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Iterative development of a web-based intervention for families of young children with type 1 diabetes: DIPPer Academy

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Abstract

Objective: A new diagnosis of Type 1 diabetes mellitus (T1D) can be stressful for families as they are expected to learn a large amount of information regarding disease management and treatment in a short period of time. Currently, parents complete diabetes education at the time of diagnosis. However, this format may not be sustainable as rates of T1D climb. The current study aimed to develop an online platform to provide educational material in the form of video micro-lectures using an iterative, user-centered, design process.

Methods: In the first stage of development, parents of young children with T1D identified information they felt most important to their child's T1D care. In the second stage, healthcare providers contributed qualitative and quantitative feedback regarding the educational material and video mock-ups. The third stage involved parents of young children with T1D providing feedback on the completed video micro-lectures.

Results: Providers and parents reported that the videos were highly useful, important to T1D care, and the majority would recommend them to other parents.

Conclusions: The iterative design process used by the research team incorporated multiple perspectives and ultimately developed educational resources that were well-received by providers, researchers, and parents.

Implications for Impact Statement: This study used an iterative, user-centered design to develop a series of web-based videos for parents of young children with type 1 diabetes. Primary stakeholders, both healthcare providers and parents, described videos as highly important, useful, enjoyable, and would recommend these resources to others. Parents rated videos highly across a variety of presentations that ranged in development time and cost, indicating that researchers can feasibly and cost-effectively create web-based resources for parents.

Keywords

Type 1 diabetes; user-centered design; eHealth

Introduction

Diagnosis of type 1 diabetes (T1D) is a stressful and life-altering event that 17,900 youth under age 20 and their families experience each year (Mayer-Davis et al., 2017; Whittemore, Jaser, Chao, Jang, & Grey, 2012). Parents and children need to learn new T1D self-care information and behaviors quickly in order to manage blood glucose levels (Chiang, Kirkman, Laffel, & Peters, 2014). Self-care education includes instruction on checking blood glucose, carbohydrate counting, dosing insulin, and treating hypo- and hyperglycemia, and typically occurs in-hospital at time of diagnosis or during 1–2 outpatient classes shortly after diagnosis, with all other education taking place during quarterly diabetes clinic visits. However, learning during the new diagnosis period may be less effective due to the high levels of distress, depression, and anxiety often associated with a T1D diagnosis (Whittemore et al., 2012; Streisand et al., 2008). In fact, families who received inpatient T1D education had healthcare costs and healthcare utilization (e.g., hospitalizations, emergency care) that were 2.6 times greater than those who received education in an outpatient setting in the first year after diagnosis (Jasinski, Rodriguez-Monguio, Tonyushkina, & Allen, 2013). Additionally, most youth attend T1D clinic visits less than the recommended four times per year (average attendance is 2.9 visits per year; Markowitz, Volkeneing, & Laffel, 2014), limiting opportunities for ongoing education. Individuals who attend fewer clinic visits demonstrate worse glycemic control and are at increased risk for serious health complications (Markowitz et al., 2014). Finally, the majority of children 1–6 years old do not meet the current glycemic control target of < 7.5% (Wood et al., 2013), indicating a wide-spread need for additional education, monitoring, and resources outside of clinic to help families meet treatment goals.

For families of young children with T1D, unique developmental (e.g., highly insulin sensitive, limited communication) and behavioral (e.g., independence-seeking) challenges can make it harder to achieve adherence and glycemic targets and may necessitate ongoing targeted education (Hilliard, Monaghan, Cogen, & Streisand, 2011; Patton, Dolan, & Powers, 2006; Patton, Midyett, Dolan, & Powers, 2012; Powers et al., 2002; Streisand & Monaghan, 2014). Unfortunately, the incidence of T1D in children less than six-years-old is expected to double by 2020 (Patterson et al., 2009), while there is already a national shortage of board-certified pediatric endocrinologists (Lee, Davis, Menon, & Freed, 2008) and limited access to education and care in rural and hard-to-reach areas. As incidence rates increase, additional resources will be needed to provide education to an increasing number of families, and access to educational resources through an eHealth or web-based application could alleviate some of this burden on the healthcare system. While more in-depth intervention may still be indicated for families who struggle the most, eHealth resources that target typical families of a young child with T1D could offset burden of care and allow providers to focus on families with the greatest need.

eHealth and web-based applications provide an ideal opportunity for continuing education because they are low burden for families and medical providers, easily accessible and scalable, and can facilitate near real-time monitoring and feedback (Russell-Minda et al., 2009). Previous studies have shown it is feasible to develop eHealth and web-based applications to improve adolescent self-management of T1D (Cafazzo, Casselman,

Hamming, Katzman, & Palmert, 2012), implement a coping intervention for parents of children with T1D (Wysocki et al., 2017), and provide professional and peer support for parents of children with T1D (Boogerd et al., 2017). In addition, recent Pew Research Institute (2018) data show that over 97% of adults (18–49 year-olds) in the United States have internet access and most adults own a smartphone (77%), computer (73%), and/or tablet (53%; Pew Research Institute, Feb. 5, 2018). Thus, it is highly likely that families of young children with T1D own and regularly use the technology needed to access online resources, and thus might benefit from eHealth or web-based applications specific to parenting a young child with T1D.

To date, eHealth and web-based applications that specifically target families of young children with T1D have received limited attention. This may be due in part to barriers like high-cost associated with the development of engaging online material and user disengagement over time (Wu, Steele, Connelly, Palermo, & Ritterband, 2014; Eysenbach, 2005). To overcome these limitations, one suggestion is to employ a user-centered design. User-centered design “involves consideration of the user at every stage of the design process” to ensure that all intervention materials focus on patient needs (McCurdie et al., 2012, p. 50). User-centered designs use multiple steps to achieve a more accurate assessment of user requirements, which ultimately can lead to improved intervention quality and greater acceptance and use (Dabbs et al., 2009).

Therefore, the intent of this study was to design a web-based educational intervention for typical families of young children with T1D using an iterative, user-centered design process that included steps to assess user needs, translate key concepts into prototypes, and then evaluate and refine prototypes based on stakeholder usability testing and feedback (McCurdie et al., 2012). This iterative process elicited perspectives from multiple stakeholders (researchers, providers, and parents) to maximize content accuracy, material usability, and tailoring to parents of young children with T1D. In this manuscript, the researchers describe parent and provider perspectives, lessons learned from this iterative design process, ongoing barriers, and clinical implications for an educational web-based resource for families of young children with T1D: the Diabetes Information for Parents of Preschoolers (DIPPer) Academy website.

Methods

Stage 1 Parent Survey

Stage one of this user-centered design began with concept generation through a user needs assessment. In Stage one, parents of young children with T1D were offered an anonymous survey included with their regular clinic measures. All parents of a 3–5 year-old child who attended a regular diabetes clinic visit at a large Midwestern children’s hospital from February-July 2016 were eligible to participate. After verbally consenting to participate, parents used an in-clinic tablet with REDCap survey software to identify the ten most important aspects of T1D care out of a list of 25 possible items (e.g., “My child having a good HbA1c level.” “My child not feeling different because of diabetes.”). Parents then ranked these ten items in order from most to least important. The survey was developed based on previous literature and expert opinion/clinical experience (see Table 1). Twenty-

two parents verbally consented and completed this anonymous survey, representing a survey response rate of ~10% of eligible families. Once the initial investigation of user educational needs was complete, the researchers compiled previous literature, in collaboration with a pediatric endocrinologist and certified diabetes educator, into educational content for the highest ranked topics identified in Stage one. This represents the second design stage, system development, in which the research team developed initial prototypes of educational content in the form of video scripts and PowerPoint video mock-ups with narration.

Stage 2 Provider Feedback

In Stage two, the research team emailed a study description to all endocrinology providers at the same Midwestern children's hospital, offering the opportunity to participate in content development from September-October 2016. With an effort to include a mix of American Diabetes Association recommended providers (e.g., endocrinologists, registered dietitians, diabetes educators), the first providers to respond and schedule a visit were included in this convenience sample. Nine providers, including five pediatric endocrinologists, two certified diabetes educators, one nurse practitioner and certified diabetes educator, and one dietitian verbally consented, reviewed initial prototypes of educational materials (e.g., up to five scripts and video mock-ups), and provided feedback on ways to improve video content and viewer satisfaction in a one-on-one interview. These interviews were audio recorded and transcribed to ensure all feedback was captured. Providers also completed a brief paper-pencil survey about each video to quantitatively describe how important, useful, and enjoyable each video was and whether they would recommend videos on a nine-point Likert scale (e.g., "Not at all useful" to "Extremely useful"). At least two separate providers reviewed each video. The primary author compiled all provider feedback into a list of comments for each video and the research team incorporated provider feedback into a functional prototype to be used in the third design stage: objective usability testing. The research team created polished video prototypes through various production methods (e.g., PowerPoint slides with narration, whiteboard animation software, customized cartoons, and live-action film using a professional video production team).

Stage 3 Parent Feedback

In Stage three, the polished video prototypes were evaluated and further refined by parents of young children with T1D through usability testing. Parents were approached by the research team during their child's clinic visit at the same Midwestern children's hospital between January 2017-January 2018 to provide feedback to improve video accuracy, helpfulness, and user satisfaction. Parents were eligible to participate if they had a child with T1D between 3–5 years old, on an insulin regimen of multiple dose injections or continuous subcutaneous insulin infusion, an HbA1c within one standard deviation of clinic mean [7.3–9.6%], and were English-speaking. Thirteen mothers and one father provided written consent and participated in Stage three, representing an enrollment rate of 34% of eligible families. The average parent age was 34.16 ($SD= 4.12$) years and their median household income was \$57,607 ($SD= 27,268$). The average age of their children was 4.67 years ($SD= 0.77$) and the average HbA1c value was 8.27% ($SD= 0.48$). Sixty-four percent of children used insulin pumps, and the average child age at T1D diagnosis was 3.31 ($SD= 1.20$) years.

The sample for Stage three was relatively homogeneous in that all children were Caucasian and 7.1% identified as Hispanic/Latino.

Parents watched up to four polished videos online and provided feedback via a study-specific questionnaire using REDCap (Harris et al., 2009). At least two parents reviewed each video. Some videos included printable handouts and activities developed to accompany the videos, which parents also reviewed. Parents described how important, useful, and enjoyable each video was using a visual analog scale (e.g., “Not at all useful” to “Extremely useful”). Parents also described how much they liked the graphics, animation, and narration/background music, whether they would watch the video again, and whether they would recommend the video to others. Finally, parents reported the device on which they viewed each video (e.g., personal smartphone, tablet) and could use a text box to qualitatively describe ways to improve each video. Parents in Stage three received \$10 for each video review and an extra \$5 if they reviewed all four videos, for up to \$45 in compensation.

This study was approved by the local institutional review board prior to participant enrollment. Feedback from each stage of the iterative design process is summarized below, including quantitative survey ratings and qualitative comments.

Results

Stage 1 Parent Survey

The most important items identified by parents included: having a good HbA1c (91% of parents rated as important), avoiding long-term health complications (86%), preventing nighttime lows (86%), preventing hypoglycemia (73%), and helping their child gain confidence in managing diabetes (68%). All parent survey responses are listed in Table 1. Based on these results, the research team organized the top items into seven key content areas (e.g., insulin and safety, highs and lows, common concerns, talking to your child, coping, living to the fullest, and planning for the future), each containing 2–5 videos addressing important T1D self-care topics, for a total of 22 videos.

Stage 2 Provider Feedback

Quantitatively, 92.9% of providers endorsed that the preliminary video mock-ups were important to extremely important (rated 6–9 on nine-point Likert scale), 95.2% stated the videos were useful, and 92.9% would recommend the videos to their patients. In terms of enjoyment, 88.9% of providers enjoyed the videos overall, 85.7% enjoyed the graphics, 83.3% enjoyed the animations, and 78.6% enjoyed the narration and music. Providers gave the highest ratings for videos about managing blood sugar during exercise, managing fear related to diabetes (e.g. exposure), how insulin works in the body, long-term complications, what to expect at annual T1D visits, and positive attention. Videos with lower overall ratings included the videos about insulin management, sick day care, keeping up with new diabetes technologies, and how to help your child talk about diabetes.

Qualitatively, providers requested improved sound quality, the addition of background music, smoother slide transitions, and more professional animations. Providers had specific comments on terminology changes to improve content accuracy and remove jargon (e.g.,

association, fear hierarchy), remove aversive images of blood and syringes, shorten video length, and alter wording to stress positivity and family empowerment. For several videos, providers suggested using custom animations or real families to demonstrate key concepts (see Table 3 for examples of how feedback was incorporated into videos).

The research team revised each video draft to incorporate provider feedback, including dropping one video and creating two new videos for a total of 23 polished videos. The research team developed seven videos using Microsoft PowerPoint with narration added using video editing software (Camtasia, Techsmith Corp., Okemos, Michigan, USA) and six videos using whiteboard animation software (Videoscribe, Sparkol Limited, Bristol, OBY, UK). A hired cartoonist created one video ("Insulin is Key") for customized illustrations showing how insulin works in the body (CartoonWorks). Each of these videos included voice-over narration recorded using professional recording equipment. The study team filmed two videos with a pediatric endocrinologist using amateur video equipment. Lastly, the study team hired a professional video production company to produce seven videos (Scenic Road, Roeland Park, Kansas, USA). Costs associated with each of these production methods are listed in Table 2 and images of each video production method are listed in Figure 1. Once production was complete, polished video prototypes were sent to parents of a young child with T1D for further feedback.

Stage 3 Parent Feedback

Overall, parents reported enjoying the videos and rated their content as helpful. Parents rated the overall video importance at 80.8 (average rating of 80.8 out of 100 on visual analog scale), usefulness of videos at 74.9, and enjoyment of video at 73.4. Further, parents reported overall satisfaction with the graphics at 77.6, animations at 75.8, and narration and music at 77.3. Parents also indicated they would watch the video again at 74.2 and would recommend the video at 76.7. Parents were most likely to watch videos on a smartphone (57.4% of video views), followed by a computer/laptop (25.5%) or a tablet/iPad (17.1%).

Qualitatively, parents expressed how important these video topics were for parents of young children with T1D and expressed that the content of each video addressed areas of real concern (see Table 3). The most frequent critique parents provided pertained to sound quality in some of the animated videos, which was not judged to be the same quality as the live-action videos. Parents reported enjoying the videos produced by the video production company; especially the graphics, narration, and music included in these videos. However, parents did not rate these videos as more important or as providing more useful information. Many parents also reported liking the animations created by the research team. While parents indicated that they would be more likely to watch the live-action videos again, they rated several of the research team created videos higher with respect to importance and usefulness of content, and indicated that they would be more likely to recommend these videos to other parents (see Table 2). Following incorporation of parent feedback, the study team uploaded final videos to the DIPPer Academy website.

Discussion

Using an iterative, user-centered design process, we developed the DIPPer Academy website for parents of young children with T1D. The purpose of this website is to provide easily accessible resources tailored to the unique challenges faced by many families of young children with T1D. Based on initial parent input, the most important issues included achieving a good HbA1c, avoiding long-term health complications, fear of nighttime lows, preventing hypo- and hyperglycemia, and improving confidence in T1D management. These survey results mirror previous research (e.g., Harrington et al., 2017). Content areas also covered age-specific issues, such as oppositional behavior, unpredictable eating and activity patterns, and limited communication abilities typical for young children. After content area identification and prototype development, providers and parents described the video prototypes as enjoyable, providing important information, and said that they would likely recommend the videos to other parents of young children with T1D. These findings indicate that, through this iterative design process, we successfully incorporated multiple perspectives and developed user-centered educational resources that are satisfactory for providers, researchers, and parents.

In the final evaluation stage of this project, a randomized controlled trial (RCT) will examine how access to these videos impacts parent and child outcomes (e.g., adherence, coping, glycemic control) against a control group through additional usability testing. We hope that these high enjoyment and acceptability ratings will facilitate parent engagement and prevent attrition. In parallel to the iterative design of educational content, the research team collaborated with a technology developer (OnTarget, Kansas City, Missouri, USA) to create the DIPPer Academy website, which includes final videos under seven content areas organized as stars in the DIPPer constellation, an online community platform where families can share their experiences with T1D management, and a reporting site where parents can upload blood glucose data and receive feedback from healthcare professionals. Parents will be asked to provide additional feedback regarding the intervention and researchers will track website usage to continue to iteratively improve sustainability. Following successful pilot-testing, we hope to disseminate the DIPPer program through diabetes clinics, such as playing videos in clinic waiting rooms and providing families with website access shortly after diagnosis as an accessible supplement to ongoing care. Thus, the DIPPer program will become available to provide information beneficial to many families of young children with T1D, while those with the greatest need will still be able to access more intensive intervention in addition to this eHealth resource.

The research team used a variety of video production methods to develop the video content based on provider and parent input and budget considerations. The team elected to use videos as the primary mode of information delivery because they offer a way to deliver information quickly across a variety of devices, may require a lower literacy level than written materials, and may be perceived as more engaging. Previous oncology research indicated that the inclusion of video education can lead to greater information retention regarding disease management and treatment related symptoms than printed text (Campbell, Goldman, Boccia, & Skinner, 2004). Surprisingly, parents did not necessarily prefer videos with higher production value (e.g., live-action, custom cartoons) over videos created with

basic software (e.g., PowerPoint) or animation software (e.g., VideoScribe). This is a promising finding and indicates that researchers can develop acceptable materials with basic and commercially-available computer software. Thus, future researchers may consider creating videos with a variety of production methods to partially alleviate cost. Additional ways to cut costs may include partnering with video production companies that are willing to tailor costs to a research budget and collaborating with local media departments to use high-quality sound equipment for no cost (see Table 2 for example costs). It will be important for future researchers to consider the balance of cost, time, and user satisfaction during development of eHealth resources.

Finally, one aspect of intervention development that was highly requested by providers and parents was the inclusion of real families and providers in live-action videos. Inclusion of patients is controversial, as American Psychological Association (APA) guidelines warn against the risk of coercion for current patients asked to provide testimonials about their experiences (APA, 2017). However, families with T1D report significant benefit from interacting with other parents with shared experiences, as demonstrated by parent preferences for peer supports and positive effects of parent coaching interventions (Boogerd et al., 2015; Tully, Shneider, Monaghan, Hilliard, & Streisand, 2017). These perspectives were repeated throughout this study when providers and parents stated that certain topics would be more salient if described by a real family with T1D. Providers and parents generally requested that emotion-focused topics be presented by a real family with T1D, such as how to help their child to not feel limited by diabetes and coping strategies, and that informational topics be presented by an expert provider, such as keeping up with new diabetes technologies. Although we approached families thoughtfully, clearly explained the voluntary nature of the project, and fully described future video uses, it will be important for researchers to continue to balance user preferences and protections in the development of future materials that use real families.

Study Limitations

Some limitations of this study include its small, convenience samples at each feedback stage which are typical of iterative development designs, a research design that limited demographic information about the study sample (e.g. Stage 1 was an anonymous survey), and limited sample diversity where demographic information was available (e.g. majority non-Hispanic white, English speaking). Although T1D is most prevalent in non-Hispanic white youth (over 80%), it will be important to consider racial health disparities and further cultural adaptation prior to dissemination (Willi et al., 2015). Although the majority of families have internet access, families in rural and low-income settings who may be most in need of resources may need assistance in accessing these resources. We also did not collect detailed information to conduct a full cost-analysis (e.g., time spent on each video), which should be investigated by future researchers, and there was a lack of validity data on provider/parent acceptability ratings. Finally, long lag times between video development and dissemination may impact acceptability and use, and is an ongoing concern in the empirical development of eHealth resources.

Conclusion

The research team feasibly used an iterative, user-centered design process to develop 23 educational videos and accompanying handouts/activities for the DIPPer Academy website. Multiple perspectives from parents, providers, and researchers were successfully integrated into resources with high ratings of content importance, user enjoyment, and video satisfaction. Parents and providers overwhelmingly reported that they would recommend these resources to other families of children with T1D. Next steps will be to test how access to the DIPPer Academy website, including these educational resources, a community blog, and blood glucose reporting impacts parent and child outcomes in an RCT.

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Figure 1.
Video screenshots produced using (A) PowerPoint, (B) Whiteboard Animation, (C) Cartoonist, and (D) Video production company (live-action).

Table 1.

Aspects of T1D care rated as most important on Stage 1 parent survey (N=22).

Survey Item	Rated as Important (%)
My child having a good HbA1c level.	90.9%
My child avoiding long-term complications related to diabetes.	86.4%
My child having a low blood sugar in the middle of the night or when I'm not around.	86.4%
My child not having a low blood sugar level.	72.7%
Teaching my child how to help take care of his/her diabetes.	68.2%
My child not feeling different because of diabetes.	59.1%
My child not having a high blood sugar level.	59.1%
My child staying safe with his/her blood sugar when playing sports/games.	59.1%
Knowing how to manage my child's blood sugar when he/she is sick with a virus/infection.	54.5%
My child growing up and not being limited by his/her diabetes (e.g., able to go to school, college, hold a job, have a family).	54.5%
Balancing diabetes care with normal family activities.	50.0%
Dosing my child accurately for insulin.	50.0%
Feeling like I can confidently manage my child's diabetes.	45.5%
Knowing how to talk to other adults about diabetes management.	36.4%
My child not telling me when he/she is feeling high or low.	36.4%
Keeping up to speed with new diabetes technologies.	31.8%
Teaching my child ways to manage fear or discomfort related to diabetes.	31.8%
Balancing how much attention I give to my child with diabetes versus to his/her siblings.	31.8%
What to do if my child doesn't eat after I have already given him/her insulin for a meal.	31.8%
My child eating food and not telling me (no insulin dosed).	31.8%
Feeling like I can confidently manage my child's behavior when he/she is misbehaving.	27.3%
My child eating a variety of foods including fruits and vegetables.	27.3%
My child feeling comfortable telling me about high or low blood sugars.	22.7%
Helping my child adjust to new treatments (e.g., adding an insulin pump or CGM)	13.6%
How to help my child if he/she hates needles.	4.5%

Table 2.

Parent visual analog scale ratings of video content and quality, plus cost and time by production method.

Survey Item	Video Production Method			
	PowerPoint	VideoScribe	Cartoonist	Live-Action
Number of Videos	7	6	1	7
Important	89.12	75.50	75.00	77.98
Useful	83.57	75.58	76.50	65.48
Enjoyable	71.88	67.14	74.50	80.12
Liked Graphics	74.02	77.64	70.50	82.62
Liked Animations	74.09	77.50	57.50	78.76
Liked Narration & Music	74.07	74.17	79.00	83.12
Would Watch Again	74.74	66.89	72.00	80.21
Would Recommend	81.74	75.33	83.50	71.98
Cost	\$250/year	\$119–\$144/year	\$1,000	\$14,000–\$22,710
Time (qualitative)	Moderate	Most	Least	Moderate

Table 3.

Examples of provider and parent qualitative feedback incorporated into videos.

Video	Provider & Parent Feedback	Video Alterations
Sick Day Cure	<i>This one I feel like doesn't necessarily empower the patient. Having been a fellow and having to take calls from parents, I feel like this has a low threshold for them to call and doesn't necessarily empower them to know what to do about it...when they emphasize, call your doctor if that really creates the panic instead of empowering them to, hey, you can do this. Your kid has been sick before. Just because they have diabetes doesn't mean it's a crisis. It just means you need to check more frequently...[and] I don't see a big emphasis on hydration, which is one of the big things that we recommend to kids. So I would emphasize hydration more. (Pediatric Endocrinologist)</i>	<ul style="list-style-type: none"> • Changed content of video from creating a sick day plan with your diabetes team to "check often, hydrate, and don't panic" • Added tips to stay hydrated when kids are vomiting • Re-phrased diabetes team as one resource to help when your child is sick to encourage autonomy
Insulin is Key	<i>If you could have more, I like the pictures of the kid actually doing it. And then the graphics, if it was more, like the lock and key is better with, I think, with movement. So if you can actually see those graphics do something rather than just, here's a key, here's the cell. Actually show the glucose moving in with the insulin. (Pediatric Endocrinologist)</i>	<ul style="list-style-type: none"> • Hired cartoonist to create custom animation of insulin unlocking cell and glucose moving into cell • Cartoon includes boy learning about insulin with his mom
CBT Coping	<i>Nothing can compare to actually having someone walk you through the situation. So it's good from the fact of them understanding it's okay to be stressed out or burned out, but maybe having something in there about, if you're feeling these and having trouble coping, talk to your child's psychologist or social worker or something on their care team. Or even having a personal testimony in there about parents that felt burned out and what they did to overcome it. (Dietitian)</i>	<ul style="list-style-type: none"> • Hired professional video production company to interview a family with T1D on how they use coping strategies and avoid burn-out
Child Development (3–4 years)	<i>I appreciated the content in this video. I am always looking for ways to help my 4 year old participate in the diabetic care. He can tell us when he is low or high and has started checking his blood sugar at times. I would be interested to see the next video for the coming age range. I think this content is very important to share with parents who are dealing with T1D. (Parent)</i>	<ul style="list-style-type: none"> • No changes