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Taking Evidence-Based Coping Skills Training to the Internet

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Introduction

Coping skills training (CST) addresses adolescents' coping skills and behavior patterns related to type 1 diabetes management and has demonstrated improved health and quality of life outcomes [1, 2]. CST is delivered in small groups and attempts to promote adaptive coping skills that translate to improved abilities to solve problems around diabetes management. CST trials have evidenced a large effect size, making this approach one of the best supported among adherence-promoting interventions for this population [3]. Internet-based health promotion interventions are growing in popularity, with benefits including wide accessibility, appeal to teenagers, potential for individualized content and contact between users, and demonstrated impact on health and mental health outcomes [4]. Considering the established efficacy of CST and the potential advantages of intervention delivery via the Internet, a team of investigators set about adapting CST for Internet delivery.

Aims

CST, delivered in-person with adolescents with type 1 diabetes, was created by Grey et al. [1, 2], and has demonstrated a long-term impact on glycemic control and quality of life. The

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Disclosure

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aims of the Internet-based CST project reviewed in this article were to 1) adapt CST for the Internet, 2) determine its feasibility and acceptability with adolescents with type 1 diabetes, and 3) evaluate its preliminary efficacy compared with Internet-based diabetes education.

Methods

The team of investigators conducted an iterative process to develop Internet-based CST at two clinical sites in the northeastern United States. They used a multi-method approach to adapt the CST program to the Internet, obtain critical feedback, and analyze preliminary between- and within-group differences. Prior to implementing each step of the study, approval by the Institutional Review Board was obtained.

The first step was to adapt in-person CST for Internet delivery, with the collaboration of health professionals and web developers. Previous CST study participants were also consulted through focus groups. The CST website was developed to include five weekly online sessions based on social learning theory, covering the topics of self-talk and skills for communication, social problem solving, stress management, and conflict resolution. This content mirrored the content of the offline CST protocol. Each online session used a graphic novel format and interactive characters to present diabetes-related scenarios and possible solutions using the behavioral skills taught in each session. This presentation was designed to appeal to adolescents and engage them in the various scenarios. The CST website also included a discussion board that had its content monitored by a clinical psychologist.

The research team also developed a diabetes education website that was similar in format and style to the CST online program. The diabetes education website included four weekly online sessions about blood glucose control, nutrition, physical activity, sick day management, and technologies for diabetes care. Following initial development, three adolescents who had participated in previous CST studies and their parents provided feedback about program content and format using the “think-aloud” technique. This technique allows participants to critique the program by describing their reactions as they used the website, including aspects they liked and disliked. Comments were recorded, coded, and analyzed by research staff. Various iterations of the CST Internet-based program were made and reviewed based on participant feedback.

The next step of adapting CST to the Internet was to assess feasibility and collect pilot data comparing the two websites. Twelve patients with type 1 diabetes between the ages of 13 and 16 years were enrolled and randomized to CST or the education control condition. Participants in each condition completed online sessions and received email reminders when new sessions were made available or if sessions had not been completed. Psychosocial and diabetes management outcomes were assessed prior to and following completion of the intervention sessions, covering the following domains: general and diabetes-related quality of life, symptoms of stress and depression, and diabetes-related coping and self-efficacy. These outcomes were measured with a series of validated questionnaires. Medical data, including glycemic control, were extracted from the medical chart. Satisfaction with the intervention was also assessed at follow-up with a five-item survey.

The third step of CST Internet development was to obtain a final round of feedback on the website content and format from 10 adolescents from diverse ethnic and cultural backgrounds, due to the limited ethnic diversity of the previous adolescent reviewers. This group of 10 adolescents included five teens identifying themselves as Hispanic and five teens who identified themselves as black. Semi-structured interviews were conducted regarding acceptance of the intervention and suggestions for modifications, and a final round of revisions to the websites was made.

Results

Qualitative data from the focus groups and think-aloud sessions were analyzed using content analysis and data display matrices to identify common themes. Adolescents expressed satisfaction with the interactive nature of the content and the diabetes-specific problem-solving scenarios. Suggestions from teens and parents included clarifying instructions, ensuring online security, and modifications to the dialogue between characters delivering the content.

The second analysis assessed the feasibility of administering the Internet-based CST program and examined group differences on the psychosocial and diabetes-related dependent variables. For piloting purposes, time and group effects were examined using a liberal *P* value of 0.20. Participation was higher and more consistent for the CST group than the education group; CST participants logged into the website twice as frequently as the education group. After the intervention, both groups reported better diabetes self-efficacy. The CST group also had better diabetes coping, treatment-related quality of life, and less stress, whereas the education group had better communication. Although both groups reported high satisfaction with the interventions, the CST group reported they enjoyed the intervention more.

Finally, the investigators examined qualitative data from black and Hispanic adolescents who used the revised websites after the pilot study phase. Overall, feedback regarding clarity, interest, and appropriateness for teenagers was largely positive for both websites. Themes that emerged for the CST website included relating to the characters and other teenagers, and appreciating the opportunity to address feelings about diabetes; this feedback was similar to the feedback obtained by teen reviewers at the primary study site, who were primarily white.

Discussion

The investigators concluded that the Internet-based CST program was feasible and acceptable to adolescents with type 1 diabetes. There was no attrition from the pilot study, and most participants completed all online intervention sessions. The investigators noted that pilot data demonstrated the potential for improvements in psychosocial outcomes following Internet-based CST. Although it required substantial time and resources, the multistep process to adapt and test the program was found to be informative and beneficial to improving the website. Multidisciplinary collaborations and feedback from adolescents with diabetes and their parents were particularly valuable.

Comments

This team of investigators conducted an intensive, multistep process to successfully adapt an evidence-based intervention for adolescents with type 1 diabetes for Internet delivery. Results, strengthened by the randomized, controlled nature of the pilot study, provide initial indications of feasibility, acceptability, and positive impact of web-based CST. Further, the clinical researchers used a rigorous, patient-centered approach to intervention development that was attentive to cultural, developmental, and learning theory factors.

The next steps appear to be an examination of the impact of web-based CST on treatment adherence and glycemic control. Given the improvements in these outcomes following in-person CST [1, 2], and the impact of Internet-based interventions on other health behaviors and outcomes [4], CST delivered via the Internet is likely to have similarly robust results. It will be important to test the impact of this intervention with a wide range of adolescents, which the authors note is currently underway. Examining outcomes in teens with poorly controlled diabetes would have particular clinical relevance. Adaptations for teens at risk for poor diabetes control, such as those with identified coping problems (e.g., elevated depressive symptoms), or targeting other people coping with the challenges of managing type 1 diabetes, such as parents [5], may also be worthy endeavors. Eventually, the authors will want to consider methods of dissemination for widespread clinical use. One consideration will be the feasibility and cost of engaging a clinical psychologist to monitor the Internet discussion board.

In sum, the development of the Internet CST program is an example to interventionists seeking to create or adapt web-based behavioral treatments that are relevant to, accepted by, and likely effective for adolescents with type 1 diabetes. The investment of time and resources to engage multidisciplinary collaborators and teens and families benefited the program's development. Pilot results were encouraging for both groups, and particularly for the coping skills group. Internet interventions like this one hold promise to reach patients in rural areas or those with limited access to health and mental health care providers, and ultimately aim to improve health and quality-of-life outcomes.

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