

## **DEVELOPMENT OF A CLINICAL PROCEDURAL COMPETENCY EVALUATION TOOL (CPCET) FOR PULMONARY TOILETTE ON PEDIATRIC RESPIRATORY THERAPISTS**

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### **ABSTRACT**

This descriptive-developmental design aimed to develop and validate the Clinical Procedural Competency Evaluation Tool (CPCET) on pulmonary toilette among pediatric respiratory therapists. Data collection involved 22 respiratory therapists responding to a self-made structured questionnaire to determine the current practices, challenges and barriers for evaluating competency. Likewise, a self-made CPCET was developed and validated in collaboration with subject matter experts including pediatric respiratory therapists, pediatric clinicians and clinical educators ensuring relevance and validity of the tool's set competencies. Results revealed that the current practice proved to be structured and proactive though the prominent challenges include lack of standardized tool, time constraints in clinical practice and variability in patient presentation. The gathered Content Validity Index (CVI) values (0.99 – 1.0) confirmed the high relevance of the tool's components. Whereas, the inter-rater reliability testing using Cohen's Kappa, resulted in fair to moderate agreement across competency domains (Aerosol Therapy: 0.424, Chest Physiotherapy: 0.362, and In-Line Suctioning: 0.448) suggestive of subjective performance evaluations of the raters which earmarked improvement on evaluation practices. The study concluded that the developed and validated CPCET addressed the identified gaps in the current evaluation practices providing a reliable structured framework in the performance evaluation system among pediatric respiratory therapists. Thus, supporting continuous professional development and improving the quality of pediatric respiratory care commensurate to the best health outcome for the Filipino children and proficiency of health care workers specifically Filipino Pediatric Respiratory Therapists.

**Keywords:** Pediatric respiratory therapist, pulmonary toilette, clinical procedural competency evaluation tool

### **INTRODUCTION (Font size of heading 12 Bold in Capital Letters, Times New Roman)**

The incidence of respiratory diseases among children is of significant concern in the Philippines yet no set clinical guidelines nor standard Clinical Procedural Competency Evaluation Tool (CPCET) are set on skills development for the practicing pediatric respiratory therapists (PRTs). The identified practice-oriented gaps are competency, system-level impact of PRTs, (current practice, challenges, barriers and criteria for assessments) that optimize respiratory therapy practices. This study seeks to develop a standardized (CPCET) for Pulmonary Toilette to respond to the need for standardized skills' assessment tool and provide a structured framework for evaluating and enhancing clinical competency.

## LITERATURE REVIEW

The integration of these key educational theories such as Competency-Based Education (CBE), Simulation-Based Learning (SBL), and Adult Learning Theory defined the development of the tool. Simulation based learning are backed-up by articles stating continuous evaluation and assessment of these core competencies contribute to healthcare organizations' competitiveness. This may indicate that the level to which professionals demonstrate these competencies might impact quality of care and patient safety. (Al Jabri et al., 2023) Direct observation of procedural skills (DOPS) is another method used in workplace-based assessments, providing real-time feedback and identifying performance gaps. (Lagoo 2021)

The Role of Innovative Training Models such as the Respiratory Therapy Practice-Based Outcomes Initiative (RT-PBOI) highlights the importance of RTs practicing at the top of their scope, focusing on complex and high-risk patients, and using critical thinking skills with proper training and evidence-informed protocols, this promotes inter-professional collaboration, enhancing job satisfaction and staff retention—factors that are essential for maintaining a competent and motivated workforce (Dubois, 2021).

## METHODOLOGY

### Respondents of the Study

This descriptive-developmental research included 22 pediatric respiratory therapists at Philippine Children's Medical Center via purposive sampling meeting specific criteria as licensed professionals with at least six months of experience in performing pulmonary toilette procedures, such as aerosol therapy, chest physiotherapy, and suctioning. The recommended sample size of 22 from a population of 23 pediatric respiratory therapists made the data reliable since almost all of the population was included.

### Instrumentation

This study used a self-made structured questionnaire and self-constructed Clinical Procedural Competency Evaluation Tool (CPCET) that entailed validation of content and its relevance. The questionnaire was used to collect data on the current practices, limitations, and challenges in evaluating clinical procedural competency in pulmonary toilette. The questionnaire has three sections: (1) Demographics, capturing respondent details like age, gender, occupation, years of experience, and healthcare institution; (2) Current Practices, exploring the frequency, methods, evaluators, and criteria used in competency evaluations; and (3) Challenges and Barriers, identifying issues such as the lack of standardized tools, time constraints, and inadequate training resources. The questions were structured to collect categorical responses and specific insights aligned with the study objectives.

The self-constructed Clinical Procedural Competency Evaluation Tool (CPCET) underwent relevance rating by experts covering the sections such as preparation, execution, and post-procedure care. Validation of the self-constructed CPET were reviewed in 3 rounds by a panel of experts in pediatric respiratory therapy and professional healthcare educators for their comments and suggestions to ensure all specific applicable competencies were covered. Feedback from these experts were noted to modify the tool and refine scoring criteria for clarity and usability. Two main validation methods were employed: Cohen's Kappa for inter-rater reliability and Content Validity Index (CVI) as assessed by experts.

## Data Collection Procedure

The data collection procedure was implemented through the self-made structured questionnaire distributed among the 22 respondents to determine current practices, challenges and barriers in competency evaluation. Whereas, the proposed self-structured CPCET was developed and validated in collaboration with subject matter experts, including pediatric respiratory therapists, pediatric clinicians and clinical educators to measure its relevance and content validity. Raters performed competency evaluation using the developed and validated tool on the 22 respondents for reliability testing in 2 separate occasions. A waiver of confidentiality was sought prior to implementation of the data collection.

## Data Analysis

The data collected from the validated instruments were measured and analyzed based on the Experts' Relevance Scale using the 4-point Likert Scale (4 -Highly relevant, 3-Quite relevant, 2-Slightly relevant, 1-Not relevant) for the self-constructed structured questionnaire and CPCET. The statistical analysis of data utilized frequency and percentage distribution to summarize data gathered from the structured questionnaire, content validity index (CVI) to determine the validity of the proposed CPCET and Cohen Kappa to determine the inter-rater reliability of the CPCET among the evaluators.

## RESULTS

**Table 1. Current Practices for Evaluating Clinical Procedural Competency in Performing Pulmonary Toilette among Pediatric Respiratory Therapists**

<b>1. How often is clinical procedural competency in pulmonary toilette formally evaluated in your institution?</b>	<b>F</b>	<b>%</b>	<b>Rank</b>
· Monthly	10	45.45	2
· Quarterly	11	50.00	1
· Annually	0	0.00	
· Only during onboarding	0	0.00	
· Not formally evaluated	1	4.55	3
<b>2. What methods are used to evaluate clinical competency in performing pulmonary toilette? (Select all that apply.)</b>	<b>F</b>	<b>%</b>	
· Direct observation by a supervisor or mentor	21	95.45	1
· Competency checklists	19	86.36	2
· Simulation-based assessments	16	72.73	3
· Peer review	14	63.64	4
· Self-assessment	16	72.73	3
· Patient outcomes (e.g., clinical improvement)	19	86.36	2
· Other (please specify):	0	0.00	
<b>3. Who typically evaluates the competency of pediatric respiratory therapists in your institution?</b>	<b>F</b>	<b>%</b>	
· Clinical educators	3	13.64	4
· Supervisors or managers	12	54.55	2
· Senior respiratory therapists	14	63.64	1

· Multidisciplinary team (e.g., physicians, nurses)	4	18.18	3
· Other (please specify):	0	0.00	
<b>4. What criteria are commonly assessed when evaluating competency in pulmonary toilette? (Select all that apply.)</b>			
	<b>F</b>	<b>%</b>	
· Knowledge of indications and contraindications	22	100.00	1
· Proper use of suction equipment	20	90.91	2
· Technique for secretion removal	20	90.91	2
· Patient monitoring and safety during the procedure	22	100.00	1
· Communication with the patient and family	20	90.91	2
· Documentation of the procedure	20	90.91	2

Table 1. The Frequency of Clinical Procedural Competency Evaluation showed that 1. Quarterly Evaluations (50%) displayed the highest percentage, followed by Monthly Evaluations (45%) and lowest percentage showed for the Not Formally Evaluated (5%), Annually and Only During Onboarding (0%) This highlights a regular, systematic evaluations to maintaining clinical competency. 2. The Methods Used to Evaluate Clinical Competency revealed Direct Observation by a Supervisor or Mentor (95%) Competency Checklists and Patient Outcomes (86%) Simulation-Based Assessments and Self-Assessment (73%) trailed by Peer Review (63%). This emphasized that the methods stated are mostly acceptable. 3. Who Typically Evaluates the Competency of Pediatric Respiratory Therapists, the Senior Respiratory Therapists (64%) followed by the Supervisors or Manager (54%) where Multidisciplinary Team (18%) Clinical Educators (14%) pointed to a preference for experienced practitioners in the assessment process. 4. Based on the Criteria Commonly Assessed When Evaluating Competency in Pulmonary Toilette, Knowledge of Indications and Contraindications and Patient Monitoring and Safety (100%) the Proper Use of Suction Equipment, Technique for Secretion Removal, Communication with the Patient and Family, Documentation of the Procedure (91%) signified these are the universally assessed criteria.

**Table 2. Challenges and Limitations are Associated with Current Evaluation Practices for Pulmonary Toilette among Pediatric Respiratory Therapists**

<b>1. What challenges have you encountered in evaluating procedural competency in pulmonary toilette? (Select all that apply.)</b>	<b>F</b>	<b>%</b>	<b>Rank</b>
· Lack of standardized evaluation tools	12	54.55	1
· Limited availability of clinical educators or supervisors	4	18.18	4
· Time constraints during clinical practice	10	45.45	2
· Variability in patient presentation	10	45.45	2
· Resistance from staff to undergo evaluations	1	4.55	5
· Inadequate training resources (e.g., simulation labs, equipment)	8	36.36	3
· Other (please specify):	1	4.55	5
	0	0.00	
<b>2. In your opinion, what are the limitations of current evaluation practices for pulmonary toilette? (Select all that apply.)</b>	<b>F</b>	<b>%</b>	
· Over-reliance on subjective assessments	11	50.00	2
· Inconsistent evaluation criteria	9	40.91	3

· Insufficient frequency of evaluations	6	27.27	5
· Lack of integration with patient outcomes	7	31.82	4
· Insufficient feedback provided to therapists	13	59.09	1
· Other (please specify):	0	0.00	

Table 2. Based on the data gathered under Challenges the Lack of Standardized Evaluation Tools (54%) Time Constraints During Clinical Practice and Variability in Patient Presentation (45%) Inadequate Training Resources (41%) Limited Availability of Clinical Educators or Supervisors (18%) Resistance from Staff to Undergo Evaluations (5%) revealed a significant need for the development and implementation of standardized tools to ensure consistent and fair evaluations including difficulties in effective time management and dealing with diverse patient cases, which could impact the thoroughness of evaluations. 2. Based on the data gathered under Limitations, Insufficient Feedback Provided to Therapists (59%) Over-reliance on Subjective Assessments (50%) Inconsistent Evaluation Criteria (41%) trailed by Lack of Integration with Patient Outcomes (32%) Insufficient Frequency of Evaluations (27%)

This highlighted the need for more detailed and constructive feedback to improve the current evaluation practices.

**Figure 1. The developed Clinical Procedural Competency Evaluation Tool (CPCET) for Pulmonary Toilette on Pediatric Respiratory Therapists**

**Figure 1.1 Aerosol Therapy**

Basic Neonatal and Pediatric Respiratory Therapy  
Intensive Care Unit Training  
Procedural Competency Evaluation

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Name of Hospital: \_\_\_\_\_ Position: \_\_\_\_\_  
 Date of employment: \_\_\_\_\_ Years in Service: \_\_\_\_\_  
 Evaluator: \_\_\_\_\_ Gender: \_\_\_\_\_

**Rating Scale:**

- 3 Above Expectation** (shows exceptional proficiency)
- 2 As Expected** (meets)
- 1 Below Expectation** (fails to meet)

Aerosol Therapy	Rating	
<b>I. Preparation</b>		
1. Politely Introduce self and department.		
2. Check the patient’s identification:		
a. Patient’s name		
b. Patient’s medical record number		
3. Check the patient’s diagnosis.		
3. Verify physician’s order.		
a. Prescribed aerosolized medication		
b. Frequency of treatment		
c. Objective of the ordered therapy/diagnostic procedure		

d. Clarify with the physician if necessary		
4. Select and gather all needed equipment: Each item should be clean and ready to use. a. Stethoscope b. Nebulizer machine/Oxygen nipple adaptor c. Aerosol or nebulizer kit d. Prescribed medication		
5. Check functionality of equipment. a. Confirm all devices are operational or functioning properly. b. Check the nebulizer's air source/oxygen driven source.		
6. Perform hand hygiene Wash hands thoroughly for at least 20 seconds with soap and water, or use an alcohol-based hand sanitizer to ensure cleanliness.		
<b>II. Pre-therapy</b>		
1. Correctly identifies patient in the room/ward. a. Patient's name b. Patient's medical record number		
2. Introduce self and department.		
3. Explain the procedure to patient/watcher/relatives: a. Prescribed aerosolized medication b. Frequency of therapy c. Describe the aerosol produced as cold mist the child might feel/experience d. Purpose of therapy e. Duration of therapy f. Cleaning of nebulizer kit g. Confirm patient permission to perform treatment		
4. Assess patient Perform baseline physiologic assessment: a. Auscultate to evaluate respiratory status (breath sounds) b. Oxygen saturation c. Heart rate d. Dyspnea rating		
5. Position patient a. Comfortable, optimal position b. If able, sit upright		
<b>III. During Therapy</b>		
1. Proper assembly of equipment and test equipment prior to patient application of treatment: Plug and place the machine on a leveled surface.		
2. Administer Medication: a. Put the prepared medicine into the nebulizer chamber. b. Connect the nebulizer kit to the machine/oxygen driven source c. Activates machine/oxygen driven source and verifies aerosol generation.		
3. Place the nebulizer kit: a. If intubated, place the nebulizer kit proximal to the patient's artificial airway. b. For non-intubated, fit the mask securely over the patient's nose		

and mouth		
<p>4. Monitor Patient:</p> <ul style="list-style-type: none"> <li>a. Assess the patient's response to therapy</li> <li>b. Monitors physiologic parameters: <ul style="list-style-type: none"> <li>b.1 Auscultate to evaluate respiratory status (breath sounds)</li> <li>b.2 Oxygen saturation</li> <li>b.3. Heart rate</li> <li>b.4 Dyspnea rating</li> </ul> </li> <li>c. Observe for any signs of adverse reactions <ul style="list-style-type: none"> <li>c.1 If noted adverse reactions, STOP therapy.</li> <li>c.2 Call the attending physician and nurse</li> </ul> </li> </ul>		
<p><b>IV. Post-therapy</b></p> <p>1. Monitors physiologic parameters:</p> <ul style="list-style-type: none"> <li>a. Auscultate to evaluate respiratory status (breath sounds)</li> <li>b. Oxygen saturation</li> <li>c. Heart rate</li> <li>d. Dyspnea rating</li> <li>e. Observe for any signs of improvement or adverse reactions If noted adverse reactions, call the attending physician and nurse</li> </ul>		
<p>2. Re-position patient: Comfortable, optimal position</p>		
<p>3.. Equipment care:</p> <ul style="list-style-type: none"> <li>a. Clean the nebulizer kit, airdry</li> <li>b. Put away devices used correctly</li> <li>c. Dispose of infectious waste correctly</li> </ul>		
<p>4. Perform hand hygiene: Wash hands thoroughly for at least 20 seconds with soap and water, or use an alcohol-based hand sanitizer to ensure cleanliness.</p>		
<p>5. Document:</p> <ul style="list-style-type: none"> <li>a. Record the given procedure</li> <li>b. Record the patient's response to the therapy: <ul style="list-style-type: none"> <li>b.1 improved physiologic parameters</li> <li>b.2 adverse effects</li> </ul> </li> <li>c. Notifies attending physician for any recommendations or modifications to patient care plan if indicated</li> </ul>		
<p><b>V. Safety and Hygiene</b></p> <p>1. Wear Personal Protective Equipment:</p> <ul style="list-style-type: none"> <li>a. Face Mask</li> <li>b. Gloves</li> <li>c. Gown</li> </ul>		
<p>2. Avoid under or over therapy:</p> <ul style="list-style-type: none"> <li>a. Frequency of therapy</li> <li>b. Duration of therapy</li> </ul>		
<p>3. Follow protocols on:</p> <ul style="list-style-type: none"> <li>a. Aerosol Therapy</li> <li>b. Infection Control</li> </ul>		

c. Patient Safety		
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Printed Name and Signature of Evaluator      Printed Name and Signature of PRT

**Figure 1.2 Chest Physiotherapy (CPT)**  
Basic Neonatal and Pediatric Respiratory Therapy  
Intensive Care Unit Training  
Procedural Competency Evaluation

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
Name of Hospital: \_\_\_\_\_ Position: \_\_\_\_\_  
Date of employment: \_\_\_\_\_ Years in Service: \_\_\_\_\_  
Evaluator: \_\_\_\_\_ Gender: \_\_\_\_\_

- Rating Scale:**
- 3 Above Expectation** (shows exceptional proficiency)
  - 2 As Expected** (meets)
  - 1 Below Expectation** (fails to meet)

Chest Physiotherapy (CPT)	Rating	
<b>I. Preparation</b>		
1. Politely Introduce self and department.		
2. Check the patient’s identification: <ul style="list-style-type: none"> <li>a. Patient’s name</li> <li>b. Patient’s medical record number</li> </ul>		
2. Check the patient’s diagnosis.		
3. Verify physician’s order. <ul style="list-style-type: none"> <li>a. Determine lobes/segments to be drained</li> <li>b. Check for any possible contraindications</li> <li>c. Review latest chest x-ray</li> <li>d. Check the feeding frequency.</li> <li>e. Objective of the ordered therapy/diagnostic procedure</li> <li>f. Clarify with the physician if necessary</li> </ul>		
4. Select and gather all needed equipment: <ul style="list-style-type: none"> <li>Each item should be clean and ready for use.</li> <li>a. Stethoscope</li> <li>b. Percussion devices (manual or mechanical)</li> <li>c. Pulse oximeter</li> </ul>		
5. Check functionality of equipment. <ul style="list-style-type: none"> <li>Confirm all devices are operational or functioning properly.</li> </ul>		
6. Perform hand hygiene <ul style="list-style-type: none"> <li>Wash hands thoroughly for at least 20 seconds with soap and water, or</li> <li>use an alcohol-based hand sanitizer to ensure cleanliness.</li> </ul>		
<b>II. Pre-Physiotherapy</b>		
1. Correctly identifies patient in the room/ward. <ul style="list-style-type: none"> <li>a. Patient’s name</li> <li>b. Patient’s medical record number</li> </ul>		
2. Introduces self and department		



<p>3. Explain the procedure to patient/watcher/relatives:</p> <ol style="list-style-type: none"> <li>Prescribed therapy.</li> <li>Frequency of therapy.</li> <li>Describe the tapping of chest (front/back) and child might feel chest vibration similar to a back massage.</li> <li>Purpose of therapy.</li> <li>Duration of therapy.</li> <li>Prescribed postural or body position of the patient</li> <li>Confirm patient permission to perform treatment (if applicable)</li> </ol>		
<p>4. Assess patient</p> <p>Perform baseline physiologic assessment:</p> <ol style="list-style-type: none"> <li>Auscultate to evaluate respiratory status (breath sounds).</li> <li>Oxygen saturation.</li> <li>Heart rate.</li> <li>Observe for any signs of respiratory distress: If noted, call the attending physician and nurse.</li> </ol>		
<p>5. Position patient:</p> <ol style="list-style-type: none"> <li>Optimal, comfortable position to maximize effect of postural drainage.</li> <li>Use pillows or towel to aid in correct position.</li> </ol>		
<p><b>III. During Physiotherapy</b></p> <ol style="list-style-type: none"> <li>Postural Drainage – Position the patient based on the affected area.</li> <li>Physio-therapy Technique: Hand-clapping or Percussion – use palm cup or mechanical devices: <ol style="list-style-type: none"> <li>Explain the precautions to the relatives/patient.</li> <li>Explain the hand-clapping or percussion technique.</li> <li>Position the patient based on the affected area.</li> <li>Perform hand-clapping/percussion technique using the palm cup or mechanical device on the affected area.</li> <li>Maintains position per affected area for appropriate time interval (3 to 5 min) as tolerated.</li> <li>Repositions patient and repeats procedure as indicated and tolerated.</li> </ol> </li> </ol>		
<p>4. Monitor Patient.</p> <ol style="list-style-type: none"> <li>Assess the patient's response to therapy</li> <li>Monitors physiologic parameters: <ol style="list-style-type: none"> <li>Auscultate to evaluate respiratory status (breath sounds)</li> <li>Oxygen saturation</li> <li>Heart rate</li> </ol> </li> <li>Observe for any signs of respiratory distress or adverse reactions: <ol style="list-style-type: none"> <li>If noted adverse reactions, STOP treatment</li> <li>Call the attending physician and nurse</li> </ol> </li> </ol>		
<p><b>IV. Post-Physiotherapy</b></p>		

<p>1. Monitors physiologic parameters:</p> <ul style="list-style-type: none"> <li>a. Auscultate to evaluate respiratory status (breath sounds)</li> <li>b. Oxygen saturation</li> <li>c. Heart rate</li> <li>d. Dyspnea rating</li> <li>e. Blood Pressure</li> <li>f. Observe for any signs of improvement or adverse reactions: If noted adverse reactions, call the attending physician and nurse</li> </ul>		
<p>2. Re-position patient: Comfortable, optimal position</p>		
<p>3. Equipment care:</p> <ul style="list-style-type: none"> <li>a. Clean the nebulizer kit, airdry</li> <li>b. Put away devices used correctly</li> <li>c. Dispose of infectious waste correctly</li> </ul>		
<p>4. Perform hand hygiene: Wash hands thoroughly for at least 20 seconds with soap and water, or use an alcohol-based hand sanitizer to ensure cleanliness.</p>		
<p>5. Document:</p> <ul style="list-style-type: none"> <li>a. Record the given procedure</li> <li>b. Record the patient’s response to the therapy: <ul style="list-style-type: none"> <li>b.1 improved physiologic parameters</li> <li>b.2 adverse effects</li> </ul> </li> <li>c. Notifies attending physician for any recommendations or modifications to patient care plan if indicated</li> </ul>		
<p><b>V. Safety and Hygiene</b></p> <p>1. Wear Personal Protective Equipment:</p> <ul style="list-style-type: none"> <li>a. Face Mask</li> <li>b. Gloves</li> <li>c. Gown</li> </ul>		
<p>2. Avoid under or over therapy:</p> <ul style="list-style-type: none"> <li>a. Frequency of therapy</li> <li>b. Duration of therapy</li> </ul>		
<p>3. Follow protocols on:</p> <ul style="list-style-type: none"> <li>a. Chest-physio Therapy</li> <li>b. Infection Control</li> <li>c. Patient Safety</li> </ul>		

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PRT

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**Figure 1.3 Suction**  
Basic Neonatal and Pediatric Respiratory Therapy  
Intensive Care Unit Training  
Procedural Competency Evaluation

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Name of Hospital: \_\_\_\_\_ Position: \_\_\_\_\_  
 Date of employment: \_\_\_\_\_ Years in Service: \_\_\_\_\_  
 Evaluator: \_\_\_\_\_ Gender: \_\_\_\_\_

**Rating Scale:****3 Above Expectation** (shows exceptional proficiency)**2 As Expected** (meets)**1 Below Expectation** (fails to meet)

Suctioning	Rating	
<b>I. Preparation</b>		
1. Check the patient's identification: a. Patient's name b. Patient's medical record number		
2. Check the patient's diagnosis.		
3. Select and gather all needed materials: Each item should be clean, ready for use and working: a. Stethoscope b. Sterile gloves c. Suction catheter d. Sterile water e. Sterile rinsing bottle f. Pulse oximeter g. Bag valve device		
5. Check functionality of equipment. Verify the suction machine is operational and set to the correct negative pressure range (typically 40 – 60mmHg neonates; 60 - 80 mmHg pediatrics).		
6. Perform hand hygiene Wash hands thoroughly for at least 20 seconds with soap and water, or use an alcohol-based hand sanitizer to ensure cleanliness.		
<b>II. Pre-Suctioning</b>		
1. Correctly identifies patient in the room/ward. a. Patient's name b. Patient's medical record number		
2. Introduces self and department		
3. Explain the procedure to patient/watcher/relatives: a. Purpose of treatment b. Duration of treatment c. Describe treatment as feeling of slowly pulling out of dirty mucus from airway creating a "slurpy/sipping" sound e. Confirm patient permission to perform treatment (if applicable)		
4. Pre-oxygenate Patient: If necessary, use a bag-valve mask to provide extra oxygen before starting the suctioning.		

5. Assess patient Perform baseline physiologic assessment: a. Auscultate to evaluate respiratory status (breath sounds) b. Oxygen saturation c. Heart rate d. Observe for any signs of respiratory distress: If noted, call the attending physician and nurse		
6. Position patient: Optimal, comfortable position		
<b>III. During Suctioning</b> 1. Detached tubing adaptor from the artificial airway. 2. Insert catheter through artificial airway up to carina level indicated by cough reflex. 3. Apply Suction: a. Before applying suction, withdraw the catheter 2cm above carina level. b. Apply suction by covering the thumb control valve and using the fingertip-roll technique simultaneously withdraw the catheter. Limit suction time to no more than 10 seconds.		
4. Monitor Patient. a. Assess the patient's response to therapy b. Monitors physiologic parameters: b.1 Auscultate to evaluate respiratory status (breath sounds) b.2 Oxygen saturation b.3 Heart rate c. Observe for any signs of respiratory distress or adverse reactions: c.1 If noted adverse reactions, STOP therapy. c.2 Call the attending physician and nurse.		
5. Repeat Therapy if Needed: Before repeating therapy, Hyper-oxygenate by 20% from current set FiO <sub>2</sub>		
<b>IV. Post-Suctioning</b> 1. Monitors physiologic parameters: a. Auscultate to evaluate respiratory status (breath sounds) b. Oxygen saturation c. Heart rate d. Dyspnea rating e. Observe for any signs of improvement or adverse reactions: If noted adverse reactions, call the attending physician and nurse.		
2. Re-position patient: Optimal, comfortable position		
3. Equipment care: a. Clean the nebulizer kit, airdry b. Put away devices used correctly c. Dispose of infectious waste correctly		
4. Perform hand hygiene:		

Wash hands thoroughly for at least 20 seconds with soap and water, or use an alcohol-based hand sanitizer to ensure cleanliness.		
5. Document: a. Record the given procedure b. Record the patient’s response to the treatment: b.1 improved physiologic parameters b.2 adverse effects c. Notifies attending physician for any recommendations or modifications to patient care plan if indicated		
<b>V. Safety and Hygiene</b> 1. Wear Personal Protective Equipment: a. Face Mask b. Gloves c. Gown		
2. Avoid under or over therapy: a. Frequency of therapy b. Duration of therapy		
3. Follow protocols on: a. In-line Suctioning b. Infection Control c. Patient Safety		

Printed Name and Signature of Evaluator

Printed Name and Signature of PRT

Table 3. Content Validity Index (CVI) of the CPCET Sections

CPCET Sections	CVI	Interpretation
Aerosol	.99	Acceptable
CPT	1	Acceptable
Suction	.99	Acceptable

Note. Experts (N = 5)

S-CVI Acceptability:  $CVI \geq 0.90$  (Polit & Beck, 2006);

I-CVI Acceptability: Expert = 3–5 (CVI = 1.00) (Lynn, 1986); Expert  $\geq 6$  (CVI  $\geq 0.78$ ) (Lynn, 1986)

Table 3. Based on the data gathered, Aerosol Therapy and Suction both with CVI of 0.99 have an Interpretation of Acceptable. The Analysis on the high CVI value of 0.99 indicated a very high level of agreement among experts on the validity of the items under these sections. Relatively, CPT (Chest Physiotherapy) with a CVI of 1.0 has an Interpretation of Acceptable. The Analysis on the perfect CVI of 1.0 indicated unanimous agreement among experts on the validity of the items under the CPT section. This meant that all items were deemed highly relevant without any discrepancies, reflected a strong content validity.

Table 4. Inter-rater Reliability of the CPCET Evaluators using Cohen’s Kappa.

Category	Observed Agreement (PoP_o)	Expected Agreement (PeP_e)	Cohen's Kappa ( $\kappa$ )	Interpretation

<b>Aerosol Therapy</b>	0.867	0.769	0.424	Moderate Agreement
<b>Chest Physiotherapy</b>	0.783	0.660	0.362	Fair Agreement
<b>Suction</b>	0.904	0.826	0.448	Moderate Agreement

Note. Fleiss' Kappa ( $\kappa$ ): <0.00 (poor); 0.00–0.20 (slight); 0.21–0.40 (fair); 0.41–0.60 (moderate);

0.61–0.80 (substantial);  $\geq 0.81$  (almost perfect) (Landis & Koch, 1977)

Table 4. Aerosol Therapy ( $\kappa=0.424$ \kappa = 0.424) and In-Line Suctioning ( $\kappa=0.424$ \kappa = 0.424) demonstrated moderate agreement, suggested reasonable consistency in ratings between raters but with room for improvement. Chest Physiotherapy ( $\kappa=0.362$ \kappa = 0.362) showed fair agreement, indicated less consistency in evaluations and potential enhancement of rater training.

## DISCUSSION

The findings of the study highlighted the current practice, challenges, barriers in evaluating competency giving emphasis on the significant progress made in the development of the procedural competency evaluation for pediatric respiratory therapists. The current practices (Table 1) reflect a structured approach, with frequent evaluations predominantly conducted on a monthly or quarterly evaluations aligned with the regular competency evaluations. (Clark et al, 2022). The methods of evaluation like the use of direct observation, structured checklists and patient variability indicates a strong focus on clinical practical skills and measurable outcome aligned with the practical, hands-on training and structured evaluation methods. (Barnes et al, 2024) The senior respiratory therapists and supervisors/managers are key evaluators, ensuring skilled oversight, while comprehensive criteria addressing safety, equipment use, technique, and communication further reinforce the effectiveness of evaluations tangible to the experienced practitioners conducting evaluations. (Barnes et al, 2024)

However, among the several challenges and limitations identified (Table 2) the absence of standardized tools aligning with the need for standardized instrument (Sreedharan et al, 2022) (Zaccagnini et al, 2023), time constraints during clinical practice and patient outcomes focused on leveraging capacity and addressing gaps in practice correlates with the challenges identified in the gathered data (Al Jabri et al, 2021) (Dubois et al, 2021) (Wu et al, 2022), insufficient feedback to therapists gave emphasis on feedback and skill improvement in the study correlates with the need for more detailed feedback (Lagoo et al, 2021), and reliance on subjective assessments indicated areas for improvement by reducing subjectivity thru standardized evaluation tool (Soffler et al, 2018) these opened avenues to health-care centered interventions. Introducing structured tools, improving feedback mechanisms, and implementing objective evaluation criteria can heighten the consistency and effectiveness of assessments.

The development of the CPCET on pulmonary toilette (Figure 3) is a big step toward addressing these challenges. The tool's five procedural sections—Preparation, Pre-therapy, during therapy, Post-therapy, and Safety and Hygiene—provide a comprehensive framework for evaluating clinical competency. The high content validity index (Table 3.4) demonstrated relevance and consistency, confirming the appropriateness of the tool's components for

assessment of competency. On a positive note, the fair to moderate agreement outcome from the inter-rater-reliability index (Table 4) posts a challenge on the rates capability on eliminating or minimizing subjective evaluations.

## CONCLUSIONS

This study addressed the need for a standardized evaluation tool, the CPCET in pulmonary toilette to assess the clinical performance of pediatric respiratory therapists ensuring pulmonary toilette is performed safely, effectively, with ease or minimal discomfort to the patient. This evaluation tool assures the pediatric respiratory therapists are proficient and well-equipped to provide high-quality patient care, elevating safety to both patients and the workplace.

The findings demonstrated the utility of the developed CPCET in establishing a standardized framework for competency evaluation, bridged the gaps that were identified as current practice, challenges and barriers such as elimination of subjective assessments and insufficient feedback, fair and consistent evaluations, capabilities of raters ultimately contributing to enhanced clinical procedural competency, improved patient care outcomes and boost the morale of the healthcare workers. The high reliability index could be a guideline for training assessment and continuous professional development among healthcare workers. The inter-rater reliability fair to moderate agreement pitched on designing a trainers training program.

Finally, as an upper middle-income country, no excuses that the standards of care pertaining to health delivery system should be compromised. The principles of clinical ethics and their application to clinical practice is inevitable therefore as a rule of thumb maleficence – do no harm is a joint responsibility of the healthcare institution and healthcare workers to attain the best health outcome for our patients and standardization of clinical practice across all healthcare professions is imperative.

Specifically future research can focus on:

1. Evaluating the effectiveness on the implementation of the developed CPCET on pulmonary toilette among respiratory therapists.
2. Developing a constructive patients' feedback on pulmonary toilette among respiratory therapists.
3. Develop CPCET on supportive interventions as mechanical ventilation and pulmonary diagnostics among respiratory therapists.
4. The impact on the conduct of regular calibration sessions and evaluators training to clinical and education trainers.

Exploring these domains can lead to the effectiveness competency evaluations, high standards of care, patient safety, and continuous professional development for healthcare providers.

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