The Efficacy of Mobile Health Interventions Used to Manage Acute or Chronic Pain: A Systematic Review


Introduction
- Pain affects ~50 million adults.
- The financial burden of pain in the U.S. is $560 - $635 billion per year.
- There are 300 pain-related mHealth apps.
- Apps are cost-effective strategies to self-manage and track pain.

Research Questions
1. What is the efficacy of mHealth apps on persons with pain?
2. What components of mHealth apps are used to manage acute and/or chronic pain?

Methods
- PRISMA-compliant systematic review
- Joanna Briggs Institute appraisal tools
- Search included 5 databases
- 2 independent reviewers
- Data abstracted:
  - Study characteristics
  - Participant characteristics
  - Intervention characteristics
  - App functionality
  - Pain-related measures and outcomes

Results
- Search yielded 4,959 articles
- 162 full texts reviewed
- 5 articles were deemed eligible
- 4 of the 5 were feasibility/pilot studies
- Abstracted data varied across studies

Main Findings
- 2 of the 5 studies reported significant pain-related outcomes.
- Heterogeneity across studies limited our ability to compare outcomes.
- App components (# of articles):
  - Pain assessment (5)
  - Education (3)
  - Decision support (1)
  - Reminders (3)
  - Communication (4)
- Quality of evidence (# of articles):
  - Low (1)
  - Moderate (3)
  - High (1)

Conclusions and Next Steps
- Emerging Field of Research
  - More research is needed surrounding the efficacy of pain-related mHealth apps and their components
- Potential Consumer & Clinical Benefits
  - More research is needed to understand the role of mHealth apps in pain management
  - Several opportunities for nurses to support consumers’ self-management of pain

Table 1. Eligibility Criteria

<table>
<thead>
<tr>
<th>PICOT Category</th>
<th>Inclusion Criteria</th>
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<tbody>
<tr>
<td>Population</td>
<td>Participants receiving an mHealth intervention in the United States</td>
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<tr>
<td>Intervention</td>
<td>mHealth application (mobile and wireless devices to improve health outcomes, healthcare services, and health research)</td>
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<td>Comparison</td>
<td>Any comparison, including no treatment</td>
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<tr>
<td>Outcomes</td>
<td>Pain intensity (magnitude of pain experienced)</td>
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<td>Types of studies</td>
<td>Randomized and non-randomized studies published since 2010</td>
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Table 2. App Intervention Characteristics & Pain-Related Measures and Outcomes

<table>
<thead>
<tr>
<th>Study Author, Year</th>
<th>Application Designer</th>
<th>Application Component</th>
<th>Pain Scale</th>
<th>Significant Outcomes?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bakshi et al., 2017</td>
<td>Researcher</td>
<td>Pain assessment: Yes Education: No Decision support: No Reminders: Yes Communication: Yes</td>
<td>Numerical rating scale (0–10)</td>
<td>No</td>
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<tr>
<td>Fortier et al., 2016</td>
<td>Researcher</td>
<td>Pain assessment: Yes Education: Yes Decision support: No Reminders: No Communication: Yes</td>
<td>Adolescent Pediatric Pain Tool (word-graphic rating scale)</td>
<td>No</td>
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<tr>
<td>Irvine et al., 2015</td>
<td>Researcher</td>
<td>Pain assessment: Yes Education: Yes Decision support: No Reminders: Yes Communication: No</td>
<td>Adaptation of Wong-Baker FACES</td>
<td>Yes</td>
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<tr>
<td>Jamison et al., 2018</td>
<td>Researcher</td>
<td>Pain assessment: Yes Education: Yes Decision support: No Reminders: Yes Communication: No</td>
<td>Brief Pain Inventory (visual analogue scale, 1–10)</td>
<td>Yes</td>
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<tr>
<td>Mollard &amp; Michaud, 2018</td>
<td>Commercial Developers</td>
<td>Pain assessment: Yes Education: No Decision support: No Reminders: No Communication: Yes</td>
<td>Visual analogue scale (0–10)</td>
<td>No</td>
</tr>
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Acknowledgements