Background Information

Audience Response Systems (ARS) are a technology used in classrooms that consist of an input device controlled by the learner, a receiver, and a display device connected to the receiver (Cain & Robertson, 2008).

An affordable ARS was marketed in 1999 and by 2003 it began to have widespread use in post secondary institutions (Abrahamson, 2006; Kay & LeSage, 2009).

Health professions training programs have increasingly implemented ARS.

To date there have been no systematic reviews evaluating the effects of ARS in health professions training programs despite increasing number of studies in this field.

Review Characteristics

This review protocol was prospectively registered with BEME (see flow diagram).

Total number of participants involved in the included trials reviewed was 2,637.

The 21 included trials describe undergraduate (13), graduate (6), and professional (2) education in the fields of medicine, nursing, pharmacy, veterinary medicine and dentistry.

Kirkpatrick’s learning outcomes were used to categorize and evaluate each trial (Kirkpatrick, 2006). All 21 trials used to categorize and evaluate each study involved in the included form to full texts: 2 independent reviewers.

Applicability to participation included in the included form to full texts: 2 independent reviewers.

Assessment of methodological quality

Data extraction: Data extraction: 2 independent reviewers + cross check.

Data synthesis: Data extraction: 2 independent reviewers + cross check.

Type of study

<table>
<thead>
<tr>
<th>Common types of bias</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Randomized controlled trials</td>
<td>9</td>
</tr>
<tr>
<td>Cohorts</td>
<td>10</td>
</tr>
<tr>
<td>Non-randomized controlled trials</td>
<td>2</td>
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</tbody>
</table>

Assessment of methodological quality

The Effects of Audience Response Systems on Learning Outcomes in Health Professions Education:

A Best Evidence Medical Education (BEME) Systematic Review

Cody Nelson, Lisa Hartling, Sandy Campbell and Anna E. Oswald

Faculty of Medicine and Dentistry

Results

• Learner reaction to the ARS was nearly all positive.

• The RCTs showed no significant difference between groups in either immediate or long-term knowledge scores.

• The non-randomised studies demonstrated a significant difference favouring ARS for both immediate and long term knowledge scores; however, the latter analysis was based on only one study.

• The most significant impact was observed when ARS was compared to non-interactive teaching methods.

Conclusions

The impact of ARS on knowledge based outcomes include both positive and neutral findings. This review provides evidence to suggest the effectiveness of ARS in improving learning outcomes.