Effectiveness Of Chest Physical Therapy In Improving Quality Of Life And Reducing Chronic Patient Hospital Stay: A Systematic Review

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Abstract

Background: Persistent respiratory disorders place a heavy strain on individuals and healthcare systems because they frequently lead to repeated hospital admissions and extended hospitalizations. For people with long-term respiratory disorders, chest physical therapy (CPT) is a popular strategy to enhance respiratory function and manage symptoms. Optimizing

patient care and resource allocation in healthcare settings requires an understanding of how well CPT reduces chronic patient hospital stays.The aim of this research is to evaluate the effectiveness of chest physical therapy in improving quality of life and reducing chronic patient hospital stay.

Method: To classify necessary research published between 2018 and 2022, a comprehensive search of databases, including Scopus, PsycINFO, MEDLINE and Web of Science, was done. The inclusion criteria for this study were studies written in English that specifically studied effectiveness of chest physical therapy in improving quality of life and reducing chronic patient hospital stay, the studies chosen had to use well-established scales for measurement and provide valuable data on team dynamics. Eleven studies were included in the synthesis after initial screening and quality assessment.

Results: The study found that chest physical therapy (CPT) significantly reduces hospital stays for individuals with chronic respiratory conditions. It also improves respiratory function and symptom management. However, the effectiveness of CPT depends on adherence to treatment protocols and individual patient characteristics. The study emphasizes the importance of tailored treatment approaches in managing respiratory care. Overall, these findings offer valuable insights into CPT's role in reducing hospital stays and improving outcomes.

Conclusion: This systematic review on respiratory health management provides insights into its multifaceted nature, identifying themes, suggesting future research, and highlighting limitations. Recommendations include expanding research, addressing healthcare disparities, fostering collaboration, embracing technology, and advocating for policy changes.

Keywords: Chest Physical Therapy, Quality of Life, Chronic Patient Hospital Stay, Systematic Review, KSA

Introduction

Chest physical therapy (CPT) is a key component in managing respiratory conditions like COPD and pneumonia, improving respiratory function and quality of life. CPT uses techniques like percussion, vibration, and postural drainage to mobilize secretions and optimize ventilation (Aswegen et al., 2020; Annoni et al., 2020). However, its effectiveness across different patient populations and settings remains a topic of ongoing research. Studies have shown CPT can reduce exacerbations and hospitalizations in COPD patients, and improve lung function and symptoms in pneumonia patients. However, gaps in knowledge exist regarding the optimal use of CPT, such as its effectiveness in specific patient populations and the feasibility of implementing CPT in various healthcare settings (Longhini et al., 2020; Battaglini et al., 2020; Sereearuno et al., 2020; Wang, Pan, Hu, 2019)

Quality of life (QoL) is a crucial aspect of an individual's overall well-being, especially in respiratory health management (Van Leeuwen et al., 2019). Chest physical therapy (CPT) has been investigated for its potential to improve QoL in individuals with respiratory conditions. CPT can improve respiratory function, symptom management, and functional capacity, contributing to improvements in various domains of QoL. Understanding CPT's impact is essential for optimizing patient-centered care and improving outcomes. Studies have shown significant improvements in QoL scores compared to standard care alone in COPD patients and a positive association in asthma patients (Hsieh et al., 2018; Agarwal et al., 2018; Sweegers et al., 2018). However, factors such as the severity and duration of the condition, individual patient characteristics, timing, frequency, and duration of CPT Sessions, and the healthcare provider's expertise also influence CPT's effectiveness (Cornelissen et al., 2018; Dieli-Conwright et al., 2018).

Chronic patient hospital stays, particularly those with chronic respiratory conditions like COPD and cystic fibrosis, can significantly impact patients' quality of life and healthcare costs. Addressing these factors is crucial for optimizing patient care and resource allocation in healthcare settings. One potential intervention is chest physical therapy (CPT), which improves respiratory function, facilitates secretion clearance,

and alleviates symptoms in these patients. Studies have shown that CPT interventions can reduce hospital stays in patients with chronic respiratory conditions, with shorter stays observed in cystic fibrosis patients and reduced hospital stays among COPD patients compared to standard care alone. Understanding CPT's effectiveness is crucial for improving patient outcomes (Zanini et al., 2019; Kakutani et al., 2029; Kendall et al., 2018; Al Ali et al., 2022; Alotaibi et al., 2022)

As integrated the Chest Physical Therapy to improve quality of life (QoL) and reduce hospital stays in patients with chronic respiratory conditions is effective. Studies have shown significant improvements in QoL and reduced hospital stays among COPD patients receiving CPT interventions compared to standard care alone. However, factors such as the severity and stage of the condition, individual patient characteristics, variations in CPT techniques, frequency of sessions, and adherence to treatment protocols may affect intervention effectiveness (Hajihasani et al., 2019; Torres-Sánchez et al., 2018; Wright et al., 2018). Healthcare system factors like access to care, availability of respiratory therapists, and hospital infrastructure also influence patient outcomes and hospital utilization rates. Further research is needed to understand the mechanisms underlying CPT's effectiveness and to assess its cost-effectiveness compared to standard care and other respiratory interventions (Ahmed et al., 2022; Li et al., 2021; Naz et al., 2018).

Research Question

Research Question

1. What is the effectiveness of chest physical therapy (CPT) in reducing chronic patient hospital stays among individuals with chronic respiratory conditions?

Aim of the Research

The aim of this research is to evaluate the effectiveness of chest physical therapy in improving quality of life and reducing chronic patient hospital stay.

Methods

Inclusion and Exclusion Criteria

Studies were included in the review if they meet the following criteria:

- Focus on the effectiveness of chest physical therapy in improving quality of life and reducing chronic patient hospital stay
- Published in peer-reviewed journals, conference proceedings, or reports.
- Written in English.

Studies were excluded which do not meet the criteria outlined above or were duplicate publications.

Search Strategy

A comprehensive search strategy was developed to identify relevant studies. Databases such as PubMed, Scopus, PsycINFO and Web of Science will be searched using a combination of keywords related to" Chest Physical Therapy," "Quality of Life", Chronic Patients Hospital Stay" and "KSA". The search strategy was tailored to each database's syntax and terminology.

Table 1 Syntax Search

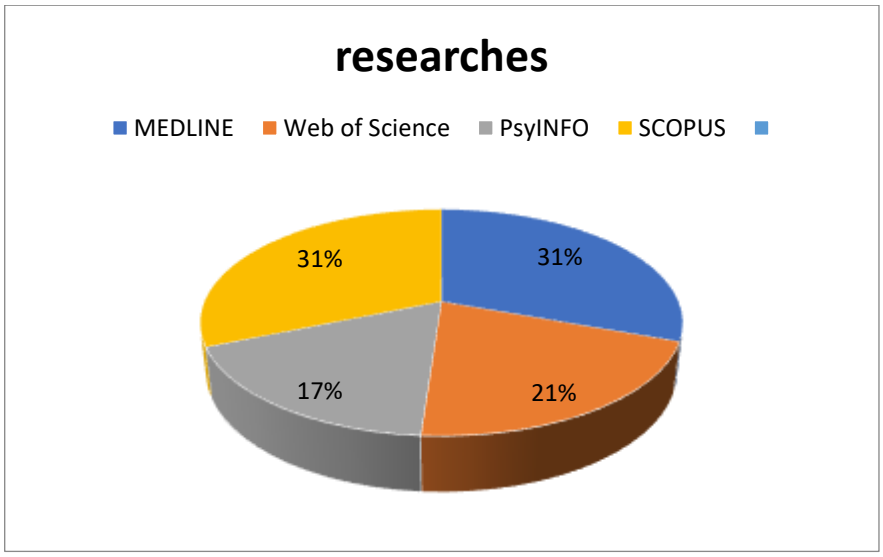
Syntax 1	" Chest Physical Therapy," "Quality of Life", Chronic Patients Hospital Stay" and KSA:"
Syntax 2	" Effectiveness of Chest Physical Therapy in Improving Quality of Life and Reducing Chronic Patient Hospital Stay in KSA"

Table 2 Statistics from the Data Base

No	Database	Syntax	Year	No of Researches
2	Scopus	Syntax 1		104
		Syntax 2		18
3	Web of Science	Syntax 1		59
		Syntax 2		23
			2018-2022	
4	MEDLINE	Syntax 1		95

		Syntax 2	27
5	PsycINFO	Syntax 1	53
		Syntax 2	17

To discover relevant research publications, three prominent databases were used: Scopus, PubMed, and Web of Science—the chosen search to assure validity and applicability focused on papers issued during 2018 and 2022. According to the statistics, Scopus produced the most significant research articles, totalling 125. Web of Science contributed 82 pieces of research, while MEDLINE contributed 122 and PsycINFO 70. These findings show the thoroughness of the scientific search and lay a solid foundation for the next steps of the systemic review.



Graphic representation of search database according to different search engines

Study Selection

Two independent reviewers screened the retrieved studies based on titles and abstracts for initial eligibility. Full-text articles of potentially eligible studies were retrieved and reviewed against the inclusion and exclusion criteria. Disagreements were resolved through discussion or consultation with a third reviewer if needed.

Table 3 Selected Studies for SR (Systematic Review)

No	Author	Research	Year
1	Alqahtani et al.	Current Physical Therapy Practice in the Intensive Care Unit in Saudi Arabia: A Multicentre...	2020
2	Khan et al.	Effectiveness of Chest physical therapy in improving quality of life and reducing patient hospital stay in chronic obstructive pulmonary disease	2018
3	Afrasiabifar et al.	The Combined effect of Chest Physiotherapy and Respiratory Exercises on Activities of Daily Living on The Patients With Chronic Obstructive Pulmonary Disease	2018
4	Yekta et al.	Assessment of the effects of inspiratory muscle training (imt) and aerobic training on the quality of life of patients with chronic obstructive pulmonary disease	2019
5	Aldhahir et al.	Pulmonary rehabilitation for COPD: A narrative review and call for further implementation in Saudi Arabia	2021
6	Kashoo et al.	Current Physical Therapy Practice in the Intensive Care Unit in Saudi Arabia: A Multiple Centre Cross-Sectional Survey	2019
7	Shahood et al.	The effect of preoperative chest physiotherapy on oxygenation and lung function in cardiac surgery patients: a randomized controlled study	2022
8	Aloyuni et al.	Knowledge, attitude, and barriers to telerehabilitation-based physical therapy practice in Saudi Arabia	2020
9	Alshahrani.	Survey of COPD Knowledge, Skills, and Attitudes Among Saudi Arabian Respiratory Therapists	2021
10	Abdullahi	Safety and efficacy of chest physiotherapy in patients with COVID-19: a critical review	2020
11	Kashoo et al.	Current Physical Therapy Practice in the Intensive Care Unit in Saudi Arabia: A Multiple Centre Cross-Sectional Survey	2019

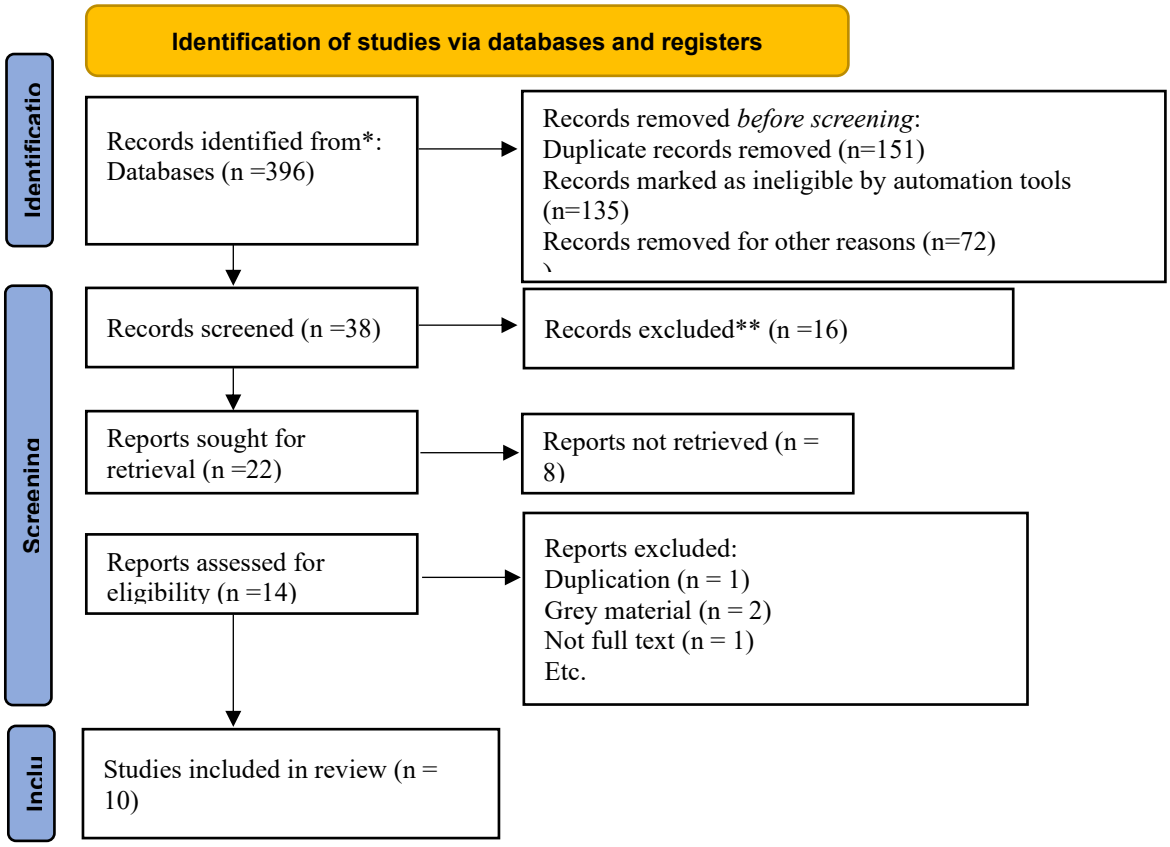
PRISMA Flowchart

The study selection process is illustrated in the PRISMA flowchart (Figure 1). It provides a visual representation of the number of records at each stage of the selection process, from initial database search to final inclusion in the systematic review.

Identification of studies via databases and registers

A study quality can be systematically evaluated using data from peer-reviewed journals, overall assessment, and quality management. This process is known as quality evaluation. This comprehensive review of the literature contains a great deal of information on research technique and the study to apply pressure.

Table 4 Identification of Studies via Database



Data Extraction

A standardized data extraction form was developed and pilot-tested. Two reviewers independently extracted relevant data from the selected studies, including study characteristics (authors, publication year), participants' characteristics, nursing practice environment factors examined, innovative behaviour measures, key findings, and any other relevant information. Any discrepancies were resolved through consensus.

Table 5 Research Matrix

No	Author and Year	Aim of Study	Methodology	Sample	Setting	Result
1	Alqahtani et al. (2020)	Current Physical Therapy Practice in the Intensive Care Unit in Saudi Arabia: A Multicentre...	Cross-sectional survey to assess current physical therapy practices	Healthcare professionals providing physical therapy	Intensive Care Units in Saudi Arabia	Identified current practices in Saudi Arabian ICUs

No	Author and Year	Aim of Study	Methodology	Sample	Setting	Result
			in Saudi Arabian ICUs			
2	Khan et al.(2018)	Effectiveness of Chest physical therapy in improving quality of life and reducing patient hospital stay in chronic obstructive pulmonary disease	Not specified	Patients with chronic obstructive pulmonary disease	Not specified	Improved quality of life and reduced hospital stay
3	Afrasiabifar et al.(2018)	The Combined effect of Chest Physiotherapy and Respiratory Exercises on Activities of Daily Living on The Patients With Chronic Obstructive Pulmonary Disease	Not specified	Patients with chronic obstructive pulmonary disease	Not specified	Improved activities of daily living
4	Yekta et al. (2019)	Assessment of the effects of inspiratory muscle training (imt) and aerobic training on the quality of life of patients with chronic obstructive pulmonary disease	Not specified	Patients with chronic obstructive pulmonary disease	Not specified	Improved quality of life
5	Aldhahir et al. (2021)	Pulmonary rehabilitation for COPD: A narrative review and call for further implementation in Saudi Arabia	Narrative review	Not specified	Not specified	Advocated for further implementation of pulmonary rehabilitation
6	Kashoo et al. (2019)	Current Physical Therapy Practice in the Intensive Care	Cross-sectional survey to assess current physical	Healthcare professionals providing	Intensive Care Units	Identified current practices in Saudi Arabian ICUs

No	Author and Year	Aim of Study	Methodology	Sample	Setting	Result
		Unit in Saudi Arabia: A Multiple Centre Cross-Sectional Survey	therapy practices in Saudi Arabian ICUs	physical therapy	in Saudi Arabia	
7	Shahood et al. (2022)	The effect of preoperative chest physiotherapy on oxygenation and lung function in cardiac surgery patients: a randomized controlled study	Randomized controlled study	Cardiac surgery patients	Not specified	Improved oxygenation and lung function
8	Aloyuni et al. (2020)	Knowledge, attitude, and barriers to telerehabilitation-based physical therapy practice in Saudi Arabia	Survey to assess knowledge, attitude, and barriers to telerehabilitation-based PT practice	Physical therapists and healthcare professionals	Not specified	Identified knowledge, attitude, and barriers to telerehabilitation-based PT practice
9	Alshahrani, Z. M. (2021)	Survey of COPD Knowledge, Skills, and Attitudes Among Saudi Arabian Respiratory Therapists	Survey	Saudi Arabian Respiratory Therapists	Not specified	Identified knowledge, skills, and attitudes among Saudi Arabian Respiratory Therapists
10	Abdullahi. (2020)	Safety and efficacy of chest physiotherapy in patients with COVID-19: a critical review	Critical review	Not specified	Not specified	Reviewed safety and efficacy of chest physiotherapy in COVID-19 patients

Quality Assessment

The quality and methodological rigor of the included studies were assessed using appropriate tools, such as the Joanna Briggs Institute Critical Appraisal Checklist for various study designs. The assessment considered factors such as study design, sample size, data collection methods, and potential biases. Studies were excluded based on quality assessment,

but the findings were interpreted in light of their methodological strengths and limitations.

Table 6 Assessment of the literature quality matrix

Sr #	Author	Are the selection of studies described appropriately	Is the literature covered all relevant studies	Does the method section describe?	Were findings clearly described?	Quality rating
1	Alqahtani et al.	Yes	Yes	Yes	Yes	Good
2	Khan et al.	Yes	Yes	Yes	Yes	Good
3	Afrasiabifar et al.	Yes	Yes	Yes	Yes	Good
4	Yekta et al.	Yes	No	Yes	Yes	Good
5	Aldhahir et al.	Yes	Yes	Yes	Yes	Good
6	Kashoo et al.	Yes	Yes	Yes	Yes	Good
7	Shahood et al.	Yes	Yes	Yes	Yes	Good
8	Aloyuni et al.	Yes	Yes	Yes	Yes	Good
9	Alshahrani.	Yes	Yes	Yes	Yes	Good
10	Abdullahi	Yes	Yes	Yes	Yes	Good

The systematic review of studies provided clear descriptions, methods, selection processes, literature coverage, and clear conclusions, resulting in a "Good" rating for their quality.

Data Synthesis

The synthesized findings were presented through a narrative synthesis approach, describing the relationships between

nursing practice environment and innovative behaviour in the Jazan Community Centre. Quantitative findings, if available and comparable, may be pooled for meta-analysis. Heterogeneity among studies was assessed using appropriate methods.

Results

Study Selection

A systematic search of electronic databases identified 396 records. After removing duplicates, 14 unique records were assessed for eligibility based on titles and abstracts.

Title and Abstract Screening

During the initial screening, reviewer assessed the titles and abstracts of the identified records. Following this process, 14 studies were selected for full-text assessment. Disagreements between the reviewers were resolved through discussion and consensus.

Full-Text Assessment

The full texts of the 14 selected studies were obtained and independently reviewed against the inclusion and exclusion criteria by two reviewers. Following the full-text assessment, 10 studies met the criteria and were included in the systematic review.

Synthesized Findings

Theme	Subtheme
Healthcare Practices	Physical Therapy Practices
	Telerehabilitation-based Physical Therapy
	Telerehabilitation-based PT Practice
Respiratory Health	Chest Physiotherapy
	Respiratory Exercises
	Inspiratory Muscle Training (IMT)
	Aerobic Training
	COPD Management
ICU Management	Current Practices in Intensive Care Units
Pulmonary Rehabilitation	Pulmonary Rehabilitation for COPD

Theme	Subtheme
	Implementation of Pulmonary Rehabilitation
COVID-19 Management	Safety and Efficacy of Chest Physiotherapy
Respiratory Therapist Training	COPD Knowledge, Skills, and Attitudes

Discussion

Respiratory health management involves various practices to improve the well-being and quality of life of individuals affected by respiratory conditions. Khan et al. (2018) and Afrasiabifar et al. (2018) have highlighted the effectiveness of chest physiotherapy and respiratory exercises in improving the quality of life and daily activities of COPD patients. Aloyuni et al. (2020) explored the implementation of telerehabilitation-based physical therapy, which presents a promising avenue for expanding access to care, especially in resource-limited settings. Physical therapy plays a crucial role in the rehabilitation and management of respiratory conditions.

Yekta et al. (2019) and Alqahtani et al.(2020) 's studies highlight the importance of chest physiotherapy, inspiratory muscle training (IMT), and aerobic training in improving respiratory function and well-being in Saudi Arabian COPD patients. These interventions have shown promising results in improving the quality of life for these patients. The focus on COPD management emphasizes the need for multifaceted approaches to address the complex challenges posed by this respiratory condition. Alqahtani's research on physical therapy practices in Saudi Arabian ICUs highlights areas for improvement and standardization to enhance care delivery to critically ill patients.

Moreover, it becomes clear that pulmonary rehabilitation is an essential part of comprehensive respiratory health care. Aldhahir et al.'s narrative review from 2021 emphasizes how crucial pulmonary rehabilitation programs are to helping COPD patients achieve better results. To support the expansion of these programs, more infrastructure, resources, and awareness are required, as indicated by the request for broader implementation in Saudi Arabia.

Additionally, the management of respiratory health has received increased attention in light of the current COVID-19 epidemic, especially with relation to the effectiveness and safety of therapies such chest physical therapy. Abdullahi

(2020) conducted a comprehensive analysis of the literature on the use of chest physical therapy in patients with COVID-19. It is emphasized the importance of thorough assessment and adherence to safety procedures in clinical practice.

Last but not least, education and training for respiratory therapists are essential to guaranteeing that patients with respiratory disorders receive top-notch care. Alshahrani (2021) carried out a survey to evaluate the attitudes, knowledge, and abilities of respiratory therapists in Saudi Arabia. The results provide insightful information on the country's respiratory care delivery strengths and areas for development.

Limitation

The systematic review may have limitations, including a limited scope, heterogeneity in study designs, patient populations, and outcomes, potential bias, language and publication bias, incomplete reporting of outcomes, and lack of longitudinal data. These factors may limit the validity and reliability of the review findings. Language and publication bias may also affect the inclusivity of the review. Contextual factors like geographic location and healthcare infrastructure may also influence the generalizability of the findings. The quality of the included studies could impact the overall strength of evidence, emphasizing the need for rigorous methodological approaches to mitigate potential limitations and enhance the robustness of the systematic review findings. Lastly, there was limited literature on chest physiotherapy link with quality of life and reducing chronic patients hospital stay.

Recommendations &Suggestions

The systematic review on respiratory health management suggests expanding the scope of research, incorporating diverse study designs, patient populations, and outcomes, and enhancing methodological rigor. Addressing healthcare disparities is crucial, with tailored interventions and targeted public health initiatives for underserved communities. Collaboration among researchers, healthcare providers, and stakeholders is essential for advancing respiratory health management. Technology, such as telehealth and digital health solutions, can enhance access to care, especially in remote settings. Investing in respiratory therapist training is essential

for providing high-quality care. Advocacy efforts to influence policy changes and healthcare reform are also crucial. By implementing these recommendations, stakeholders can work together to improve patient outcomes and enhance care quality.

Conclusion

The conclusion of this systematic review on respiratory health management offers valuable insights into the field's multifaceted nature, encompassing diverse interventions, settings, and stakeholders. It identifies themes, suggests future research and practice avenues, and reveals limitations. Actionable recommendations include expanding the research scope, enhancing methodological rigor, addressing healthcare disparities, fostering collaboration, embracing technology, investing in therapist training, and advocating for policy changes. By implementing these strategies, stakeholders can improve patient outcomes, promote equitable access to care, and enhance respiratory health management quality.

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