

Developing a Computerized Video Intervention to Improve Family Knowledge of Environmental Triggers for Children with Asthma

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Introduction

Asthma affects 1 in 11 children in the United States. Although asthma cannot be cured, patients can help control their asthma with appropriate medications and by avoiding exposure to environmental triggers, such as dust, mold, and pet dander. There is increasing utilization of home-visiting programs to educate families about triggers in their home. Although these programs have proven effective, they are resource and time intensive, and require trained educators. The aim of the authors of this study was to develop a point-of-care version of the home-based education using *Computer Intervention Authoring Software (CIAS)* (Phase 1), and to test the efficacy of this intervention using a Randomized Control Trial (RCT) (Phase 2).

Methods

In phase 1 of the project, a Certified Asthma Educator (JT) created eight videos addressing how to identify asthma triggers in the home and ways to remediate these triggers. The videos were uploaded into a *CIAS* framework that allows patients to choose which videos they would like to include in their personalized educational module and watch them on a tablet device in the emergency room setting (Figure 1). Phase 1 was completed between June and August of 2017.

Phase 2 is a RCT of the educational intervention in the emergency department using computer tablets. This phase began in September of 2017 and is currently ongoing. Parents of children ages 1-17 years presenting with asthma or early-

childhood wheezing to the Hasbro Children's Hospital Emergency Department are eligible. Parents will complete a pre-survey to determine what asthma triggers are in their homes. Participants randomized to the intervention arm will participate in the customized home asthma trigger education, and participants in the control arm view videos about asthma medications. One week after enrollment, all participants complete a survey assessing their knowledge of asthma triggers and changes made in the home to remediate triggers. Knowledge scores and frequency counts of changes made in the home environment will be compared between the study arms. Acceptability of the intervention will be assessed among the intervention group participants.

Results

Phase 1 of the study was completed in August of 2017 and a customized educational intervention with eight videos on individual topics was produced. The videos reflect important triggers for asthma, as defined by the current literature, and highlight specific cost-effective and simple interventions that participants can make in their homes. To date, twenty-four (24) participants have been enrolled in the phase 2 RCT; twelve (12) participants were randomized to the intervention group. Comparison between groups will be performed at the end of the study (N=90). The results of an interim analysis of acceptability data, scored on a 5-point Likert Scale, indicate that participants found the intervention helpful (mean 4.08 ± 0.90); relevant to their child's well-being (4.17 ± 0.84); and an adequate teaching tool (3.92 ± 0.90). Participants rated the overall quality of the program "above average" (4.08 ± 0.90); and would recommend the program to a family member or friend (4.3 ± 0.82). Additionally, participants indicated that it is important to improve their home environment for their children (8.91 ± 1.20 on a scale from 0 to 10); and were confident they could follow the recommendations outlined in the intervention (8.38 ± 1.36).

Conclusion

CIAS can be used to provide customized home asthma trigger education at the point-of-care. The preliminary results of this study indicate that this educational video-computer model is acceptable to participants, and that parents found it to be a helpful and relevant teaching tool. Additionally, participants were confident in their ability to follow the recommendations outlined in the intervention. Upon completion of enrollment, aggregate data will be analyzed to determine the efficacy of these education materials based on comparisons between the control and intervention groups. Given the electronic platform and accessibility of the modules, there is potential to expand use to other healthcare settings. This study excluded non-English speaking participants, although language adaptation is planned for future iterations of the modules.