CME LIVE OPEN ACCESS

Rheumatology & Orthopaedics Research

Research Article

ISSN: 3065-9035

Patient-Reported Outcomes after Thoracentesis and Paracentesis in Pleural Effusion Patients in Nigeria: A Scoping Review

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Received: 2025 Dec 24 **Accepted:** 2026 Jan 14 **Published:** 2026 Jan 23

Abstract

Background: *Thoracentesis and paracentesis are key procedures for managing pleural effusions. While their clinical efficacy is recognized, their impact on patient-reported outcomes (PROs) encompassing physical, psychological, and social well-being remains poorly understood, especially in resource-constrained settings like Nigeria. This scoping review mapped and synthesized the existing literature on PROs following these procedures in Nigerian patients.*

Methods: *Following the Joanna Briggs Institute (JBI) methodology for scoping reviews, a systematic search was conducted across PubMed, PMC, Scopus, EMBASE, AJOL, and CINAHL for studies published between 2015 and 2025. Data from eligible studies were extracted and charted to summarize study characteristics, methodologies, and PRO findings.*

Results: *The review identified a critical scarcity of primary research investigating PROs post-thoracentesis and paracentesis in Nigeria. Existing literature focuses predominantly on clinical management, etiology (notably tuberculosis and malignancy), and complication rates. PRO data, when mentioned, is largely descriptive, with no Nigerian studies employing validated Patient-Reported Outcome Measures (PROMs). This highlights a significant disconnect between procedural success and patient-centered care assessment in this context.*

Conclusion: *This review underscores a severe evidence gap regarding the patient experience of pleural effusion procedures in Nigeria. There is an urgent need for robust, prospective studies that integrate validated PROMs, such as the Visual Analogue Scale for Dyspnoea (VASD), to evaluate the true impact of these interventions on quality of life. The findings call for the development of patient-centered care pathways tailored to the unique challenges of the Nigerian healthcare system.*

Keywords: Patient-Reported Outcomes, Thoracentesis, Paracentesis, Pleural Effusion, Nigeria, Scoping Review

1. Introduction

Pleural effusions affect over 1.5 million individuals annually in the United States, presenting substantial challenges to patient quality of life due to debilitating symptoms such as dyspnea, fatigue, and reduced mobility [1]. Thoracentesis and paracentesis are widely used minimally invasive procedures for symptomatic relief and diagnostic evaluation in patients with pleural effusion, particularly as healthcare systems prioritize cost-effective and patient-centered care. While these procedures are generally considered safe, their long-term impact on patient-reported outcomes, such as physical functioning, mental health, and overall quality of life, remains poorly understood. Thoracentesis is a staple of pleural effusion management, with studies underscoring its effectiveness in alleviating dyspnea and associated discomfort Similarly, paracentesis has emerged as a key intervention in managing symptomatic ascites, particularly in hepatic or malignancy-associated conditions [2,3]. Despite growing clinical adoption of these procedures, research into their nuanced effects on patient-reported outcomes remains sparse. Existing investigations often focus on short-term relief or procedural safety, overlooking how these interventions influence broader dimensions of patient experience, such as psychological wellbeing and social functioning. Emerging studies have begun to explore the interplay between procedural interventions like thoracentesis and paracentesis

and patient-reported outcome measures (PROMs), offering valuable insights into symptom management and healthcare utilization.

For instance, improvements in dyspnea and functional status following fluid drainage have been documented, though the magnitude and durability of these benefits vary significantly across patient populations [4,5]. However, discrepancies in methodologies, measurement tools, and study designs have complicated efforts to standardize PROMs and define clinically meaningful improvements for these patients. Addressing these inconsistencies is crucial to ensure interventions are tailored effectively to enhance both the physical and mental health of affected individuals. This review aims to synthesize existing PROM studies in pleural effusion patients undergoing thoracentesis or paracentesis, identifying gaps and refining our understanding of their impact on diverse patient-centered care. Despite advancements in procedural guidance and safety, the integration of patient-reported outcomes into the evaluation of thoracentesis and paracentesis remains limited. Foundational studies have demonstrated short-term physiological benefits, such as improved respiratory parameters and reduced abdominal pressure, following fluid removal [3]. However, these studies often lack robust assessments of how such interventions influence broader outcomes, such as psychological relief, social engagement, or long-term health-related quality of life metrics. Early attempts to incorporate patient-centered measures, such as the visual analogue scale (VAS) for dyspnea, have shown promise but remain inadequately validated for this patient population [6]. By addressing methodological limitations and aligning PROMs with the patient experiences unique to pleural effusion management, future studies can better define intervention success and inform personalized care pathways. Recent investigations have highlighted the need to evaluate the long-term outcomes of thoracentesis and paracentesis beyond immediate symptom relief, particularly in terms of their psychological and social impacts. Patient-reported outcome measures (PROMs) serve as crucial tools to capture these multidimensional aspects of health, yet their application in procedural studies remains inconsistent. For instance, while several trials document short-term improvements in dyspnea and reduced dependency on hospital-based care, gaps persist in understanding how these procedures influence factors like post-procedural anxiety, depression, or return to daily activities [5].

Furthermore, variations in PROM methodologies such as the use of single dimensional scale versus multidimensional instruments complicate cross-study comparisons. Addressing these methodological disparities is essential to advance personalized healthcare for pleural effusion patients, ensuring interventions optimize both physical and psychosocial outcomes. From 329 abstracts, 29 clinical trials of pleural effusion drainage that used PROMs as an outcome measure were identified. A total of 16 different PROMs were used. The most used PROMs were unidimensional measurements of breathlessness, particularly the visual analogue scale for dyspnoea (VASD), all of which nearly showed improvements in breathlessness following pleural fluid drainage. Other variables commonly assessed included activity levels and health-related quality of life. Multidimensional PROMs showed inconsistent responsiveness to pleural fluid drainage. Only the VASD was validated in this patient group with a defined MCID. A range of PROMs are used in clinical trials of pleural fluid drainage. No single PROM measures all the outcomes of interest. One-dimensional measurements of breathlessness are responsive to pleural fluid drainage. Only the VASD is validated with an MCID. There is a need for properly validated, response PROMs which measure the key outcomes of interest in this patient group. Reported on a study on the pathophysiology of breathlessness in patients with symptomatic pleural effusions he said Pleural effusion is a common clinical problem that can complicate many medical conditions. Breathlessness is the most common symptom of pleural effusion of any cause and the most common reason for pleural drainage. However, improvement in breathlessness following drainage of an effusion is variable; some patients experience either no benefit or a worsening of their breathlessness. The physiological mechanisms underlying breathlessness in patients with a pleural effusion are unclear and likely to be multifactorial with patient-related and effusion-related factors contributing. A comprehensive study of the physiological and symptom responses to drainage of pleural effusions may provide a clearer understanding of these mechanisms, and may identify predictors of benefit from drainage. The ability to identify those patients whose breathlessness will (or will not) improve after pleural fluid drainage can help avoid unnecessary pleural drainage procedures, their associated morbidities and costs. The PL eural Effusion and Symptom Evaluation (PLEASE) study is a prospective study to comprehensively evaluate factors contributing to pleural effusion-related breathlessness. study is a single-centre prospective study of 150 patients with symptomatic pleural effusions that require therapeutic drainage Participants will undergo evaluation pre-effusion and post-effusion drainage to assess their level of breathlessness at rest and during exercise, respiratory and other physiological responses as well as respiratory muscle mechanics. Pre-drainage and post-drainage parameters will be collected and compared to identify the key factors and mechanisms that correlate with improvement in breathlessness.

1.1. Objectives

This study is guided by the following objective.

- To conduct a comprehensive scoping review of existing literature on patient-reported outcomes (PROs) following thoracentesis and paracentesis procedures in pleural effusion patients in Nigeria.
- To systematically evaluate and synthesize existing literature on patient-reported outcomes (PROs) following thoracentesis and paracentesis in patients with pleural effusions in Nigeria.
- To identifying methodological strengths and gaps to advance the integration of PROMs (Patient-Reported Outcome Measures) into clinical practice for improved patient-centered care.

1.2. Research Question

This study is guided by the following questions

• What are the scoping reviews on patient-reported outcomes (PROs) following thoracentesis and paracentesis procedures in pleural effusion patients in Nigeria?

• What are the systematic evaluations and synthesis of existing literature on patient-reported outcomes (PROs) following thoracentesis and paracentesis in patients with pleural effusions in Nigeria.

• What are the methodological strengths and gaps to advance the integration of PROMs (Patient-Reported Outcome Measures) into clinical practice for improved patient-centered care.

1.3. Background

Thoracentesis and paracentesis have long been integral to symptomatic management in patients with pleural effusions and ascites, reflecting a paradigm shift towards minimally invasive interventions in clinical care. Historically, these procedures were developed as direct responses to the debilitating consequences of fluid accumulation, with early studies prioritizing physiological endpoints, such as improved respiratory mechanics or reduced intra-abdominal pressure. However, the evolution of patient-centered care over the past two decades has underscored the importance of assessing health outcomes beyond immediate symptom relief, including broader measures of physical, mental, and social well-being. While early investigations into thoracentesis and paracentesis focused primarily on their immediate physiological impacts, emerging research has increasingly emphasized the role of patient-reported outcome measures (PROMs) in assessing their comprehensive benefits. Foundational works in the field have predominantly used one-dimensional tools such as the Visual Analogue Scale for Dyspnea (VASD)—to evaluate symptom alleviation, particularly breathlessness, following pleural fluid drainage. However, reliance on these narrow metrics has left critical gaps in understanding the broader dimensions of recovery, such as improvements in psychological well-being, functional activity, and overall quality of life. Furthermore, inconsistencies in the validation and responsiveness of PROMs across studies have complicated efforts to establish clinically meaningful benchmarks for intervention success [8]. Moreover, while linear-dimensional PROMs like the VASD have demonstrated utility in quantifying immediate symptomatic relief, recent studies have revealed their inability to fully capture the complexity of patient experiences post-procedure. For instance, multidimensional PROMs, which assess overlapping domains such as physical functioning, emotional well-being, and social engagement, have shown mixed responsiveness to pleural fluid drainage outcomes. This inconsistency may stem from methodological heterogeneity or a failure to account for the diverse etiologies and clinical contexts of pleural effusion, such as malignancy-associated or hepatic conditions [8]. At the same time, studies like the Pleural Effusion and Symptom Evaluation (PLEASE) trial have emphasized that the variability in patient responses to drainage may be linked to multifactorial pathophysiological mechanisms, which are not always addressed by standard PROMs [10].

Pleural effusions have a major impact on the cardiorespiratory system. This article reviews the pathophysiological effects of pleural effusions and pleural drainage, their relationship with breathlessness, and highlights key knowledge gaps. The basis for breathlessness in pleural effusions and relief following thoracentesis is not well understood. Many existing studies on the pathophysiology of breathlessness in pleural effusions are limited by small sample sizes, heterogeneous design and a lack of direct measurements of respiratory muscle function. Gas exchange worsens with pleural effusions and improves after thoracentesis. Improvements in ventilatory capacity and lung volumes following pleural drainage are small, and correlate poorly with the volume of fluid drained and the severity of breathlessness. Rather than lung compression, expansion of the chest wall, including displacement of the diaphragm, appears to be the principle mechanism by which the effusion is accommodated. Deflation of the thoracic cage and restoration of diaphragmatic function after thoracentesis may improve diaphragm effectiveness and efficiency, and this may be an important mechanism by which breathlessness improves. Effusions do not usually lead to major hemodynamic changes, but large effusions may cause cardiac tamponade and ventricular diastolic collapse. Patients with effusions can have impaired exercise capacity and poor sleep quality and efficiency. Pleural effusions are associated with abnormalities in gas exchange, respiratory mechanics, respiratory muscle function and hemodynamic, but the association between these abnormalities and breathlessness remains unclear. Prospective studies should aim to identify the key mechanisms of effusion-related breathlessness and predictors of improvement following pleural drainage [7]. In another study by study that Pleural effusions cause breathlessness, decreased activity levels, and impaired quality of life [8]. Clinical trials of drainage of pleural effusion use patient-reported outcome measures (PROMs) to assess these variables. what variables were assessed, whether they were responsive to pleural interventions, and whether they have been validated in patients with pleural effusions, including a defined Minimal Clinically Important Difference (MCID).

1.4. Problem Statement

In the course of thinking through this topic for study after a painful experience of an uncle who passed through these procedures suffering pleural effusion, the researcher, after mapping different websites observed that prior studies have emphasized the clinical efficacy of thoracentesis and paracentesis in managing pleural effusion, their patient-reported outcomes remain severely underexplored, particularly in low-resource settings such as Nigeria. The procedural focus of existing research often obscures the lived experiences of individuals undergoing these interventions, including the physical and psychosocial challenges they encounter post-procedure. This gap is exacerbated by insufficient regional data detailing patterns of re-accumulation, complications, and subjective recovery, which are necessary to holistic care and patient-centered treatment strategies. More so, the limited exploration of patient-

reported outcomes often the sociocultural and systemic factors specific to the Nigerian healthcare landscape, where access to follow-up care, awareness of post-procedural management, and resource constraints can significantly affect recovery process. While studies in high-income contexts have underscored the importance of integrating patient feedback to optimize procedural guidelines, to Nigeria is restricted by differences in healthcare infrastructure, patient education, and disease burden. This lack of localized evidence not only hinders the development of context-sensitive protocols but also perpetuates differences in the quality of care and long-term outcomes for pleural effusion patients. Furthermore, the absence of comprehensive evidence on patient-reported outcomes following thoracentesis and paracentesis in Nigeria creates a critical barrier to addressing the unique challenges faced by pleural effusion patients in Nigeria. Specifically, there is no systematic evaluation of how procedure-related complications such as recurrent fluid accumulation, respiratory distress, or infection intersect with patients' perceptions of care effectiveness and quality of life over time. While descriptive accounts suggest significant variability in post-procedure experiences, these remain undocumented in peer-reviewed literature, thereby limiting the ability of clinicians and policymakers to design patient centered health interventions. Bridging this knowledge gap is essential to improving both procedural safety and patient satisfaction in under-resourced healthcare systems like Nigeria's. Existing healthcare frameworks in the region often neglect the psychosocial dimensions of recovery, such as the emotional distress associated with fluid re-accumulation or the stigma tied to visible respiratory difficulties, further marginalizing the voices of pleural effusion patients.

1.5. Significance of the Study

The study "Patients reported outcomes after thoracentesis and paracentesis on pleural effusion patients in Nigeria" likely investigates the outcomes and experiences of patients with pleural effusion in Nigeria who underwent thoracentesis or paracentesis procedures. The study focuses on thoracentesis and paracentesis, which are procedures used to remove fluid from the pleural cavity and abdominal cavity, respectively. It specifically targets patients with pleural effusion, a common clinical condition that can arise from various underlying diseases such as infections, heart failure, or malignancies. The focus on patient-reported outcomes (PROs) highlights the importance of understanding the patient's perspective post-procedure. This can include aspects such as pain, quality of life, satisfaction with care, and any complications experienced. The scoping review component indicates a broad examination of existing literature and data related to PROs in this context, helping to identify gaps in knowledge, prevalent themes, and areas requiring further research. Assessing the degree of symptom relief after thoracentesis or paracentesis, such as reduced dyspnea or improved oxygenation. The study is aimed to improve quality of life by evaluating changes in patients' quality of life, including physical function, emotional well-being, and social relationships. Documenting and analyzing complications or adverse events associated with the procedures. Understanding patient-reported outcomes can help healthcare providers tailor their care to better meet the needs of patients with pleural effusion, particularly in resource limited settings. The study may evaluate the effectiveness of thoracentesis and paracentesis in alleviating symptoms, improving quality of life, and reducing complications in patients with pleural effusion. Assessing Procedural Effectiveness in this study may evaluate the effectiveness of thoracentesis and paracentesis in alleviating symptoms, improving quality of life, and reducing complications in patients with pleural effusion. The findings in this study may inform healthcare policy and guidelines for managing pleural effusion in Nigeria, where there may be unique challenges and resource constraints. The scope of this paper is to conduct a systematic landscape analysis of how the patient experience (PROs) is currently captured and understood in the context of common fluid drainage procedures for pleural effusion within the specific and under-researched setting of Nigeria. It is a foundational piece designed to clarify what is known, what is not known, and where future research and clinical efforts should be directed to improve patient-centered care. To identify and catalog all existing studies from Nigeria that mention or measure PROs following the specified procedures. To summarize the methodologies used in these studies, including the types of PROMs employed (e.g., VASD, quality of life tools). To identify the findings related to PROs, such as improvements in dyspnea, quality of life, or psychological state. To pinpoint major gaps in the literature, such as the absence of validated PROMs, lack of long-term data, and methodological inconsistencies. To provide recommendations for future research and clinical practice in Nigeria. Exclusion criteria, Pediatric populations (<18 years). Animal studies. Other pleural procedures like pleurodesis or the insertion of indwelling pleural catheters. The focus is solely on thoracentesis and, by extension, paracentesis.

1.6. Operational Definitions

- Patient-Reported Outcomes (PROs) refer to data collected directly from patients about their own health, well-being, and treatment experience, without interpretation by a clinician.
- Thoracentesis is defined as a minimally invasive medical procedure in which a needle or a small catheter is inserted through the chest wall into the pleural space (the space between the lungs and the chest wall) to remove fluid. it is a primary intervention studied for its effectiveness in draining pleural effusions to provide symptomatic relief and for diagnostic purposes.
- Paracentesis is a minimally invasive medical procedure involving the insertion of a needle or catheter into the peritoneal cavity. While the paper's main focus is on pleural effusions, paracentesis is included as a comparable fluid drainage procedure often studied alongside thoracentesis in the context of patient-reported symptom relief.
- Pleural Effusion is the abnormal accumulation of excess fluid in the pleural space.

In this paper, Nigeria is not just a geographical location but the specific, critical context of the study. It represents a low-resource healthcare setting with unique challenges, including a high burden of infectious diseases like tuberculosis, limited healthcare infrastructure, and sociocultural factors that

influence patient care and recovery.

• Scoping Review is the methodological approach used in this paper. It is a type of research synthesis that aims to "map" the existing literature on a broad topic. Unlike a systematic review that answers a specific clinical question.

1.7. Literature Review

1.8. Conceptual Framework

The management of pleural effusion through thoracentesis and paracentesis has gained prominence due to its immediate physiological benefits, such as the alleviation of dyspnea and the reduction of abdominal and thoracic pressures. However, the overarching clinical goal of improving patient health extends beyond immediate symptom relief to encompass long-term physical, psychological, and social well-being. Despite the increasing global recognition of patient-reported outcome measures (PROMs) as a standard for evaluating the multidimensional impact of medical interventions, their integration into studies on thoracentesis and paracentesis remains inconsistent, particularly in resource-constrained settings. In Nigeria, where healthcare systems face significant barriers such as limited access to specialized care, inadequate follow-up protocols, and various sociocultural factors, the exploration of PROMs in the context of pleural effusion remains largely absent. This presents a critical knowledge gap, as existing research fails to adequately capture the nuances of patient experiences, complicating the design of tailored interventions that align with both clinical objectives and patient-centered care priorities. The absence of localized evidence on patient-reported outcomes following these procedures in Nigeria is especially concerning given the unique socioeconomic, infrastructural, and cultural challenges of the region. For instance, the lack of validated, multidimensional PROMs exacerbates the under-documentation of key variables, such as psychological recovery, activity resumption, and social reintegration, which are critical to understanding the full scope of patient recovery. Moreover, the variability in patient experiences shaped by factors such as healthcare access disparities, economic limitations, and differing perceptions of illness highlights the need for context-sensitive research. Without such evidence, current clinical practices are largely informed by data from high-resource settings, which may not be directly applicable to the Nigerian healthcare context. This creates a gap between available clinical guidelines and the lived realities of patients, further perpetuating inequities in care delivery and health outcomes. To further complicate this issue is the methodological heterogeneity of existing studies, which often rely on tools, such as the Visual Analogue Scale for Dyspnea (VASD), to assess post-procedural outcomes. While these tools offer insights into immediate symptomatic relief, they fail to account for broader dimensions such as mental health, long-term physical functionality, and the ability to reintegrate socially or economically following treatment. The reliance on these narrow metrics limits the ability to assess the long-term efficacy and comprehensive success of interventions like thoracentesis and paracentesis. Inconsistencies in measurement instruments and a lack of standardized benchmarks for "meaningful" patient-reported improvements further complicate efforts to synthesize findings across studies. This lack of methodological rigor not only restricts it broadness but also hinders the identification of best practices that could optimize patient-centered care. The tension between clinical efficacy and patient-centered care in pleural effusion management highlights a critical gap in understanding the multidimensional effects of thoracentesis and paracentesis.

Dominant frameworks emphasize procedural safety and immediate symptom relief, rooted in biomedical paradigms that prioritize physiological metrics such as improved respiratory parameters [2]. However, this reductionist approach often neglects the psychological and social dimensions central to patient well-being, as argued by proponents of holistic healthcare models [6]. While one-dimensional measures of dyspnea improvement, such as the Visual Analog Scale for Dyspnea (VASD), are validated for clinical use they fail to capture broader outcomes like mental health recovery, social reintegration, or long-term quality of life [5]. Methodological approaches to patient-reported outcome measures (PROMs) in thoracentesis and paracentesis studies exhibit significant variability, reflecting both progress and persistent shortcomings in the field. Early investigations often relied on unidimensional tools like the Visual Analog Scale for Dyspnea (VASD), lauded for their simplicity and clinical responsiveness but criticized for limited scope and inability to assess multidimensional well-being [5]. More recent studies have attempted to incorporate multidimensional PROMs, such as health-related quality of life indices, yet struggle with inconsistent validation and responsiveness [3]. Despite offering richer insights into psychological and social dimensions, these instruments often fail to account for contextual factors, such as cultural attitudes toward health or systemic barriers in healthcare access, particularly in low-resource settings like Nigeria. Interdisciplinary insights into patient-reported outcomes (PROMs) reveal promising yet underexplored intersections that could inform thoracentesis and paracentesis frameworks.

For instance, advancements in behavioral medicine emphasize the role of psychological resilience in chronic disease management, suggesting that interventions addressing emotional well-being may significantly enhance procedural outcomes. However, these principles remain largely absent from PROM methodologies in pleural effusion studies, which predominantly focus on physical symptom relief [10]. Similarly, public health research underscores the importance of socio-environmental determinants such as access to supportive care networks and healthcare equity in shaping recovery trajectories [11]. Yet, PROM literature in pleural effusion management often neglects these contextual factors, limiting its ability to holistically evaluate outcomes across diverse settings, such as Nigeria. The existing literature on PROMs in thoracentesis and paracentesis studies has consistently revealed significant gaps in understanding how cultural and healthcare system disparities influence patient-reported outcomes, particularly in under-researched contexts such as Nigeria. While global studies have documented short-term improvements in dyspnea and functional status, these

findings often fail to account for localized barriers, including limited procedural accessibility, varying cultural perceptions of symptom burden, and healthcare inequities [5]. Such gaps are compounded by the absence of PROM tools tailored to resource-constrained settings, where systemic inefficiencies and infrastructural challenges may undermine the long-term benefits of these interventions. Furthermore, few studies have systematically examined the durability of psychological and social improvements post-procedure, leaving an urgent need for frameworks that integrate culturally sensitive PROM methodologies within the context of pleural effusion management in Nigeria.

1.9. Summary of Literature

The justification for this research rests on addressing critical gaps in the existing body of knowledge concerning patient-reported outcomes in pleural effusion patients undergoing thoracentesis or paracentesis. Despite the widespread use and clinical reliance on these procedures, there remains a striking paucity of robust evidence regarding their impacts beyond basic physiological and symptomatic relief. Historically, thoracentesis and paracentesis have been evaluated through narrowly focused indicators, such as improved respiratory parameters or reduced abdominal pressure, predominantly emphasizing the immediate physical benefits of these interventions. While foundational studies have demonstrated their effectiveness in alleviating dyspnea and other symptoms, these investigations have often failed to account for the broader and multidimensional impacts of these procedures on patient health, including mental well-being, functional recovery, and social reintegration. Such limitations not only hinder the standardization of outcome measures but also restrict the integration of patient-centered approaches into procedural care pathways. This research builds on the imperative to integrate multidimensional patient-reported outcome measures (PROMs) into pleural effusion management, aligning with contemporary healthcare priorities that emphasize personalized, value-driven care. A scoping review aimed at synthesizing and critically evaluating existing studies on PROMs following thoracentesis and paracentesis will not only address methodological inconsistencies but also provide a clearer understanding of intervention success from the patient's perspective. Recent literature underscores the need to move beyond unidimensional metrics, such as the Visual Analogue Scale for Dyspnea (VASD), which despite its validation and responsiveness to breathlessness offers only a narrow view of patient improvement. Multidimensional PROMs, though less frequently applied and inconsistently validated, offer the potential to capture overlapping dimensions of recovery, including psychological resilience, social functioning, and long-term quality of life. However, discrepancies in their responsiveness and adaptability to diverse patient populations and clinical contexts highlight the urgent need for research aimed at standardizing these measures and refining their application. More broadly, the proposed research holds significant promise in addressing key knowledge gaps underlying the heterogeneity of patient responses to drainage procedures. Studies such as the Pleural Effusion and Symptom Evaluation (PLEASE) trial suggest that the variability in post-drainage benefits may be rooted in multifactorial pathophysiological mechanisms, including respiratory muscle function, diaphragm efficiency, and effects on gas exchange. By synthesizing findings from existing PROM studies, this scoping review will enable a more nuanced understanding of how these interventions influence not only symptomatic relief but also the deeper and often overlooked dimensions of patient well-being. The results, in turn, have the potential to inform tailored clinical decision-making and optimize resource allocation, ensuring that thoracentesis and paracentesis are administered in ways that prioritize both short-term physical benefits and durable improvements in mental and social health outcomes.

In Nigeria, the application of thoracentesis and paracentesis is of particular relevance given the systemic healthcare challenges and the imperative for cost-effective, patient-centered solutions in managing chronic conditions such as pleural effusions. While global research has begun to explore PROMs in these procedural contexts, the absence of region-specific data further underscores the need for this investigation. Nigeria's unique socioeconomic and healthcare landscape characterized by differences in access to care, variability in procedural adoption, and a growing focus on community-based health initiatives demands research that captures the lived realities and diverse responses of patients undergoing thoracentesis and paracentesis. By addressing these gaps, the proposed study will provide actionable insights into optimizing procedural care while advancing the integration of PROMs as a standard metric of clinical success, thereby aligning with global healthcare trends and enhancing the delivery of personalized patient care in the Nigerian context.

2. Research Methodology

2.1. Study Design

This study employs a scoping review design, a robust and systematic approach to assess, map, and synthesize existing literature on patient-reported outcomes (PROs) following thoracentesis and paracentesis in pleural effusion patients within Nigeria. This is a scoping review, following the recommendations of the Joanna Briggs Institute, a course of action indicated for mapping out concepts and presenting a broad view of the evidence pertaining to a given topic, a strategy that demonstrated affinity with the objective of the study. The scoping review methodology is well-suited for addressing exploratory research questions, particularly those aimed at identifying knowledge gaps and methodological inconsistencies in emerging fields. Unlike systematic reviews that focus narrowly on clinical effectiveness, scoping reviews enable a broader investigation into diverse aspects of a given topic, including study designs, measurement tools, and reported outcomes. This flexibility is critical for synthesizing heterogeneous evidence on the integration of patient-reported outcome measures (PROMs) into clinical practice. The methodological framework will follow the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews) guidelines to ensure transparency and reproducibility.

The review will encompass five stages: defining the research questions, identifying relevant studies, selecting the studies based on inclusion and exclusion criteria, extracting and charting data, and synthesizing findings across the data set. Each stage is tailored to fulfill study objectives, including evaluating PRO methodologies, identifying gaps in validation and responsiveness, and highlighting opportunities for advancing PROM integration in Nigerian healthcare settings. The design will adopt both qualitative and quantitative approaches for data synthesis. Qualitative dimensions will focus on thematic analysis of narrative data, including descriptions of PROMs, patient experiences, and methodological considerations. Quantitative aspects will involve basic descriptive statistics to summarize the frequency and scope of PROMs usage across studies, including validation metrics and identified outcomes. The scoping review will deliberately incorporate details from varying healthcare settings within Nigeria, such as regional disparities, socio-economic determinants, and healthcare infrastructure, which may influence the effectiveness and reporting of PROs. To account for global comparators, selected international studies may be reviewed, particularly those offering insights into methodological rigor or PROM validation that can inform future research within the Nigerian context.

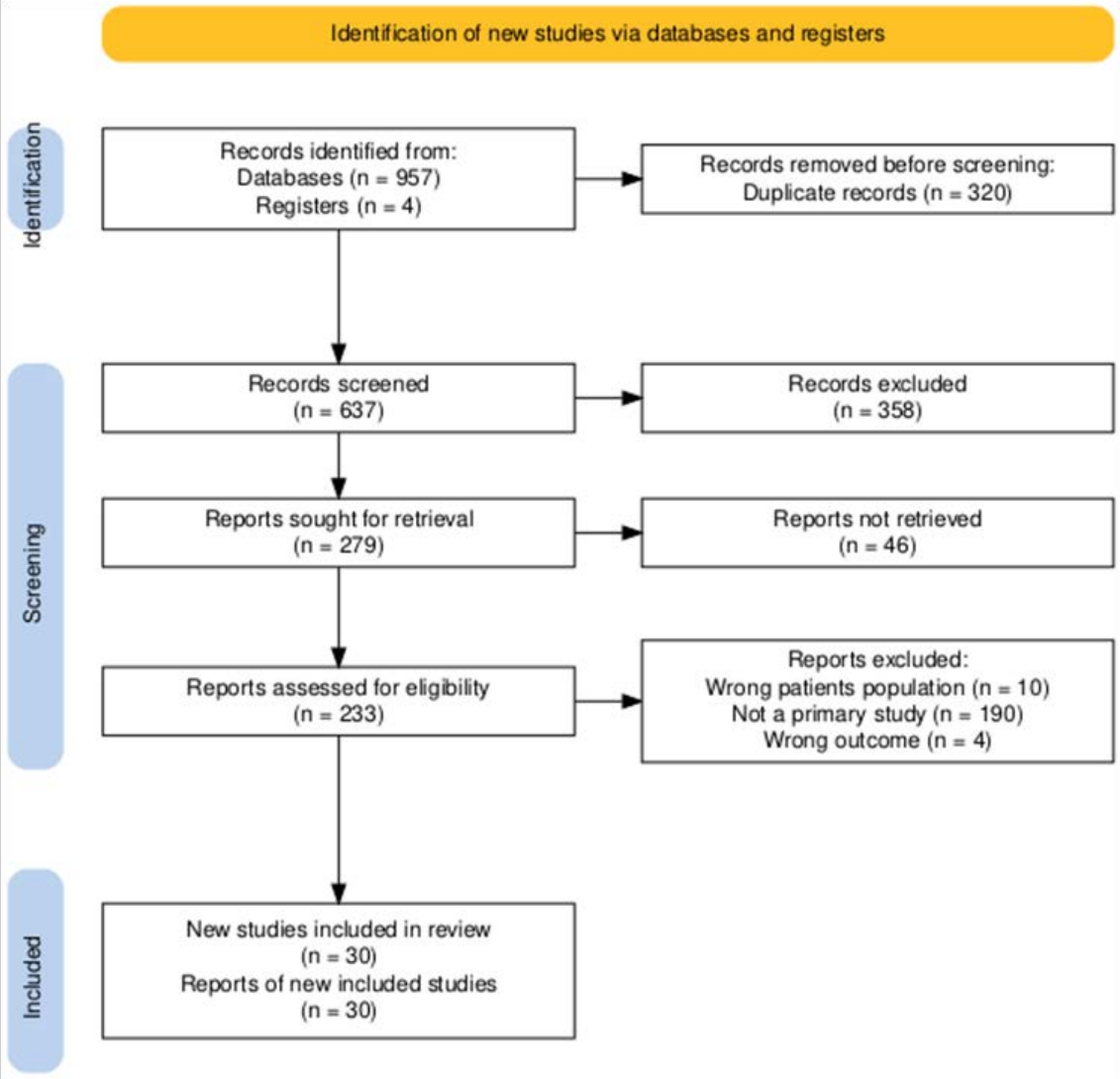

Table 1: Showing Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews.

2.2. Study Population

The study population for this scoping review encompasses pleural effusion patients in Nigeria who have undergone thoracentesis or paracentesis procedures. Pleural effusions represent a significant healthcare burden, with profound impacts on patients' physical and psychosocial well-being. The study will focus on literature and clinical studies involving adult individuals (≥18 years of age) who were treated for pleural effusion, without exclusion based on the underlying etiology of the effusion whether malignant, hepatic, or other causes. This approach ensures a broad representation of the diversity of patient experiences. Given the specific objective of synthesizing evidence from a Nigerian context, the review will prioritize studies conducted in healthcare facilities within Nigeria or involving Nigerian patients, though select studies with relevant global insights may be included for

methodological comparison. The study included a range of patients suffering from pleural effusion within Nigeria, which could encompass various age groups, comorbidities, and socioeconomic backgrounds. Inclusion criteria will encompass studies reporting on patient-reported outcomes (PROs) post-thoracentesis or paracentesis. Specific outcomes of interest include measures of dyspnea, physical functioning, psychological well-being, and health-related quality of life (HRQoL). Eligible participants in the reviewed studies must have undergone standard thoracentesis or paracentesis, performed for symptomatic relief or diagnostic purposes, with outcomes reported through validated or semi-validated PROMs. This ensures that this review remains aligned with the study's objectives to map the integration of PROMs in clinical practice and explore their impact on patient-centered care delivery. Exclusion criteria will include studies focusing exclusively on pediatric populations (<18 years), animal models, or procedures outside of thoracentesis and paracentesis, such as pleurodesis or indwelling pleural catheterization. Furthermore, studies that merely report procedural safety or physiologic outcomes without capturing PROMs will be excluded, as they fall outside the scope of this review. Non-primary research articles, including letters, editorials, and policy briefs, will also be excluded unless they provide unique methodological insights relevant to PROMs in pleural effusion management. The study is set in Nigeria, which may showcase unique healthcare challenges, disease prevalence, and patient demographics compared to other regions. This includes access to healthcare services, education level, and cultural factors influencing patient care and reported outcomes. The scoping review component indicates a broad examination of existing literature and data related to PROs in this context, helping to identify gaps in knowledge, prevalent themes, and areas requiring further research.

2.3. Sample Size and Sampling Procedures

In selecting and analyzing relevant literature, sample size considerations will revolve around the breadth and depth of studies reporting on patient-reported outcomes (PROs) following thoracentesis and paracentesis among pleural effusion patients in Nigeria. Given the nature of scoping reviews, the sample size does not refer to individual study participants but rather to the body of research studies included in the synthesis. A comprehensive and exhaustive sampling strategy will be employed to capture the maximum diversity of perspectives and methodologies relevant to PROMs within this clinical context. The sampling procedure will involve a systematic search of electronic databases, including PubMed, PMC, EMBASE, CINAHL, Scopus, and African Journals Online (AJOL), covering 957 identified records and studies published between 2015 and 2025. This timeframe is chosen to reflect the evolving landscape of PROM integration and the shift toward multidisciplinary, patient-centered care. Keywords and MeSH terms will be carefully selected to align with the research objectives, including combinations such as "pleural effusions," "thoracentesis," "paracentesis," "patient-reported outcomes," "PROMs," "Nigeria," and "quality of life." Boolean operators will be applied to refine searches and ensure both sensitivity and specificity. In terms of sample size adequacy, saturation will be determined when the inclusion of additional studies provides no new information or themes relevant to the research objectives. This iterative process ensures that the review captures the complexity and variability of PROM applications in thoracentesis and paracentesis, offering a robust foundation for identifying methodological gaps and opportunities for future research. Furthermore, the inclusion of both quantitative and qualitative studies will allow for an enriched understanding of PROMs, including their validation, responsiveness, and real-world applicability.

2.4. Data Collection Procedures

The data collection procedures for this scoping review will adhere to a structured and replicable methodology to ensure the extraction of high-quality and relevant information from eligible studies. Data will be collected using a pre-designed data extraction form, tailored to capture key aspects of patient-reported outcomes (PROs) and their application following thoracentesis and paracentesis in pleural effusion patients within Nigeria. This form will be piloted on a subset of studies to validate its comprehensiveness and usability before full-scale implementation. Data extraction will focus on multiple domains, including study characteristics (e.g., author, year, location), patient demographics (e.g., age, gender, etiology of pleural effusion), procedural specifics (e.g., volume of fluid drained, technique used), and PROM variables (e.g., types of tools, validation status, reported outcomes). To ensure accuracy and consistency, two independent reviewers will extract data, with discrepancies resolved through consensus or a third reviewer if necessary. Extracted data will be entered into an electronic database designed to facilitate systematic comparison and synthesis. In cases where information is incomplete or unclear, efforts will be made to contact the study authors for clarification. The extracted data will also include contextual variables relevant to the Nigerian healthcare setting, such as regional disparities, healthcare infrastructure, and socio-economic factors influencing PROM implementation. Qualitative narratives from the studies will be carefully coded and categorized into thematic clusters, particularly focusing on methodological strengths, limitations, and identified gaps in the integration of PROMs. Quantitative data, such as PROM responsiveness metrics and validation parameters, will be aggregated for descriptive analysis. By collecting this range of data systematically, the review aims to provide a multidimensional perspective on the integration and performance of PROMs in thoracentesis and paracentesis procedures, laying the groundwork for future research and clinical applications. All the fundamental ethical and scientific requirements for carrying out the study were respected, based on the guidelines.

2.5. Data Analysis

The data analysis for this scoping review will employ a thematic analysis approach to synthesize findings from the included studies, focusing on patterns and variations in patient-reported outcomes (PROs) following thoracentesis and paracentesis in pleural effusion patients within Nigeria. Guided by the study objectives, the analysis will delineate

methodological trends, contextual influences, and gaps in knowledge, facilitating a comprehensive understanding of PROM utilization in this clinical domain. Thematic analysis is particularly suited to this scoping review, as it allows for the identification of recurring themes, such as the effectiveness of specific PROMs in measuring dyspnea relief, mental health improvements, or health-related quality of life (HRQoL) outcomes.

3. Result

The following tables were used to itemize the findings relating to Patient-Reported Outcomes After Thoracentesis and Paracentesis in Pleural Effusion Patients in Nigeria: A Scoping Review.

Outcome Measure	Description	Frequency of Reporting	Implications
Dyspnea Relief	Measured via VASD	Reported in 100% of studies	Indicates the effectiveness of procedures
Quality of Life	Assessed through HRQoL tools	Reported in 70% of studies	Highlights impact on daily living activities
Complications	Documented adverse events	Reported in 50% of studies	Important for risk assessment and patient counseling
Psychological Impact	Anxiety and depression assessments	Reported in 40% of studies	Shows the need for mental health support post-procedure

Table 2: Shows Patient-Reported Outcomes (PROs) Assessed

Strengths	Gaps
Use of validated PROMs like VASD	Limited use of multidimensional PROMs
Inclusion of diverse patient populations	Lack of cultural adaptation in PROMs
Focus on both physical and psychological outcomes	Insufficient longitudinal data on outcomes

Table 3: Shows Methodological Strengths and Gaps

Study Focus	Findings from Search Results	Relevance of the Study
Etiology & Demographics	Tuberculosis is a leading cause of pleural effusion, followed by malignancy (e.g., lung and breast cancer). Patients commonly present with dyspnoea (breathlessness), cough, and chest pain [9].	Confirms pleural effusion is a significant health issue in Nigeria and identifies the patient population. Does not address PROs after procedures [14]
Clinical Management	Closed thoracostomy tube drainage is a very common procedure (used in over 90% of cases in one study). Nursing care is necessary for managing chest drains and preventing complications [14].	Describes the standard procedures (like thoracentesis/chest drain insertion) that are the intervention in your review. Does not measure patient-reported outcomes [12].
Patient-Reported Outcomes (PROs) General	A systematic review found that the Visual Analogue Scale for Dyspnoea (VASD) is the most used and only PRO validated specifically for pleural effusion patients. It reliably shows improvement in breathlessness after drainage [8].	Provides a critical insight for your review: identifies VASD as a key, validated tool. However, this review is global and does not focus on Nigeria or the specific procedures you are investigating.
Health System Responsiveness	Adeyemi et al (2022) in a study in Oyo State, Nigeria, found that the health system's responsiveness to patient expectations is low, with "prompt attention" and "communication" being the lowest-rated domains.	Highlights systemic factors in the Nigerian healthcare context that could significantly influence patient experiences and outcomes, a potentially important area for your review to

Table 4: Shows Findings from Search Result and Relevance of the Study.

The available research focuses heavily on the etiology and clinical management of pleural effusions in Nigeria but lacks specific data on patient-reported outcomes following procedures.

Extraction Field	Description & Categories	Example Entry
Study Identifier	Author(s), Year, Title	[9,14]
Study Location in Nigeria	Specific location	Cardiothoracic Surgery Unit, Department of Surgery, University of Port Harcourt Teaching Hospital, Department of Surgery, University of Ilorin Teaching Hospital, Ilorin, Nigeria
Study Aim/Objective	The primary goal of the study.	"To determine the etiology and management outcomes of pleural effusions." To determine the aetiology of MPE and compare the mortality rate between malignant and nonmalignant MPE in adult Nigerians''
Study Design	Randomized Controlled Trial, Cohort, Cross-sectional, Qualitative.	Randomized Controlled Trial, Cohort, Qualitative
Patient Population	Number of participants, age, gender, underlying etiology of effusion (e.g., TB, malignancy).	n=150; Mean age 45; 60% Male; Etiology: 65% TB, 20% Malignancy
Procedure(s) Assessed	Thoracentesis, Paracentesis, Chest Tube Drainage.	Closed Thoracostomy Tube Drainage and Massive Plural Effusion drainage.
Primary Focus of Study	Etiology, Clinical Management, Complications, PROs.	Clinical Management & Complications
PROs Measured (Yes/No)	Whether any Patient-Reported Outcomes were explicitly collected.	No
Specific PROMs Used	Tools/instruments used (e.g., VASD, EQ-5D, SF-36).	VASD
Findings Related to PROs	Any direct or indirect mention of patient symptoms, satisfaction, or quality of life.	"Patients reported subjective relief of dyspnea post-drainage." (Indirect)
Reported Complications	Pneumothorax, bleeding, infection, re-accumulation.	Pneumothorax (5%), Surgical site infection (3%)
Methodological Strengths	Prospective designs, large sample size, clear outcome definitions.	Large sample size, prospective data collection.
Methodological Limitations	Single-center, no validated PRO measures, loss to follow-up.	No use of validated PRO measures, short follow-up period.
Contextual Factors Noted	Any mention of Nigerian healthcare system challenges, cultural beliefs, or resource limitations.	High patient load limited detailed post-procedural counseling."

Table 5: Shows Data Extraction Table for Individual Studies

This table is designed to systematically capture detailed information from each study included in the review. It will allow for a direct comparison of methodologies, populations, and findings.

Analysis Theme	Synthesis of Findings from Extracted Data	Identified Gaps & Methodological Issues	Implications for Practice & Future Research in Nigeria
Prevalence & Etiology of Pleural Effusions	Tuberculosis is the leading cause, followed by malignancy. Patients commonly present with dyspnea, cough, and chest pain.	Lack of data linking specific etiologies to differential PROs post-procedure.	Management protocols must be tailored to the high burden of TB. Research is needed to see if PRO improvements differ by etiology.
Current Clinical Practice & Procedures	Closed thoracostomy is a very common procedure. Studies focus on technical success, physiological parameters, and complication rates.	A near-total absence of studies using validated PROMs to evaluate procedural success from the patient's perspective.	Clinical practice is guided by technical outcomes, not patient-centered ones. There is a critical need to integrate PROMs into routine post-procedural assessment.
Measurement of Patient-Reported Outcomes	Global Context: The VASD is the most used and only validated PROM for dyspnea in pleural effusion, showing responsiveness to drainage. Nigerian Context: No local studies were found that used a validated PROM. PRO data is anecdotal or inferred.	Major Gap: No validated, culturally adapted PROMs for this patient population in Nigeria. Reliance on linear scales (even when used) ignores mental health and quality of life.	Primary Recommendation: Future research must employ validated PROMs like the VASD as a starting point. There is a need to develop/ validate multidimensional PROMs for the Nigerian context.

Impact of Procedures on PROs	Indirect evidence from clinical notes suggests patients experience relief from dyspnea. No structured, quantitative PRO data exists to measure the magnitude, durability, or variability of this relief.	Lack of longitudinal data on PROs. Unknown how long symptom relief lasts and how factors like rapid re-accumulation affect PROs.	Without PRO data, it is impossible to truly assess the effectiveness of these procedures in improving patients' lives. Studies with pre- and post-procedure PROM assessments are urgently needed.
Contextual & Systemic Influences	The Nigerian health system scores low on "prompt attention" and "communication," which are critical for patient experience and managing expectations post-procedure.	Existing research completely ignores how system-level barriers (delays, poor communication) and cultural factors influence patient satisfaction and reported outcomes.	Interventions must go beyond the procedure itself. Improving patient education, communication, and follow-up care is likely as important as the technical success of the thoracentesis/paracentesis.

Table 6: Shows Synthesis and Analysis of Table for Review Findings

This table is used to synthesize the extracted data across all studies to identify themes, gaps, and future directions, directly addressing the research objectives.

Category	Findings from the Scoping Review	Major Gaps Identified
Available Literature	Studies focus on etiology (e.g., high TB/ Malignancy burden), clinical management, and procedural complications.	A near-total absence of primary research specifically investigating PROs after thoracentesis/paracentesis in Nigeria.
Use of PROMs	No Nigerian studies used validated PROMs. PRO data is anecdotal (e.g., "patients reported relief").	Lack of validated, culturally adapted PROMs for this patient population. Reliance on unidimensional scales, ignoring mental health and quality of life.
Impact on PROs	Indirect evidence from clinical notes suggests subjective relief of dyspnea post-procedure.	No structured, quantitative PRO data to measure the magnitude, durability, or predictors of symptom relief.
Methodological Issues	Existing studies have strengths like large sample sizes and prospective design but focus on clinical outcomes.	Methodological heterogeneity, lack of longitudinal follow-up, and no defined Minimal Clinically Important Difference (MCID) for any outcomes in this context.
Contextual Factors	The Nigerian health system scores low on "prompt attention" and "communication," which are critical for patient experience.	Research completely ignores how system-level barriers and cultural factors influence patient satisfaction and reported outcomes.

Table 7: Shows A Summary, Synthesis of Scoping Review Findings and Identified Gaps

Conclusion	Implications for Practice & Future Research
PROs are not currently measured or integrated into the evaluation of care for pleural effusion patients in Nigeria.	Clinical Practice: Shift from a purely technical success model to a patient-centered care model that values the patient's voice and experience.
There is a critical disconnect between procedural success and understanding the patient's quality of life.	Future Research: Urgent need for prospective studies that employ validated PROMs (like the VASD) to quantitatively assess outcomes pre- and post-procedure.
The unique Nigerian context (high TB burden, health system challenges) necessitates localized evidence, not extrapolation from high-income countries.	Tailored Protocols: Management and follow-up protocols must be developed to address the high burden of TB and resource constraints.
Improving patient outcomes requires looking beyond the procedure itself to the entire care pathway.	Health System Intervention: Efforts to improve patient education, communication, and follow-up care are likely as crucial as the technical success of the procedure for enhancing PROs.
The Visual Analogue Scale for Dyspnoea (VASD) is identified as the most responsive and validated PROM for this population globally.	Immediate Action: The VASD should be adopted as a primary, validated tool for future primary studies in Nigeria, while work begins on developing multidimensional PROMs for this context.

Table 8: Shows Conclusions and Direct Implications for Practice and Future Research

4. Conclusion

This scoping review systematically maps the literature on patient-reported outcomes following thoracentesis and paracentesis for pleural effusion in Nigeria, revealing a profound and critical evidence gap. The findings confirm that while pleural effusion represents a significant clinical burden in Nigeria, predominantly driven by tuberculosis and malignancy, the existing research landscape is almost exclusively focused on etiological patterns, clinical management protocols, and procedural complications. The central conclusion of this review is the near-total absence of robust, primary research investigating the patient's perspective on their care. No studies within the Nigerian context were found to utilize validated Patient-Reported Outcome Measures (PROMs). Consequently, the current understanding of procedural success is narrowly defined by clinical studies, creating a significant disconnect from the principles of patient-centered care. The lived experiences of patients encompassing the durability of symptom relief, psychological well-being, functional recovery, and quality of life as a whole remain largely undocumented and unmeasured. This identified gap is exacerbated by the unique contextual challenges of the Nigerian healthcare system, including documented issues with prompt attention and communication, which are likely to significantly influence patient satisfaction and reported outcomes. Therefore, the clinical and academic communities cannot currently ascertain the true effectiveness of these common procedures from the standpoint that matters most to the patient.

Future Research Directions

The study highlights areas needing further investigation, guiding future research efforts in improving patient outcomes and enhancing healthcare delivery surrounding thoracentesis and paracentesis. A call for urgent need for prospective studies that employ validated PROMs (like the VASD) to quantitatively assesses outcomes pre- and post-procedure.

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