Intelligent Tutoring System

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Project Overview

A major barrier to training front line clinicians in evidence-based treatments is the lack of time-efficient and educationally effective training models. Innovations in computer science and adaptive training algorithms may provide a way to train clinicians in effective use of EBPIs. Early evidence on these programs finds that they effectively reduce time in training, improve competence in complex decision-making and standardize training. Our study builds on the existing research base on EBPI training, and adds to it by designing and testing a computerized training program (ITS) based on adaptive training algorithms. We hypothesized that capacity building through improved EBPI learnability (target mechanism) will result in enhanced clinical ability to deliver EBPI elements competently, in a shorter time period, and that greater competence will result in better quality of care.

Aim 1. Discover Phase (3 months): Identify common challenges in training paraprofessionals in evidence-based practices.

Aim 2. Design and Build Phase (9 months): Build and iteratively design an Intelligent Tutor in evidence-based practice core elements to be used in a classroom setting. Iteration will be done in three cycles.

Aim 3: Test Phase (18 months): Compare the relative impact of the ITS in clinical training of paraprofessionals to clinical training alone on paraprofessional ratings of intervention delivery and intervention acceptability, usability and feasibility.

Population/Sample

Aim 1 Sample: We interviewed 10 experts in paraprofessional training to identify the key challenges and pain points they see in paraprofessional implementation of best practices.

Aim 2 Samples: We tested an initial ITS prototype in a summer class of behavioral activation with 11 students. The second iteration was tested in 6 students participating in training in tCBT.

Aim 3 Sample: 30 students from three different bachelors programs in the US participated in a randomized study to compare the ITS to homework as usual.

Key Findings

Aim 1 findings: Areas that trainers found to be difficult pain points for paraprofessionals were in the following skills: Empathy and Reflection, Goal Setting, Homework Review, Cultural Humility.

Aim 2 findings: The majority of students (81.8%) in Wave 1 and all of the students who submitted role-plays in Wave 2 passed the clinical skills role-play. Students advancing through the ITS more quickly had better competency ratings than those progressing more slowly.

Aim 3 findings: All students, regardless of their group assignment improved in their clinical competencies. We found that students in the ITS condition felt that behavioral activation was more acceptable, feasible, and implementable compared to their initial perceptions of the interventions.

Measures used

- AIM, FIM, IAM
- EBPAS

Methods

Aim 1: Using iterative methods, we worked with 10 experts in training paraprofessionals to discover challenges they face in delivery of best practices, identify areas in the traditional curriculum that supported their skill acquisition, and areas that were missing from the training. Feedback from study team members with expertise in teaching bachelor-level students and other key stakeholders was used to build the adaptive algorithm in Aim 2.

Aim 2: After identifying educational modification targets, and key decisional dilemmas to be built into the program, we built an Intelligent Tutoring System (ITS). We then piloted this beta version of the ITS with 6 bachelor level trainees at Hertitage University in a class focused on training them to deliver telephone-based CBT in Yakima Valley Farmworkers Clinic.

Aim 3: 30 student participants were randomized to receive either ITS homework or homework as usual in a 16-week social work course. Student participants completed the AIM, FIM, and IAM before and after classes ended. They also participated in a role play of goal settings and activity scheduling before classes began and after classes ended

Next steps

The ITS is currently being further adapted for a large-scale, statewide program for a credential in Behavioral Health Specialists to be trained to work with depression and anxiety in primary care medicine. The ITS has been further expanded to include modules on suicide prevention, anxiety management and substance use disorder.

Recommended readings

Renn BN, Areán PA, Raue PJ, Aisenberg E, Friedman EC, Popović Z. Modernizing Training in Psychotherapy Competencies With Adaptive Learning Systems: Proof of Concept. Research on Social Work Practice. 2021;31(1):90-100.