Validity of self-assessment using electronic clinical cases in continuing medical education

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Background: Self-assessment

- Continuing medical education (CME)
- Accuracy of self-assessment
- Electronic self-assessment
- Validity?
Context

- CME is mandatory in Iran for all practicing physicians
- eCME can improve accessibility, flexibility, responsiveness  (Cook et al. 2008; Davis et al. 2008)
- 25 credits per year and up to 50% through eCME programs
- Place: Iran, Isfahan
- Goal of CME: to improve antibiotic prescription regimen
- Participants: 48 GPs (About 4000 registered GPs in Isfahan province CME system)
- The program delivered via CME website
Aim: To analyze the validity of self-assessment test by electronic cases in measuring general practitioners’ diagnosing and management competences of common infectious disease in an outpatient setting.

Research question: To what extent does different validity evidence support electronic cases as a format of self-assessment activity in a CME context?
Overview of the study

Self-assessment

Entry
- Introduction, inform consent and registration

Self-assessment + feedback
- Influenza
- Sore throat
- Otitis Media
- Skin abscess
- Diarrhea

Survey + further reading
- GPs’ demographic data and their attitudes

Comparison
Comparing GPs’ performance on self-assessment and their previous actual prescriptions
Methods

- Designing the self-assessment cases + feedback

- Integrating of self-assessment in the LMS (eCME platform)
  - Moodle learning management system (LMS), https://moodle.org

- Checking validity evidence (Unified model of construct validity)
  - 5 forms of validity: content, response process, internal structure, correlations with other variables, consequences
### Steps in the electronic cases and the related competencies (adopted from Mucklow et al. 2012)

<table>
<thead>
<tr>
<th>Step</th>
<th>Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1: Make a diagnosis</strong></td>
<td>• Recognize important elements when assessing signs of infection</td>
</tr>
<tr>
<td><strong>Step 2: Establish a therapeutic approach and discuss it with patient</strong></td>
<td>• Recognize when not to prescribe antimicrobials, and when to use alternatives&lt;br&gt;• Educate patients (and family members) in when antibiotics are not required</td>
</tr>
<tr>
<td><strong>Step 3: Choose the drug and delivery format</strong></td>
<td>• Prescribe antimicrobials based on knowledge of the spectrum of activity&lt;br&gt;• Understand local microbial susceptibility patterns when considering empiric treatments&lt;br&gt;• Know how to select the appropriate antimicrobial&lt;br&gt;• Avoid the unnecessary use of broad-spectrum antimicrobials</td>
</tr>
</tbody>
</table>
Scenario

Submit bottom for each question

Specific feedback to each selected answer

Scroll down answers

General feedback for the question

four questions for case #1
Forms of validity evidence

Types of data related to each evidence source:

- **Content**: GPs’ perception about self-assessment
- **Response process**: Dishonest behavior
- **Internal structure**: Difficulty, discrimination, internal consistency indices
- **Relations with other variables**: Correlations with participants’ prescription outcome indicators obtained from the Provincial RUD Committee
- **Consequences**: Curiosity about antibiotic prescription

Results

We got 46 valid self-assessment results.

Content validity

<table>
<thead>
<tr>
<th>The GPs’ perceptions about the cases and the self-assessment</th>
<th>Totally agree</th>
<th>Agree</th>
<th>Unsure</th>
<th>Disagree</th>
<th>Totally disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>These cases are similar to my patient whom I visit every day in the office or clinic.</td>
<td>24% (11)</td>
<td>63% (29)</td>
<td>6.5% (3)</td>
<td>2.5% (1)</td>
<td>2.5% (1)</td>
</tr>
</tbody>
</table>

Cases reviewed by experts: infectious disease (2), pediatrics (2), clinical pharmacology (2) and gastroenterology (1)

Response process validity

Internal structure evidence

Checked with CITAS Excel spreadsheet extension

The mean item difficulty for the 16 questions was 0.62 and the mean item discrimination was 0.35. The overall reliability coefficient (KR-20) was 0.53.
Relations with other variables

- Total self-assessment score (61±13; min=38 max=88 out of 100)
- Participants’ prescription outcome indicators obtained from Provincial Rational Use of Drugs Committee
- No significant correlation detected

Consequences evidence

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<th>The GPs’ perceptions</th>
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<th>Disagree</th>
<th>Totally disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has participation in the educational program made you more curious to learn about antibiotic prescription</td>
<td>28.3%</td>
<td>54.3%</td>
<td>10.9%</td>
<td>4.3%</td>
<td>-</td>
</tr>
</tbody>
</table>
Discussion

- Using e-cases can improve accuracy of self-assessment of physicians, but we were unable to capture a direct link between the score obtained in the self-assessment e-cases and an indicator of practice behavior.

- Integrating the self-assessment e-cases with an immediate feedback was positively received by CME participants in our study.

- We recommend using self-assessment as a tool to personalize learning at course level or even at CME level.
Thank You

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