approximately 30 patients participating, and the end of the year Confraternisation Party took place in December with the participation of 48 patients (Figure 6S).
- VII. Craft Group: All patients were invited, but only seven patients were interested in participating. Handicraft meetings take place once weekly, every month of the year. The group was open, so patients were at ease and could enter and leave at their discretion (Figure 7S).



(1S) Activities on the beach



(2S) Choir

(3S) Pilates



(4S) Yoga



(5S) Educational lectures



(6S) Craft Group



(7S) Craft Group

**Figure 1:** Representation of some socialization activities carried out in the pulmonary rehabilitation program. 1S- Activities on the beach-surf, stand up paddle and kayak; 2S- Choir-rehearsals and presentations; 3S- Pilates- postures and movements were adapted; 4S- Yoga adapted with postures and breathing methods; 5S- Educational lectures-with subjects directed to the clinic; 6S- Craft Group-development of free manual works.

All patients who participated in the SAs answered the Self-Reporting Questionnaire (SRQ-20) and the Saint George's Respiratory Questionnaire (SGRQ) at the beginning and end of one year.

The SRQ-20 screening instrument is intended to detect symptoms of CMDs, which are relevant to the primary levels of care. It also justified the performance of this study and fulfilled the proposed objective, which was to identify symptoms associated with DPA in PRP

patients. The SRQ-20 was developed by the World Health Organisation and has been used to measure the level of presence or absence of CMD. It does not discriminate against a specific diagnosis, but it does assess whether any mental disorder exists. It is a self-administered instrument, containing a dichotomous scale (yes/no) for each of your questions. Each affirmative answer scores with a value of 1 to compose the final score through the sum of these values. The scores obtained are related to the probability of the presence of a nonpsychotic disorder, ranging from zero (i.e. ‘no probability’) to 20 (i.e. ‘extreme probability’) [10]. A score  $\geq 7$  indicates mental suffering [11]. The profile of the patients and the composition of the SRQ-20 are divided into four factors for a better discussion of each point: factor I: anxious and depressed; factor II: somatic symptoms; factor III: decrease in energy; factor IV: depressive thinking.

The SGRQ is a questionnaire used to assess quality of life and address aspects related to three domains: symptoms, activity, and psychosocial impacts that a respiratory disease imposes on a patient. Each domain has a maximum possible score; the points of each answer are added and the total is referred to as a percentage of this maximum, and values above 10% reflect an altered quality of life in that domain. As a criterion for improvement, a value above 4% of the total score and/or of each domain is considered before and after an intervention. The SGRQ was translated and validated in Portuguese by Sousa, *et al.* in 2000 [12].

Qualitative variables were described by absolute and relative frequencies, and quantitative variables were described by the means and the standard deviation. The Shapiro–Wilkes test was used to assess the adherence of the data to the normal distribution, and to compare the averages of the pre period and post period. The Student’s t-test for paired samples was used. The level of significance was set at 5% ( $p < 0.05$ ). The statistical programme used was Stata, version 11.0 (StataCorp, Inc., College Station, TX, USA).

## Results

During one year, 113 patients were treated with PRP. Of these, 40 patients performed the PRP with SA (this n ended with the availability of patients to perform AS), based on the inclusion criteria, and 38 patients completed. Two patients did not finalise because exacerbated during period. The general characteristics of the patients are described in table 1. The results show a predominance of men (mean age, 66 years). The forced expiratory volume first second (FEV1) after bronchodilator was 46% (severe grade [13] and most patients were diagnosed with COPD).

| Demographic data   |                             |
|--------------------|-----------------------------|
| Gender F/M         | 15/23                       |
| Oxygen-dependents  | 11                          |
| Media $\pm$ SD     |                             |
| Age                | 66 $\pm$ 11                 |
| BMI                | 24 $\pm$ 6                  |
| FEV1 POS BD%       | 46 $\pm$ 19                 |
| Pathologies        | Media% (n <sup>o</sup> pct) |
| COPD               | 76.92% (30)                 |
| HAP                | 7.70% (03)                  |
| Pulmonary fibrosis | 5.13% (02)                  |
| Histiocytosis      | 2.60% (01)                  |
| Sequela TB         | 5.13% (02)                  |

**Table 1:** General characteristics of patients.

FEV1 POS BD%: Forced Expiratory Volume 1<sup>st</sup> Second Bronchodilator; COPD: Chronic Obstructive Pulmonary Disease; PAH: Pulmonary Arterial Hypertension; TB: Tuberculosis.

The patients' adherence to SAs was homogeneous, with the exception of the craft group. With regard to the SRQ-20 and SGRQ questionnaires, a significant improvement occurred in the patients after the activities (demonstrated by the difference in the pre and post AS questionnaire scores). Interest and adherence contributed to this finding (Table 2 and 3).

|                                  | PRE           | POS           | p      |
|----------------------------------|---------------|---------------|--------|
| SRQ20                            | 7 ± 5         | 5 ± 4         | 0,008* |
| SGRQ                             | 32,57 ± 11,89 | 29,71 ± 11,65 | 0,043* |
| *: Significant values (p < 0.05) |               |               |        |

Table 2: Final score of the applied tests.

| SGRQ Domains                                | PRE    | POS    | p     |
|---|--------|--------|-------|
| Psychological                               | 9 ± 4  | 8 ± 4  | 0,098 |
| Symptoms                                    | 11 ± 5 | 10 ± 6 | 0,479 |
| Activity                                    | 10 ± 3 | 9 ± 3  | 0,119 |
| *: Indicates a significant value (p < 0.05) |        |        |       |

Table 3: Scores by domain and total SGQR before and after the intervention.

With regard to the SGQR, patients showed a significant improvement in quality of life with SA (Table 2); however, with respect to the domains (Table 3), no significant improvement occurred.

With regard to the SRQ-20 questionnaire, a summary of the patients' responses, when considering all 'yes' answers for each question and which factor had more impact for this group, a greater distribution of responses was for the category of decreased vital energy, followed by depressive-anxious mood, somatic symptoms, and depressive thoughts.

In the investigations on decreased vital energy, the interviewees predominantly reported that they tired easily; in relation to depressive-anxious mood, most patients seemed to feel nervous, tense, or worried. Based on somatic symptoms, most of them had a lack of appetite and/or poor sleep. When assessing depressive thoughts, most interviewees appeared to feel useless and unable to have a useful role in their life.

It is worth mentioning that four patients who had suicidal ideation in the post-intervention period no longer had this idea. Of the four patients, two patients were diagnosed with pulmonary arterial hypertension and two patients with COPD. All of them still presented with mental suffering with improvement at the end of the treatment. They were followed up with individual therapeutic follow up.

Although the final result of the SRQ-20 showed that 58% of the patients had mental suffering and more than one-half of patients had an improvement in this period, as shown in table 4.

|  |     |
|--|-----|
| Patients without mental suffering  | 42% |
| Patients who had an improvement in the score, and were without suffering | 34% |
| Patients who improved, but continued to suffer                           | 13% |
| Patients who worsened  | 11% |

Table 4: The results (in percentage) of the final score of each patient.

## Discussion and Conclusion

In view of the demand and losses caused by DPAs, the present study is a pioneer in reporting the effects of a structured PRP associated with SA. In this study, psychosocial factors, assessed through the symptoms of CMD, were taken into account to encourage health promotion in a comprehensive manner. Identifying and treating CMD contribute to the preservation and improvement of patients' mental balance, which directly interferes with the degree of social participation.

Extensive reports in the literature indicate that PRP promotes significant and clinically relevant benefits for psychiatric disorders such as anxiety and depression [14-17]. In this study, these benefits were possible to identify, because CMDs, which are quite common in this population, decreased when they were associated with appropriate treatment and SA. One-half of the patients who had a positive score for mental suffering in the pre period achieved significant improvement after SA.

When analysing each part of the SRQ-20, in the depressive-anxious mood domain, the questions 'Do you feel nervous, tense or worried?' and 'Do you feel sad lately?' stood out because they were the most recurrent questions among patients and were only behind the question 'Do you get tired easily?'

The questionnaire considers tiredness as a lack of vital energy, but for these patients, it is already an expected symptom because of APD [1]. Therefore, to discuss how much this symptom is psychic, the physical factors, based on the FEV1 and the results of the 6-minute walk test [18], as it presents similarities related to the effort during the ADLs that consequently are reflected in the global functional capacity. Thus, the feeling of tiredness would be because of the APD rather than CMD [19].

In this domain, four of the six questions improved after the association of PRP with SA. The fact that patients report an improvement in fatigue full time shows the benefits of PRP, which is well established in the literature [20-22].

The symptoms of sadness decreased, the sense of usefulness, and the desire for social participation improved after the interventions. These factors demonstrated an improvement in TMC symptoms, which corroborates the findings of other studies [14,15]. Furthermore, this improvement is very important for this population because elderly people with APD are less active in their ADLs than healthy elderly people; these patients spend most of their time lying or sitting, in addition to walking with less intensity [23].

As for the somatic symptoms, all questions showed a significant improvement in the post-interventions, showing the importance of taking into account the associated factors between psychic and physical conditions. The questions 'Do you have a lack of appetite?' and 'Do you sleep badly?' [24,25] had a greater frequency, and both have an important impact on the maintenance of health within the framework of APD.

In our findings, the patients had an average body mass index (BMI) within the normal range, and only four patients had a mean BMI of 17, and 16 patients were overweight. Previous studies have shown how that nutritional status is important for patient survival and to minimise exacerbations [26]. These patients were followed up for guidance and a new food and sleep routine, together with the multidisciplinary team.

Regarding the domain of depressive thoughts, all questions showed significant improvement. Studies with the elderly have already proven that involvement in social and leisure activities in diverse environments that involve interaction with other people is important to predict physical and psychological well-being [27,28]. In 2015, a research [8] also reported that patients who participate in PRP have low self-esteem and self-image and affirming improvement in self-esteem of PRP associated with SA.

Another important fact is related to the question, 'Have you been thinking about ending your life?'. Evidence exists indicating a relationship between lung disease and suicidal behaviour among adults [29]. The four patients who reported suicidal ideation in the pre pe-

riod -denied this desire after the interventions. Studies have already discussed the possible impact of chronic diseases and age on suicidal ideation and the benefits of health support in this situation [30,31]. We emphasise that patients with this thoughts and other important ones related to depression be followed up in individual care with a psychologist and/or occupational therapist from the PRP team, but for this we reinforce the importance of investigating mental health in the DPA population.

The most common CMD in APDs is depression and/or anxiety, which when associated, results in a negative quality of life. In addition, studies have already shown that the impact of anxiety [32] in these patients is greater than in the general population and that quality of life is not restricted to mental and emotional conditions, but includes associations with pain, physical function, general health and specific manifestations of a disease such as worsening of the condition and symptoms of dyspnoea [19].

Depression and anxiety interfere with the prognosis of APD and increases the risk of exacerbations and possible death. By contrast, DPA increases the risk of developing depression. These bidirectional associations suggest the importance of investigating the association between these diseases to consider a direct and effective therapeutic intervention [33]. Despite the frequency of depression and anxiety in patients with chronic diseases, little attention has been paid to the specific role of these conditions in the quality of life related to the health of these patients [19].

The data related to the SGRQ questionnaire are shown in table 2 and 3, and demonstrate that, in the total score of the questionnaire, patients significantly improved ( $p = 0.008$ ). The domains improved but were not statistically significant.

This study showed an improvement in the SRQ-20 and the SGRQ questionnaire, which indicated that the PRP associated with SA, allowed patients to feel safer to resume and/or start new activities adapted to their current health condition, Even when a PRP has physical training as its main focus [8], it was possible to observe that participating in the PRP and, consequently, giving new meaning to their occupational roles, can contribute to increased involvement in leisure and social participation [34].

According to one study [35], a high proportion of elderly people who are inactive in leisure activities have a higher prevalence of CMD. The author suggests prioritising actions directed at mental health and programmes that the encouragement of physical activity among the elderly, and the contribution of this behaviour in the treatment and prevention of psychic morbidities.

The results of the present study demonstrated that the domain of the SGRQ post-intervention improved, but not significantly. In addition, compared to the results of the SRQ-20, the SGRQ was insufficient in assessing the mental health issues of these patients, and required a complementary questionnaire. Based on the findings of this study, we suggest that the SRQ-20 is a good research tool, which is already used for evaluating other chronic diseases [36].

With physical limitations, many patients with APD stop working and become socially isolated, which can cause a loss in the quality of life, thereby leading to depression and anxiety [37]. This study demonstrated that including patients in SAs can increase quality of life and decrease mental suffering in general. A PRP also positively influences psychosocial morbidities such as anxiety, depression, and personality styles such as introversion, sensitivity, strength, somatisation, and hostility [38]. Compared to healthy individuals, patients with APD have reduced physical performance and general health status and tend to be more socially isolated [39].

In general, the performance of SA is a new practice in the treatment of APD and, as a consequence. The association of PRP with SAs seems to further enhance psychosocial benefits, owing to the opportunity to be in a group of people who have the same difficulties and daily overcoming difficulties, thereby promoting a feeling of belonging [40].

This study has some limitations: it had a small sample size, SAs were punctual, and it did not allow the assessment of which activity had the most impact. Some patients had difficulty in attending the PRP because of the severity of their disease and socioeconomic difficulties that interfered with adhering to a treatment and because of a lack of knowledge of the service.



This work was carried out in a single service and with a convenience sample. However, its results can be used to direct new treatment proposals for patients with APD and have more precise objectives regarding the mental health care of this population.

We can conclude SAs, when added to the PRP, can enhance the benefits in the quality of life and improve the TMC symptoms of patients with APD. This study's findings indicated that the SRQ 20 questionnaire was functional for CMD and a good instrument to be added in an assessment. By highlighting that, despite the multiple nature of emotional disorders, the instrument demonstrated the ability to identify factors that together denote essential characteristics for screening mental health in the elderly with APD.

### Acknowledgment

Faculdade de Medicina do ABC - Pulmonology of FMABC.

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**Volume 9 Issue 12 December 2020**

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