Correlates of healthy lifestyle beliefs and behaviors in parents of overweight/obese preschoolers before and after a CBT intervention

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Conflict of Interest

- L Militello reports no financial interest or COI
- BM Melnyk owns COPE2Thrive LLC that disseminates the COPE program
- E Hekler reports no financial interest or COI
- L Small reports no financial interest or COI
- D Jacobson reports no financial interest or COI
Objectives

✓ To highlight the interconnected relationships among parental thoughts, feelings, and healthy lifestyle behaviors

✓ To identify the potential role of mobile messaging support as an adjunct to a CBT intervention (EMI and EMA)
Childhood Obesity

• If rates of childhood obesity are not reversed, one out of three boys and two out of five girls born after 2000 will suffer from type 2 diabetes at some point in their lives.
Primary Care

• Primary care interventions are urgently needed to improve healthy lifestyle behaviors in families
Parental Influence

• The most influential individuals in a child’s life are the parents, with a unique role to leverage behavior change in children.
Healthy Lifestyles

• Individuals who cognitively appraise healthy lifestyle choices as more difficult are less likely to have the intentions to make healthy lifestyle choices and engage in healthy lifestyle behaviors
mHealth

• Parents desire personalized information relevant to their child and are enthusiastic towards receiving SMS endorsed by their child’s primary care provider
Purpose

• Secondary data analysis to assess correlations among study variables (healthy lifestyle beliefs, perceived difficulty, and healthy lifestyle behaviors) in parents of OW/OB children before and after a cognitive-behavioral therapy based intervention

  – The first specific aim was to determine correlates among parental healthy lifestyle beliefs, perceived difficulty, and healthy lifestyle behaviors as posited by the theory

  – The second specific aim focused on determining if the parent’s level of cognitive beliefs and perceived difficulty to engage in healthy lifestyle behaviors correlated with the text messaging cognitive behavioral support
Conceptual Model

- Beck’s Cognitive Theory
- Fogg’s Behavior Model
## Methods

<table>
<thead>
<tr>
<th>Intervention Implementation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face to face clinic visit</td>
<td>Discussion covering educational information and CBSB</td>
</tr>
<tr>
<td>Reminders</td>
<td>Manual and/or Audio</td>
</tr>
<tr>
<td>Reinforcements</td>
<td>Homework and practice</td>
</tr>
<tr>
<td>Triggers</td>
<td>SMS; tailored and static</td>
</tr>
</tbody>
</table>
### TEXT2COPE Intervention Program CBSB Content

<table>
<thead>
<tr>
<th>TEXT2COPE Intervention Program CBSB Content</th>
<th>Session Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy lifestyles and the thinking, feeling, behaving triangle; basic recommendations for nutrition &amp; physical activity in preschoolers; goal setting</td>
<td>Week 1 Face-to-face AND text messaging; manualized content</td>
</tr>
<tr>
<td>Information on physical activity and nutrition, including appropriate portion sizes, healthy eating and food groups</td>
<td>Week 2 Self-study AND text messaging</td>
</tr>
<tr>
<td>Barriers to goal progression and overcoming barriers through problem solving and cue recognition</td>
<td>Week 3 Face-to-face AND text messaging</td>
</tr>
<tr>
<td>Positive thinking and self talk related to healthy lifestyle behaviors</td>
<td>Week 4 Self-study AND text messaging</td>
</tr>
<tr>
<td>Cognitive reframing - with an emphasis on the physical and emotional responses to stress and how positive beliefs can help to reframe cognitions and promote positive coping.</td>
<td>Week 5 Face-to-face AND text messaging</td>
</tr>
<tr>
<td>Effective communication, stress and coping.</td>
<td>Week 6 Self-study AND text messaging</td>
</tr>
<tr>
<td>Putting it all together; integration of knowledge and skills</td>
<td>Week 7 Face-to-face</td>
</tr>
</tbody>
</table>

*Adapted from Melnyk’s COPE Healthy Lifestyles TEEN intervention and Small’s PLAY intervention*
Sample of Immediate Automated SMS Feedback Generated from TEXT2COPE SMS Library

**TEXT2COPE Static SMS:** “PARENT NAME — Did you give your child veggies at dinner tonight? Please reply with Y or N”

<table>
<thead>
<tr>
<th>Parent replied with N</th>
<th>Parent replied with Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>New habits take time stick to your goals; believe that you can do this.</td>
<td>Good job! Continue to help your child by setting a good example!</td>
</tr>
<tr>
<td>Keep trying, little-by-little, step-by-step.</td>
<td>Be proud of yourself, you’re getting your child off to a healthy start!</td>
</tr>
<tr>
<td>Fear of new foods is common in children — try offering the same vegetable many times in different ways.</td>
<td>You’re on your way. Here are some more snack ideas — vegetable sticks and fruit wedges.</td>
</tr>
</tbody>
</table>
Methods

Recruitment/Sample

Total eligible preschool aged children with dx of QW/OB from 3 primary care sites N=52

Unable to reach, left msg x3 with no response, or wrong number N=17

Refused/not interested (too busy, newborn at home, sick other child) N=11

Only Spanish speaking N=9

Final enrolled N=15
# Measures

## Data Collection Summary for Families with OW/OB Preschoolers

<table>
<thead>
<tr>
<th>Construct</th>
<th>Instrument</th>
<th>Validity</th>
<th>Reliability</th>
<th>Data Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td>Demographic Questionnaire</td>
<td>NA</td>
<td>T1</td>
<td></td>
</tr>
<tr>
<td>Healthy Lifestyles Beliefs Scale</td>
<td>Healthy Lifestyles Beliefs Scale</td>
<td>Content, Construct</td>
<td>.86</td>
<td>T1, T2</td>
</tr>
<tr>
<td>Perceived Difficulty</td>
<td>Perceived Difficulty Scale</td>
<td>Content, Construct</td>
<td>.92</td>
<td>T1, T2</td>
</tr>
<tr>
<td>Healthy Lifestyle Behaviors</td>
<td>Healthy Lifestyle Behaviors Scale</td>
<td>Content, Construct</td>
<td>.78</td>
<td>T1, T2</td>
</tr>
</tbody>
</table>
Statistical Analyses

• Assumptions of correlation tests were first verified
• Spearman’s $r$ was used to determine association between study variables reported as Spearman’s $r$ correlation coefficient ($r_s$)
Results

## Demographics

<table>
<thead>
<tr>
<th>Parent Characteristics at Baseline (n=13)</th>
<th>Child Characteristics at Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency (Percent)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>18-24 years</td>
<td>3 (23.1%)</td>
</tr>
<tr>
<td>25-34 years</td>
<td>5 (38.5%)</td>
</tr>
<tr>
<td>35-44 years</td>
<td>5 (38.5%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>female</td>
<td>13 (100%)</td>
</tr>
<tr>
<td>male</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>4 (30.8%)</td>
</tr>
<tr>
<td>African American</td>
<td>1 (7.7%)</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>8 (61.5%)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Less than HS</td>
<td>1 (7.7%)</td>
</tr>
<tr>
<td>GED/HS</td>
<td>5 (38.5%)</td>
</tr>
<tr>
<td>Some college</td>
<td>3 (23.1%)</td>
</tr>
<tr>
<td>4-yr. college</td>
<td>3 (23.1%)</td>
</tr>
<tr>
<td>Masters degree</td>
<td>1 (7.7%)</td>
</tr>
<tr>
<td>Annual Household Income</td>
<td></td>
</tr>
<tr>
<td>Less than $10K</td>
<td>5 (38.5%)</td>
</tr>
<tr>
<td>$10K-$19K</td>
<td>4 (30.8%)</td>
</tr>
<tr>
<td>$20-$29K</td>
<td>1 (7.7%)</td>
</tr>
<tr>
<td>$40-$49K</td>
<td>1 (7.7%)</td>
</tr>
<tr>
<td>$70K or more</td>
<td>2 (15.4%)</td>
</tr>
<tr>
<td>Public Assistance</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>11 (84.6%)</td>
</tr>
<tr>
<td>No</td>
<td>2 (15.4%)</td>
</tr>
</tbody>
</table>
Results

**Aim 1.** To determine correlates among parental healthy lifestyle beliefs, perceived difficulty, and behaviors as posited by the theory

<table>
<thead>
<tr>
<th>Baseline Variable</th>
<th>Beliefs</th>
<th>Perceived Difficulty</th>
<th>Behaviors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parental Healthy Lifestyle Beliefs</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Difficulty</td>
<td>.598*</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Parental Healthy Lifestyle Behaviors</td>
<td>.545*</td>
<td>.686**</td>
<td>1.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Posttest Variable</th>
<th>Beliefs</th>
<th>Perceived Difficulty</th>
<th>Behaviors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy Lifestyle Beliefs</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Difficulty</td>
<td>.696**</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Healthy Lifestyle Behaviors</td>
<td>.653**</td>
<td>.722**</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*Note. Higher scores on Perceived Difficulty scale indicate less perceived difficulty (easier to do)*

*Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)
Results

Aim 2. To determine if the parent’s level of cognitive beliefs and perceived difficulty to engage in healthy lifestyle behaviors correlated with the text messaging cognitive behavioral support.

- A total of 291 SMS were sent to the parents
  - combined 138-tailored message
  - 105 static messages
  - 53 automated feedback messages

- Frequency (number of messages sent)
  - SMS varied from seven to 39, with the mean (M) number of messages sent 22.31 ±9.47
  - Tailored messages ranged from three to 20 (M=10.62 ± 5.45)
  - Static messages sent to each participant ranged from 4 to 12 (M=8.00, SD=2.42)
Results

Aim 2. To determine if the parent’s level of cognitive beliefs and perceived difficulty to engage in healthy lifestyle behaviors correlated with the text messaging cognitive behavioral support.

- Neither the total number of SMS sent, nor the total number of tailored SMS sent associated with study variables.

- Response to static messages was significantly inversely associated with both belief scores ($r_s = -0.522, p<.05$) and perceived difficulty scores ($r_s = -0.677, p<.01$)
Discussion

• A diagnosis of OW/OB during the preschool years may be one of the first indicators of a family in need of support. Previous research indicates the likelihood that when children need help, parents do as well

• As posited by Beck’s (Beck, Rush, Shaw, & Emery, 1979) CT, findings from this study support the interconnections between the parents’ thoughts, feelings, and actions

• Collectively, these findings suggest targeting cognitive beliefs is key strategy for behavior change interventions
Discussion

• Mobile triggers from the TEXT2COPE program were timed to disrupt the habitual repetition of negative schemas and past actions reinforced over time

• Findings suggest that as parental beliefs became stronger through cognitive behavioral skills building and tailored SMS, their need for general support via SMS lessened
Implications for Practice

• Frequency of OW/OB preschoolers concerning
  – Lack of readily available treatment options
  – Need for strong research evidence conducted in this population
  – Utilizing primary care setting is underscored

• Cognitive Behaviors Skills Building
  – Help parents identify and over time reframing the core beliefs to be more positive
  – Some parents would focus on the actual habit (i.e., exercise),
  – Some would focus on the actual skill (i.e., problem-solving, goal-setting)

• Synergize/support clinical efforts with technology
  – Can SMS be incorporated into EHR
Future Directions

• A pilot randomized controlled trial
• Subsequent exploration into real-life contexts if clinicians and parents adopt the intervention as practice
• A longitudinal design will also help to assess alert fatigue, feasibility and acceptability, behavior change, and anthropometric change over time
• Cost analysis warranted
Conclusion

• The extant gap in the research literature regarding preschool children and their parents is that there are no randomized controlled trials examining the effects of a cognitive behavioral therapy based intervention delivered in a primary care setting and facilitated with mobile messaging to support families with OW/OB preschoolers.

• When considering the frequency with which clinicians confront the problem of OW/OB preschoolers and the lack of available treatment options, the need for strong research evidence conducted in this population, in the primary care setting, is underscored.


References


References


