

Mobile Health Apps: Can Behaviour Be Changed?

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Background

- There is an opportunity to use mobile health apps to change behaviour relating to health.^[1]
- There are 93 identified Behaviour Change Techniques (BCTs).
- 7 respiratory apps were selected to determine which BCTs were used.

Methods

- Step 1** • Develop a Behaviour Change Technique Taxonomy (BCTT) Study Protocol
- Step 2** • Identify 7 Respiratory Apps
- Step 3** • BCT Training for Coders
- Step 4** • Code Apps and Assess Inter-Reliability
- Step 5** • Develop Recommendations for the Redesign of the Apps

Figure 1: Example of Online Questionnaire

2. Feedback and Monitoring

2.1 Monitoring of behavior by others without feedback
Observe or record behavior with the person's knowledge as part of a behavior change strategy.
☐ 0 ☐ 1 ☐ 2 ☐ Modifier for other

2.2 Feedback on behavior
Monitor and provide informative or evaluative feedback on performance of the behavior (e.g. form, frequency, duration, intensity)
☐ 0 ☐ 1 ☐ 2 ☐ Modifier for other

2.3 Self-monitoring of behavior
Establish a method for the person to monitor and record their behavior(s) as part of a behavior change strategy.
☐ 0 ☐ 1 ☐ 2

2.4 Self-monitoring of outcome of behavior(s)
Establish a method for the person to monitor and record the outcome(s) of their behavior as part of a behavior change strategy.
☐ 0 ☐ 1 ☐ 2

2.5 Monitoring of outcome(s) of behavior by others without feedback
Observe or record outcomes of behavior with the person's knowledge as part of a behavior change strategy
☐ 0 ☐ 1 ☐ 2 ☐ Modifier for other

Results

- BCTs were not demonstrated in majority of the apps, instead most focused on data collection.
- There was not a good selection of apps to analyze regarding respiratory diseases.
- 18 BCTs were identified within the apps.
- There is an opportunity to improve the current apps to change behaviour and increase usability.

Figure 2: BCTs Demonstrated by Respiratory Apps^[2]



Discussion & Conclusion

- 10 of the 17 most common BCTs were randomly chosen to demonstrate the opportunity for improvement in respiratory apps. In redesigning an app for respiratory behaviour change, the following are examples:

Behavioural Rehearsal

- A video that demonstrates a person doing a breathing exercise that prompts the user to rehearse the breathing exercise.

Feedback on Behaviour

- Provides feedback on the user's performance in using an inhaler as per the suppliers' instructions.

Health Consequences

- Provides information about the health consequences of not taking their respiratory medication, such as an inhaler.

Self Monitoring of Behaviour

- Asks the user to record, in a daily diary, their completion of their peak flow.

Goal Setting (Behaviour)

- Prompt user to set a respiratory goal such as, doing 3 breathing techniques everyday to make respiratory distress less likely.

Review Behaviour Goals

- Goals are displayed in a graph that compares the user's performance to their goals. The user is then asked whether they would like to modify their goals.

Social Support General

- The user is connected to an online support group for patients with asthma to talk about how to reduce stress.

Material Reward (Behaviour)

- A credit is deposited every month when breathing exercise goals are achieved.

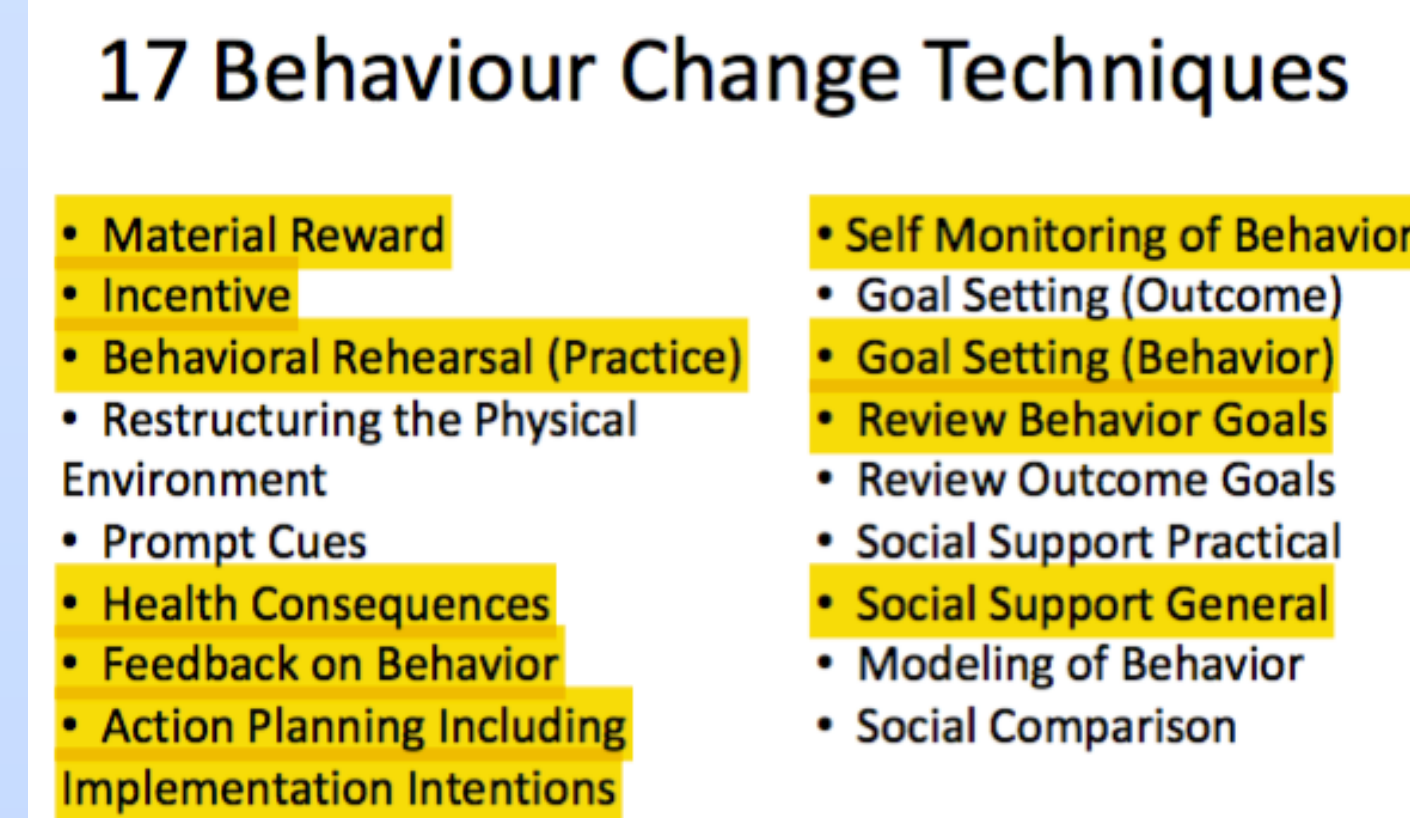
Incentive

- A notification appears telling users that completion of XX more breathing exercises this week will result in receiving their material reward.

Action Planning

- Triggers are identified that could impact respiratory health. Suggestions for avoiding or minimizing their triggers are supplied, which the user incorporates into a daily management plan. For example, if the air quality is poor today, the app could provide different options on how to approach the activities for the day.

Figure 3: 17 Most Common BCTs^[3]



Future Work

- Incorporate the BCTs into respiratory apps.
- Test to determine if the BCTs incorporated into apps changes the users behaviour and if users continue using the app.

Figure 4: Prototypes of the BCTs Social Support (General), Review Behaviour Goals and Incentive



All phone prototype images were retrieved from [Pexels](https://www.pexels.com/), [Shutterstock](https://www.shutterstock.com/), and [Getty Images](https://www.gettyimages.com/), which were labeled for reuse or are of my own creation.

References

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