Validation of a Self-Assessment Tool

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Background & Purpose
Simulation based learning experiences (SBLEs) offer student/instructor evaluation of clinical skills pre/post Preliminary Analysis to Develop Construct Validity

SBLEs provide a safe environment to develop proficiency in specific skills, situational learning like the intensive care unit (ICU), and to incorporate reflection to enhance learning. There are currently limited tools to assess physical therapy students’ perception of preparation for readiness for integration of simulated-based learning experiences (SBLEs) into practice and only moderate level of evidence to support the validity of these tools. The current tool was created and modeled from the competency based structure of the Division of Physical Therapy at Emory University as well as adapting from scales used for medical, physician assistants, and nursing students. The primary purpose of this mixed-method study is to validate the responses of a tool which was developed for student self-assessment of clinical skills following a SBLE prior to entering into an integrated or terminal clinical education experience. Combining qualitative and quantitative data will provide a deeper understanding of student self-reflection versus only survey results.

Methods
Students enrolled in the Advanced Acute Care Elective (AAACE – DPT 961) and the General Medical Conditions (GMC – DPT 755) course who gave consent to utilize completed surveys after each SBLE will be included in this study. The student survey results were uploaded to CANVAS learning platform as part of their required coursework. The surveys were then downloaded to One Drive, deidentified, and aggregated by first year and third year students. Factor analysis was used to evaluate patterns of correlations to assess construct validity of the responses. Cronbach’s Alpha was used to assess internal consistency of the instrument. Quantitative data were analyzed with SPSS v28. In addition to quantitative analysis of the survey, students were asked to volunteer for a recorded focus panel via Zoom to better understand their perception of the benefit of the survey tool and if the tool was a useful aid in self-reflection of their preparedness for clinical practice. The focus panel was held after completion of the courses so there was no perception of bias in grading for the course.

Focus Panel Question Categories:
1. Description of Likert scale
2. Comprehensive content
3. Tool as an aid

Likert Scale:
I am able to complete task but hesitated and felt I needed to ask for assistance
I am able to complete task without any assistance and feel well prepared
I am able to complete task with minimal assistance
I am able to complete task with direct assistance
I am able to complete task without assistance

Tool Development Timeline
Spring 2013
Developed original tool for simultaneous student/instructor evaluation of clinical skills pre/post Cardiopulmonary SBLE DPT 1
Spring 2014
Presented: Prospective, Observational, Longitudinal, Single Sample, Pre/Post Test (IRB 000817)
Fall 2014
Adapted tool for DPT 3 intensive Simulation Course
Fall 2014 – Present
Utilize tool after all SBLEs – DPT 1/DPT 3
Spring 2021
WHEA Fellowship in Educational Scholarship: Project – Validate Constructs of Tool
2022-2023
Preliminary Analysis to Develop Construct Validity
Collected 300 Surveys
Focus Panels (DPT 3/DPT 3) (IRB 0003778)

Tool Constructs/Categories:
1. Preparation Before Entering Patient Room
2. Look/Listen/Feel
3. Hemodynamics – Vital Signs – Cardiovascular
5. Hemodynamics – Central Monitoring
6. Auscultation – Heart
7. Auscultation – Lung
9. Function: Bed Mobility to Edge of Bed
10. Function: Edge of Bed to Transfer
11. Function: Transfer to Chair
12. Function: Gait
13. Wrapping Up Session

Results
In the preliminary sample there were 173 surveys with 152 deemed usable for the analysis from the DPT 1 cohort. The survey consisted of the 77 items and 13 hypothesized constructs. Table 1 shows two of the constructs that were highly supported by Factor Analysis and 2 that were more weakly supported. (High: Preparation Before Entering a Room & Gait; Low: Look/Listen/Feel; Heart Auscultation). Table 2 displays the results of Cronbach’s Alpha analysis showing the interrelatedness of the items within each construct.

<table>
<thead>
<tr>
<th>Section</th>
<th>Cronbach’s Alpha</th>
<th>% of Items</th>
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</thead>
<tbody>
<tr>
<td>Preparation Before Entering Patient Room</td>
<td>0.909</td>
<td>5</td>
</tr>
<tr>
<td>Look/Listen/Feel</td>
<td>0.764</td>
<td>8</td>
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<tr>
<td>Hemodynamics – Vital Signs – Cardiovascular</td>
<td>0.731</td>
<td>6</td>
</tr>
<tr>
<td>Hemodynamics – Vital Signs – Pulmonary/Oxygen Delivery System</td>
<td>0.804</td>
<td>5</td>
</tr>
<tr>
<td>Hemodynamics – Central Monitoring</td>
<td>0.867</td>
<td>4</td>
</tr>
<tr>
<td>Auscultation (Heart)</td>
<td>0.606</td>
<td>6</td>
</tr>
<tr>
<td>Auscultation (lung sounds)</td>
<td>0.900</td>
<td>4</td>
</tr>
<tr>
<td>Gross Evaluation: Review of Systems and Validated Functional Tool</td>
<td>0.857</td>
<td>2</td>
</tr>
<tr>
<td>Function: Bed Mobility to Edge of Bed</td>
<td>0.896</td>
<td>6</td>
</tr>
<tr>
<td>Function: Edge of Bed to Transfer</td>
<td>0.863</td>
<td>7</td>
</tr>
<tr>
<td>Function: Transfer to Chair</td>
<td>0.877</td>
<td>6</td>
</tr>
<tr>
<td>Function: Gait</td>
<td>0.866</td>
<td>5</td>
</tr>
<tr>
<td>Wrapping up Session</td>
<td>0.915</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Highly Correlated Constructs</th>
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<tbody>
<tr>
<td>Preparation Before Entering Room &amp; Gait</td>
</tr>
<tr>
<td>Look/Listen/Feel</td>
</tr>
<tr>
<td>Heart Auscultation</td>
</tr>
</tbody>
</table>

Conclusion
• Preliminary Survey Results
  • Demonstrated challenges to validating responses:
    • Incorrect markings by students on Likert Scale (x’s, 5’s)
    • Misplaced items within constructs
    • Potentially unclear wording of items
    • Items with little added value to constructs
• Preliminary Factor Analysis and Cronbach’s Alpha demonstrate positive results for at least 4 constructs
• Examples of 2 potential constructs supporting hypothesis and 2 not supporting
  • Preparation Before Entering Room and Gait (Support)
  • Look/Listen/Feel and Heart Auscultation (not Supporting)
• Need to edit constructs, wording, placement, and reevaluate
• Sample Size
  • Too small and results should be taken with caution
  • Further analysis of each item and constructs with a larger sample will direct how survey continues to evolve
• Highly Correlated Constructs
  • Transfer Edge of Bed to Stand and Transfer to Chair
  • Suggesting possibility of NOT 2 independent constructs
• Tool is Lengthy
  • ‘Item’ fatigue vs actual self-reflection
  • Incomplete surveys
• Focus Panel
  • DPT 3 students wanted continued guidance on how to use self-reflection for professional growth
  • Tool meant to be for self-reflection not faculty guided
  • DPT 1 students have not participated in focus panel

References
3. Roberts F, Cooper K. Effectiveness of high fidelity simulation versus low fidelity simulation on practical/clinical skill development in pre-registration physiotherapy students: a systematic review. JBI Database System Review Implement Rep 2012; 17(6):1229-1255

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