Disclosure to Participants

- Notice of Requirements For Successful Completion
  - Please refer to learning goals and objectives
  - Learners must attend the full activity and complete the evaluation in order to claim continuing education credits/hours

- Conflict of Interest (COI) and Financial Relationship Disclosures:
  - Presenter: Anastasia Albanese-O’Neill, PhD, ARNP, CDE – No COI/Financial Relationship to disclose

- Non-Endorsement of Products:
  - Accredited status does not imply endorsement by AADE, ANCC, ACPE or CDR of any commercial products displayed in conjunction with the educational activity

The Educational Needs of Fathers of Youth with Diabetes: A Mixed Methods Study

Diabetes Management

- Intensive therapy can reduce long-term complications (DCCT, 1994)
- Technological advances have provided more treatment options
  - Insulin pumps,
  - Continuous glucose monitors,
  - Integrated systems

Glycemic Control Declines During Adolescence

Source: T1D Exchange
Diabetes Self-Management Education
- Cornerstone of diabetes care
- Is requisite for effective diabetes management (Sullivan-Bolyai, 2004)
- Is provided in the clinical setting (Couch et al., 2008)

Where is Type 1 Diabetes managed?
- 525,600 minutes in a calendar year
- A patient with T1D spends about 200 of them in clinical appointments with diabetes care team

Fathers of children with diabetes
- Can contribute to improved quality of life and reduced disease burden for all family members, and reduced levels of depression in mothers (Wysocki & Gavin, 2006)
- One of the few modifiable familial factors linked to improved glycemic control (Berg et al., 2008; Butler et al., 2008)

Fathers and Diabetes Knowledge
- Fathers knowledge trails that of mothers (Johnson et al., 1982)
- Fathers lose knowledge more quickly than mothers (Hackett et al., 1989)
- Fathers often left out of research involving "parents" (Phares et al., 2005)
- Data from fathers and mothers rarely analyzed separately (Dashiff et al., 2008)

Fathers and Clinical Appointments
- Less likely to attend diabetes clinical visits (Markowitz et al., 2014)
- Diabetes Care Team's perception of fathers – “If dad attends, we are happy – if mom doesn't, we become concerned.” Boman et al., 2012)

Messaging to Fathers
- "Empower parents to be proactive in their child's care..."
Mobile Technology

- 64% of Americans are smartphone owners
  - Consistent across ethnicity
- Parents go online to find information about diabetes (Balkhi et al., 2015)
- Fewer than 1% of online apps have scientific evidence behind them (Quinn, 2014)

Purpose

To identify the diabetes-specific educational needs and technological preferences of fathers of youth with type 1 diabetes ages 6 to 17 years, and use that data to build a prototype mobile Web diabetes educational application.

Assumptions

Fathers of children with T1D have unmet educational needs that they are able to identify and describe, and these fathers have access to mobile technology and are willing to receive diabetes education via mobile interface.

Research Design

- Mixed Methods Study
  - Two online surveys
    - Demographic survey
    - Educational Needs (19 topical areas) and Technological Preferences
  - Semi-structured interview
  - Quantitative data analyzed with SPSS, v. 22
  - Qualitative data coded using nVivo 10

Sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (SD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of Father in years</td>
<td>47.7 (±8.5)</td>
<td>33 to 73 years</td>
</tr>
<tr>
<td>Age of Child in years</td>
<td>12.5 (±3.4)</td>
<td>6 to 17 years</td>
</tr>
<tr>
<td>Child’s Diabetes Duration in years</td>
<td>6.5 (±4.1)</td>
<td>1 to 15 years</td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$20,000 to $34,999</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>$35,000 to $49,999</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>$50,000 to $74,999</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>$75,000 to $99,999</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Greater than $100,000</td>
<td>67%</td>
<td></td>
</tr>
<tr>
<td>Employment Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed, Full-time</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>Employed, Part-time</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>Retired</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>10%</td>
<td></td>
</tr>
</tbody>
</table>
Technology Preferences

Use of Mobile Technology

Use of Other Technology

Is mobile education acceptable?

Is push technology acceptable?

Results

<table>
<thead>
<tr>
<th>Group</th>
<th>Average # Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>All participants, n = 30</td>
<td></td>
</tr>
<tr>
<td>Fathers with income &lt;$49,999, n = 3</td>
<td></td>
</tr>
<tr>
<td>Minority fathers, n = 4</td>
<td></td>
</tr>
</tbody>
</table>
Fathers of School Aged Children (6-12 years) versus Fathers of Teenagers (13-17 years)

A majority of participants who were fathers of school-aged children identified 8 of 19 topics as educational needs.

A majority of participants who were fathers of teens identified 17 of 19 topics as educational needs.

Pearson's Chi-Square Analysis

<table>
<thead>
<tr>
<th>Education Topic</th>
<th>13-17 years</th>
<th>6-12 years</th>
<th>X²</th>
<th>df</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes research</td>
<td>93%</td>
<td>56%</td>
<td>5.117</td>
<td>1</td>
<td>p &lt; 0.05</td>
</tr>
<tr>
<td>Taking care of my diabetes when my child is sick</td>
<td>70%</td>
<td>65%</td>
<td>0.022</td>
<td>1</td>
<td>p = 1.00</td>
</tr>
<tr>
<td>Information about continuous glucose monitors</td>
<td>90%</td>
<td>90%</td>
<td>0.000</td>
<td>1</td>
<td>p = 1.00</td>
</tr>
<tr>
<td>Managing ketones</td>
<td>67%</td>
<td>67%</td>
<td>0.000</td>
<td>1</td>
<td>p = 1.00</td>
</tr>
<tr>
<td>Information about insulin pumps</td>
<td>77%</td>
<td>70%</td>
<td>0.172</td>
<td>1</td>
<td>p = 0.68</td>
</tr>
<tr>
<td>Diabetes at school</td>
<td>57%</td>
<td>57%</td>
<td>0.000</td>
<td>1</td>
<td>p = 1.00</td>
</tr>
<tr>
<td>Hyperglycemia</td>
<td>53%</td>
<td>53%</td>
<td>0.000</td>
<td>1</td>
<td>p = 1.00</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>50%</td>
<td>50%</td>
<td>0.000</td>
<td>1</td>
<td>p = 1.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education Topic</th>
<th>Fathers of Teens (13-17 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finding help for diabetes challenges</td>
<td>100%</td>
</tr>
<tr>
<td>Diabetes research</td>
<td>100%</td>
</tr>
<tr>
<td>Diabetes and Nutrition</td>
<td>93%</td>
</tr>
<tr>
<td>Information about insulin pumps</td>
<td>79%</td>
</tr>
<tr>
<td>Carbohydrate Counting</td>
<td>64%</td>
</tr>
<tr>
<td>Why/how diabetes happens</td>
<td>64%</td>
</tr>
<tr>
<td>Self-monitoring of blood glucose</td>
<td>50%</td>
</tr>
<tr>
<td>Ordering diabetes supplies</td>
<td>50%</td>
</tr>
<tr>
<td>How insulin works</td>
<td>50%</td>
</tr>
</tbody>
</table>

Education Provided at Diagnosis and Residual Educational Needs

- Three patterns
  - Education provided to most, material mastered by most
  - Education NOT provided to most, material not mastered by most
  - Education provided to most, material not mastered by most

• Three patterns
  - Education provided to most, material mastered by most
  - Education NOT provided to most, material not mastered by most
  - Education provided to most, material not mastered by most
The effect of education received. The Majority:

<table>
<thead>
<tr>
<th>Received, No longer required</th>
<th>Didn't Receive, Still required</th>
<th>Received, Still required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Giving Insulin Injections</td>
<td>Diabetes research (p &lt; 0.01)</td>
<td>Diabetes and exercise (p = 0.8)</td>
</tr>
<tr>
<td>Using a Blood Glucose Meter</td>
<td>Information about continuous glucose monitors (p &lt; 0.01)</td>
<td>Calculating and adjusting insulin doses (p &gt; 0.6)</td>
</tr>
<tr>
<td>Self-monitoring Blood Glucose</td>
<td>Finding help for diabetes challenges (p &lt; 0.05)</td>
<td>Diabetes management on sick days (p = 1.0)</td>
</tr>
<tr>
<td>Carbohydrate Counting</td>
<td></td>
<td>Managing ketones (p &lt; 1.0)</td>
</tr>
<tr>
<td>Why/How Diabetes Happens</td>
<td>Diabetes and Nutrition (p &lt; 0.5)</td>
<td></td>
</tr>
<tr>
<td>How Insulin Works (p &lt; 0.05)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Qualitative Themes

<table>
<thead>
<tr>
<th>Value of Clinical Visits</th>
<th>Fears and Limitations Associated with T1D</th>
<th>Sources of Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online and Mobile Product Preferences</td>
<td>Diabetes-Specific Educational Needs</td>
<td></td>
</tr>
</tbody>
</table>

Participants’ Views on Clinical Visits

Limited perceived value in clinical visits

- “I think that the dads—they’re involved, too— even though we don’t go to all the doctor visits and stuff. I think because the doctor visits aren’t solution based. They’re just visits to see that you’re managing it.”

Limited perceived value in clinical visits

- M017: “We know how the appointments go. They’re going to download her pump. They’re going to test her blood sugar. They’re going to read her A1c...”
- Interviewer: “You’re not doing a lot of... education at appointments?”
- M017: “We’re not doing any.”

Hesitant to ask questions at clinical visits

- “Sometimes, if you go to a doctor, if you don’t know the right questions to ask, then you’re only gonna get the information that is being given to you. [Pause] Not that doctors talk down to you, but some are better at explaining things than others.”

Fear of Judgment at Clinical Visits

- “A computer isn’t going to pass judgment on what I don’t know, but it’s going to give me the answer that I need to know and want to know so that I can feel more confident. Yeah, that’s a lot better.”
mHealth and Diabetes Education

mHealth and Type 1 Diabetes
- mHealth interventions have shown positive preliminary results (Mulvaney et al., 2011)
- Most lack sufficient sample sizes or only explore feasibility and acceptability (Herbert et al., 2013)
- Most are not informed by clinical recommendations (Chomature et al., 2011)

Elements of Prototype Mobile Website
- Incorporates educational priorities and technological preferences of participants
- Optimized for mobile technology
- New content pushed to end-user at a frequency specified by the user
- YouTube interface for multimedia content
- Provision for Social Support (Facebook)

mDAD component sites

Additional Pages

Limitations
- Convenience Sample
  - Disproportionately high-income and college educated
Summary

- Participants found mobile delivery acceptable, in some cases preferable
- Participants had high levels of unmet diabetes-specific educational needs
- Participants are seeking education and skills training

Future Direction for mDAD

- Conduct a larger needs assessment
  - Recruitment targeting low income, minority and single fathers
- Refine and beta test mDAD: Mobile Diabetes Advice for Dads mobile web application

Acknowledgements

University of Florida
Jennifer Elder, PhD, RN, FAAN
Desmond Schatz, MD
Jay Bernhardt, PhD, MPH

Support of Support
James Franklin, UF Association of Academic
Fathership
Dept. of Pediatrics
Dept. of Health and Human Behavior

UF Qualitative Data Analysis Group
Christa Cook, PhD, RN
Mary Ellen Young, PhD, MPH, and
faculty and student members.

Office of Research Support
Dr. Cynthia Garvan, Patti Jamison,
Deborah MacDonald, Laurie Rinfret

Chick:
Diabetes Research Group, Diabetes Institute
Fathers of children with Type 1 diabetes and their families

Thank You!
Questions?