

## Tele-Rehabilitation: A Cost Effective Avenue for COPD Management in the Developing World

**Anand Agrawal\***

*Professor and Head, Department of Respiratory Medicine, BPSGMC(W) KK, Sonapat, Haryana, India*

**\*Corresponding Author:** Anand Agrawal, Professor and Head, Department of Respiratory Medicine, BPSGMC(W) KK, Sonapat, Haryana, India.

**Received:** January 20, 2020; **Published:** March 27, 2020

Pulmonary rehabilitation in advance stage of COPD is an essential component as pharmacological management. The American/British Thoracic society as well as Global Initiative for Chronic Obstructive Lung Disease (GOLD) recommends multidisciplinary pulmonary rehabilitation (PR) for patients with persistent exercise intolerance despite receiving optimal medical therapy [1]. Patients with COPD report an extreme declines in physical activity, significant losses in quadriceps muscle strength as well as exercise tolerance during hospitalizations due to dyspnoea, depression and fatigue which only partially recover with usual care after discharge, may brewing the risk of short-term hospital re-admission [2,3]. According to WHO, India and China constitute 2/3<sup>rd</sup> of the global mortality attributed to COPD, which is nearly 90% of COPD-related deaths occur in low and middle income countries may be responsible for tremendous costs to patients [4-7].

Although it has been cited that rehabilitation is more cost-effective as compared to routine services like out-patient clinics, emergency and critical care/intensive care unit (ICU) in hospital management [8,9]. Somehow, there is lower acceptance among medical professionals of developing countries on beneficial effects of pulmonary rehabilitation programs during clinical practice due to lack of awareness and exposure of its concepts. Moreover misconception, misrepresentations, disruption of daily routines and transportation difficulties are often reported by COPD patients are evident reasons for the debacle of this programs in this part of world [10]. Therefore, spreading awareness pertaining to pulmonary rehabilitation among health professional as well as people living with lung disease in a different way to capture their attention and motivate them to attend may be a worthwhile strategy.

There are significant studies about the benefits of pulmonary rehabilitation (PR), which shown to improvement in exercise capacity, health-related quality of life (HRQL), and work efficiency in patients with COPD. Puhan MA., *et al.* published an update of their Cochrane review entitled "Pulmonary rehabilitation following exacerbations of chronic obstructive pulmonary disease", including 20 studies, which highlighted that "Quality of life and exercise capacity were improved by rehabilitation [11]. Though financial implications in initial setting of pulmonary rehabilitation program, with recurrent expenses includes salary of personnel in rehabilitation team, maintenance of infrastructure as well as equipment must be preclude [12].

Therefore it is essential for pulmonary rehabilitation to reach the resource-poor settings, though variety of alternative low cost settings and modes of exercise training, including water-based exercise, tai chi, Integrated Approach of Yoga Therapy (IAYT), ground-based walking and community-based pulmonary rehabilitation for people with COPD are under research, Tele rehabilitation is growing in popularity and is beneficial for people who don't reside near pulmonary rehabilitation centers [13-16].

Modern information communication technologies unlock new course of action for delivering remote specialized healthcare to overcome the crisis of expertise in various PR model. Within Tele health, there are number of domains relevant to pulmonary rehabilitation,

Tele monitoring is attributed to monitoring patients at a distance where tele assistance can provide clinical care at a distance by using ICT, likewise Tele-rehabilitation (TR) provide clinical rehabilitation services at a distance [17,18]. Recent literature has depicted Telerehabilitation is as effective as supervised inpatient pulmonary rehab programs by alleviating barriers to both inpatient and home-based PR programs [19]. In a randomized control trial conducted by Tsai LL., *et al.* on 37 participants, reveal that Tele rehabilitation is an effective strategy to improve endurance exercise capacity in people with COPD [20]. Similarly, Vasilopoulou M., *et al.* conclude that ongoing home Tele-rehabilitation with the use of Tele-monitoring could significantly reduce COPD exacerbations and seems to be as beneficial as an outpatient hospital-based maintenance rehabilitation program in the context of COPD exacerbations [21]. Thus, Tele-rehabilitation may constitute a satisfactory alternative rehabilitative strategy to diminish health care costs. Zanaboni P., *et al.* conducted a comprehensive international multicentre randomized controlled trial in three countries by recruiting 120 patients with COPD, promulgate that long-term Tele-rehabilitation represents a cost-effective strategy for the follow-up of patients with COPD [22,23]. The delivery of Tele-rehabilitation services will also broaden the availability of PR and maintenance strategies, especially to those living in remote areas and with no access to centre-based exercise program. Another randomized, controlled, multicenter trial. conducted by Bernocchi P., *et al.* in 112 patients, endorse that Tele-rehabilitation was feasible and effective in older patients with combined COPD and CHF [24]. However, Damhus CS., *et al.* drag the attention toward involvement of the health professionals in the decision process combined with sufficient education and skill training for a successful implementation of TR in clinical practice [25]. Factually in the last decade, several studies have been published in, Europe (n = 18), USA (n = 4), Australia (n = 1) and China/Taiwan (n = 2) on the effects of various telemanagement programs for patients with COPD and majorities of the studies were reported that there was improvement in the quality of life, reduction in hospitalizations and patient satisfaction [26].

Therefore Tele-rehabilitation can be consider as economic as well as effective channel to overcome the crisis of inexpertly conceived rehabilitation program in developing countries due to financial constrains, it may also helpful to fill the gap in the management of COPD to rollout this facility in rural as well as remote areas of the country at lower cost.

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**Volume 9 Issue 4 April 2020**

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