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# The Efficacy of Physiotherapy Exercise Protocol Administered through Telerehabilitation in Asthma Patient: A Case Study

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**Abstract:** ***This case study strikes a timely chord in redefining asthma care for patients with limited access to conventional physiotherapy. Centered around a 54-year-old female with a complex clinical profile spanning asthma, post-angioplasty recovery, and allergic triggers the study explores how structured physiotherapy, when administered via tele-rehabilitation, can be more than just an alternative; it becomes a necessity. The tailored two-week intervention, combining breathing exercises, thoracic mobility drills, and patient education, yielded measurable gains in peak expiratory flow rate, chest expansion, and dyspnea levels. This suggests that remote rehabilitation, if thoughtfully personalized, can enhance respiratory mechanics and improve overall functional capacity. What makes this approach especially noteworthy is not just the outcome, but the modality itself flexible, accessible, and empowering for those in rural or constrained settings. It is evident that such digital physiotherapy protocols could offer a meaningful shift in asthma management, particularly by supporting patient autonomy while maintaining therapeutic efficacy. This case subtly underscores the evolving role of telemedicine in respiratory rehabilitation and opens up new conversations around scalable, holistic care strategies.***

**Keywords:** Asthma management, tele-rehabilitation, physiotherapy protocol, respiratory exercises, peak expiratory flow rate.

## 1. Introduction

Asthma is a disease characterized by reversible airway obstruction, airway inflammation, and bronchial hyper-responsiveness causing dyspnea, wheezing, chest tightness, coughing, and impaired quality of life (QoL).

It is triggered by allergens, respiratory infections, and environmental factors that necessitates developing effective management strategies.

Physiotherapy aims to reduce the frequency of asthmatic spells and the intensity of symptoms. The methods include patient education to control the symptoms, improve ventilation, control the respiratory rate and relax the breathing muscles.

Tele-rehabilitation uses telecommunications technology to provide rehabilitation services from a distance.

It makes therapy more flexible and accessible by enabling physiotherapists to evaluate, treat, and monitor patients without having to be physically present.

As a substitute for conventional in-person therapy, tele-rehabilitation has found favor among people residing in far off rural areas.

In addition, it lowers travel expenses and time while encouraging greater patient participation and self-management.

Peak Expiratory Flow Rate (PEFR) is a key indicator to assess the severity of airway obstruction and monitor asthma control. Improving PEFR is crucial in enhancing pulmonary function and reducing the frequency and severity of asthma exacerbations.

Exercises are an essential component of asthma management, aimed at improving respiratory mechanics, enhancing ventilation, and promoting airway clearance.

Thoracic expansion exercises, deep breathing exercises, diaphragmatic breathing, and posture correction can significantly improve chest wall mobility.

**Need for Study**

- Traditional physiotherapy poses challenges in accessibility, especially for patients in remote and rural areas. Tele-rehabilitation presents a promising alternative in such areas by offering real-time, remote interaction between physiotherapists and patients, enabling the continuity of care without the need for physical presence.
- Tele-rehabilitation has been adopted in various chronic conditions, including pulmonary disorders. Yet, limited research exists on the efficacy of physiotherapy protocols specifically designed for asthma patients and delivered via tele-rehabilitation. This case study aims to bridge that gap by evaluating the outcomes of a structured physiotherapy exercise protocol administered remotely.

Understanding the impact of tele-rehabilitation in asthma management is critical in assessing the effectiveness of physiotherapy and its role as a standard, non-invasive, and holistic adjunct to asthma management.

## 2. Methodology

a) **Study Duration**: 2 weeks
b) **Study type:** Case study
c) **Study population:** Patient with Asthma
d) **Case description:** A 54-year-old female patient was experiencing symptoms of breathlessness and radiating pain for 15 days. The doctor advised an angiography, which revealed 99% stenosis in the proximal LAD. She underwent angioplasty in 2017 and also presented with a diagnosis of asthma, characterized by recurring episodes of wheezing, coughing and shortness of breath.

Her symptoms worsened over the past year, significantly impacting her quality of life and daily activities. The patient medical history revealed allergies to dust, she had been prescribed inhaled corticosteroids and bronchodilators.

**Outcome Measures:** Clinical study's outcome measure were peak expiratory flow rate, Dyspnoea and chest expansion (using measuring tape)

## 3. Intervention

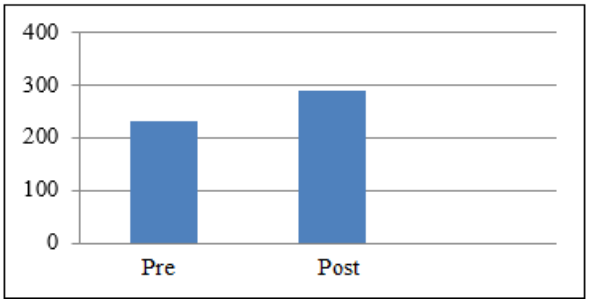
This intervention given via Tele-rehabilitation

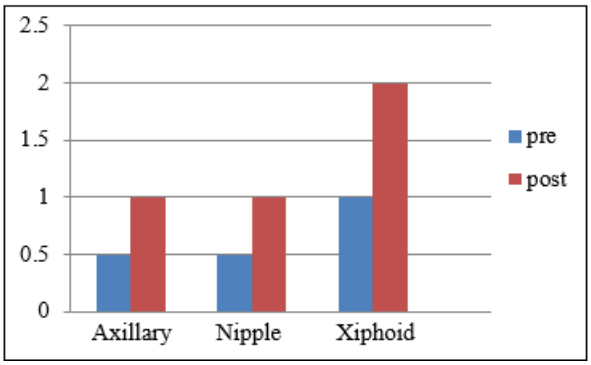
| Weeks | Technique | Dosage and progression |
|---|---|---|
| 1st week | Patient Education and awareness of Physiotherapy exercises | At the beginning of treatment protocol. |
| | Warm up exercise (Shoulder shrugs, trunk rotation, Triceps and quads stretch) | Before starting the exercises 5reps/1set |
| | Diaphragmatic breathing | 5reps/3sets |
| | Wall angels | 5reps/2sets |
| | Thread the needle breathing | 5reps/2sets |
| | Marching in place | Twice a Day for 5 minutes |
| | Cool down exercise (Side stretch, heel press, calf and hams stretch | After exercises 5reps/1sets |

| Weeks | Technique | Dosage and progression |
|---|---|---|
| 2nd week | Warm up exercise (Shoulder shrugs, trunk rotation, Triceps and quads stretch) | Before starting the exercises 5reps/1set |
| | Thoracic expansion exercise | 5reps/3sets |
| | Buteyko breathing | 3reps/3sets |
| | Wall push ups with breathing | 5reps/2sets |
| | Balloon blowing exercises | Twice a day |
| | walking | Twice a day for 5 minutes |
| | Cool down exercise (Side stretch, heel press, calf and hams stretch) | After exercises 5reps/1sets |

## 4. Results

Pre intervention values for peak cough flow were 230lt/min, chest expansion at axillary and nipple level were 0.5cm and 1cm at xiphoid level and dyspnea score according to MMRC scale was grade 3. Post 2 weeks of intervention, values for peak cough flow was 290lt/min. Expansion was 1cm at axillary and nipple level and 2cm at xiphoid level, and dyspnea score is grade 1.




## 5. Discussion

This case study evaluated the effectiveness of a structured individualized exercise protocol delivered via Tele-rehabilitation in the management of an asthma patient. The results suggest that Tele-rehabilitation can be a viable and effective method for delivering physiotherapy interventions to asthma patients, particularly in improving exercise tolerance, respiratory function, and overall quality of life.

In this study, a protocol made up of various physiotherapy exercises was given to patient which showed a improvement in overall functional capacity as well as reduction in dyspnea, which focuses on the patient's problem list and physiotherapists goals in the prognosis.

The unique aspect of this case lies in the use of a remote, digital platform to deliver these interventions, which offers flexibility and accessibility, especially for patients with limitations in attending in-person sessions.

Individually tailored physiotherapy protocols are highly beneficial for patients with asthma because they allow for interventions that address the unique causes, severity, and individual responses to the condition. Personalized physiotherapy protocols can help in promoting chest expansion, reduce dyspnea and improving overall respiratory function.

## 6. Conclusion

This study concluded that a structured individualised physiotherapy protocol delivered remotely through tele-rehabilitation is effective in reducing Dyspnea and Improving functional Capacity in asthma patient.

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