Role of Mobile App Reminders in Prompting Memory Strategies in Medication Adherence

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Background

- Non-adherence to medication causes between 33% and 69% of medication-related hospitalizations and up to $100 million in annual health care costs (Osterberg & Blaschke, 2005)
- Routinization of “living with the disease” into daily patterns of behavior
- Increased adherence in asthma patients who place inhaler next to toothbrush
- Teenagers who received text message reminders gave high ratings for ease of use and usefulness, but didn’t show much improvement over baseline (Dayer, Heldenbrand, & Anderson, 2013)

- Previous mobile reminders address forgetfulness but not synchronization or memory cues

Method

6 Rutgers University students participated voluntarily and for monetary compensation in single-blind control design.

- Experiment takes place over 7 day period
- Each participant brings home a bottle filled with 21 vitamin C tablets
- Unique barcode pasted on each bottle
- Asked to take one vitamin during three dosage periods each day based on meal times
- Asked to keep a meal log recording times meals were taken
- Post-lab questionnaire draws from beliefs about medication adherence, smartphone usage, and strategies developed over the week

I. Control group

- Participants allowed to keep daily records, but asked not to use electronic reminders

II. Alarm with barcode scanning function

- Participants asked to download app called Barcodealarm
- Alarm will not shut off until participant scans bottle with phone

Results

Sample Post-Experiment Questions

<table>
<thead>
<tr>
<th>Control</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>84.12%</td>
<td>100.00%</td>
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- Control participants missed 2-4 dosage periods
- Alarm participants each missed none

Research Questions

1.) Are mobile app alarms effective in reminding patients to take medication?

2.) How do mobile health alarms provide context for patients to form successful memory cues?

Conclusions

- Control group cited similar reasons as patients for missing dosage periods
- Same issue that arises in diabetic patients
- Strategies developed by barcode group introduced same thought process and reasoning as originally hypothesized
- Memory cues can influence user’s recall narrative (Howarth & Hendry, 2013)

Future Directions

- Longer periods of study
- Investigate effects after Barcodealarm app is stopped: do patients continue to use strategies?
- Use alarm apps without barcode function

References


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