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Title: Treatment Engagement With Technology-assisted Treatment

1. Abstract

Technology-assisted treatment, or TAT (e.g., online modules, mobile applications), shows promise for innovative assessment, prevention, and treatment of substance use disorders (SUDs). The widespread access to TAT makes it a potentially cost-effective and innovative option available for delivery in multiple settings. To date, there have been no published studies that investigate whether TAT is effective in patients with SUDs in addition to another psychiatric illness (dual diagnosis patients). Thus, we plan to pilot a computerized cognitive behavioral therapy (CBT) program called the Therapeutic Education System (TES) in dually diagnosed inpatients and allow them access to the program as outpatients as well. Our hypothesis is that those assigned to TES will have better program retention and outpatient attendance than those assigned to treatment as usual (TAU), because the patients using TES may be more engaged in the process of problem recognition and problem solving with regard to their mental health and substance use problems. This research will be valuable to better understand the treatment needs of this dually diagnosed population, including ways to keep them engaged in care.

2. Objectives

We propose to conduct a controlled study assessing: 1) whether exposure to TES during hospitalization is acceptable to dually-diagnosed patients, and 2) whether TES use affects post-discharge treatment retention.

3. Background

Several computerized contingency management and cognitive-behavioral interventions for SUDs have shown efficacy in single-site clinical trials, and TES has been shown to have efficacy in a clinical trial involving multiple community-based addiction treatment programs[1-4]. We surveyed inpatients on two hospital-based dual diagnosis units at the Johns Hopkins Hospital (JHH) to assess their interest in, access to, and experience with TAT, as well as preferences for content and implementation. Preliminary data suggest that despite most patients having no previous TAT exposure, they would welcome TAT during and after hospitalization, and would consider it helpful. Some patients preferred face-to-face therapy alone, suggesting that TAT should not completely replace these services.

4. Study Procedures

a. Study design, including the sequence and timing of study procedures

This project will be conducted on the Motivated Behaviors Unit (MBU), which is an inpatient dual diagnosis treatment service located on Meyer 3. Standard MBU treatment comprises a psychiatrist-led interdisciplinary team as well as face-to-face group counseling for substance use and skills for improving general mental health. There will be no change to the routine care (treatment at usual [TAU]) provided to patients on the service.

Informed consent will be obtained from each potential participant. This process will include permission to contact participants following discharge, and to review their hospital chart for necessary information such as demographics and diagnoses. Volunteers will then undergo a baseline assessment on acceptability of TAT, using an instrument developed for this project, as well as an assessment of self-efficacy and health-related quality of life using the NIH Toolbox Self-Efficacy Survey[5], and the Medical Outcomes Study 36-item Short-Form Health Survey (SF-36),[6] respectively. Study participants will be randomized using an urn design method to receive either TAU or TAU plus TES. Patients will be stratified based on ethnicity, gender and whether

the primary drug of use is an opioid. Patients in the TES group will be taught how to use the web-based therapy while inpatient and provided access to the system while residing on Meyer 3 using a participant-specific username and password. Each person's account will be logged out at the end of their session on Meyer 3, and the laptops will not be used by other (non-study) patients, ensuring confidentiality. Participants will be encouraged to continue using the TES program after discharge by accessing the website with their login information. A reminder will be sent to them regularly via email or text message regarding their access to the program. They will be advised to log out after every session and close their browser, but to be aware that if someone were to track the history of the Internet browser, the HealthSim website would appear. Patients will be given a list of places available to use a computer for free, such as patient resource centers at JHH and the University of Maryland Hospital, as well as public libraries. The study team will have separate, password-protected access to user data within the TES program, though any patient identifiers will be kept separate from the program. HealthSim keeps user data confidential, and uses data at the minimum required for maintenance and support of the program's use by each site. Per HealthSim, "any such use, however, shall be conducted in accordance with all applicable law and regulations, including privacy regulations."

The TES program consists of a series of 65 interactive modules on substance use-related topics (e.g., effective problem solving; HIV and AIDS; drug refusal skills training). We expect it will take less than thirty minutes to complete each module. Patients will be able to access the program during 1-hour long sessions, as often as possible. We anticipate TES usage will amount to at least 2 hours per week. The assessment of TAT acceptability, self-efficacy and health-related quality of life will be re-administered prior to inpatient discharge, and then during follow up (as described below).

Many patients discharged from the MBU receive referral appointments to the Community Psychiatry Programs (CPPs) at JHH or Johns Hopkins Bayview Medical Center (JHBMC) for psychiatric care, and many also go to the Broadway Center (the primary outpatient site operated by JHH for substance use treatment). When possible and appropriate, these will be the preferred referral sites for study participants, as is current practice. Patient involvement with outpatient care (i.e. enrollment) at either CPP can be tracked via the Electronic Medical Record. We will also track patient retention at other mental health and substance use treatment programs that patients may be referred to, by contacting the program directly with the patient's consent.

b. Study duration and number of study visits required of research participants.

At the time of study enrollment and prior to discharge from the hospital, patients in both groups will be administered a survey that assesses acceptability of their inpatient and outpatient treatment, self-efficacy and health-related quality of life, drug and/or alcohol relapse, and the experimental group will also be assessed for their acceptability of TES.

Since the length of inpatient stay and other factors may vary across patients, we will not attempt to dictate the number of TES modules that should be completed but will attempt to ensure that all TES participants have experience with the program before they leave and will track and record the amount of usage during the inpatient stay.

c. Blinding, including justification for blinding or not blinding the trial, if applicable.

Blinding is not possible as those getting the intervention will be using the computer program whereas those that are in the control group will not.

d. Justification of why participants will not receive routine care or will have current therapy stopped.

All patients will receive treatment as usual, so no routine care will be stopped.

e. Justification for inclusion of a placebo or non-treatment group.

The TAU group will not receive the TES intervention, though they will still receive the typical treatment on the unit. A comparison of the survey responses and post-discharge program adherence of the TES and TAU groups will provide information as to whether the TES intervention is helpful.

f. Definition of treatment failure or participant removal criteria.

Participants will not be removed for treatment failure, as part of our goal is to investigate whether the TES program is easy to use by, and interesting to patients as part of the acceptability survey and review of module completion. Participants will be removed from the study if they no longer meet the inclusion criteria. For example, if a patient's status changes to involuntary they will be removed from further participation, but any data gathered up until that point will be used in analysis.

g. Description of what happens to participants receiving therapy when study ends or if a participant's participation in the study ends prematurely.

Participants in the TES group will no longer have access to the computer-based program after the study ends, or if their participation ends prematurely, but all patients will receive standard inpatient care and referral to post-discharge treatment.

5. Inclusion/Exclusion Criteria

Potential participants will be patients voluntarily admitted to the JHH Motivated Behaviors Unit (MBU), whose patients primarily present from the East Baltimore community. Eligibility criteria include self-report of drug or alcohol use in the 30 days prior to admission, diagnosis of both a substance use disorder and other psychiatric illness, a proficiency in English, and an ability to provide informed consent. Patients who are actively psychotic, or cognitively impaired with a Mini-Mental State Examination (MMSE) score of 25 or less will be excluded. After listening to a recording of the content of the informed consent form, participants must be able to obtain a score of 100% on a consent quiz after up to 3 attempts, with a chance for remediation between attempts. We will consent 150 participants with a plan to accrue about 130 persons in order to allow for drop outs or other early removals from the study and have a total of at least 100 participants. Our screening process will involve a study team member using the electronic medical record to ensure that the patient does indeed meet criteria for inclusion. The potential participant must be willing to participate and agree to the procedures in the consent form, such as allowing the team to contact his/her post-discharge provider(s). The person should also be willing to complete the risk assessment module through the TES program and at least one other TES module if randomized to that treatment arm, and to seek post-discharge treatment. Patients must have an email address, and if they do not have one they will be assisted in setting up an email account for distribution of surveys post-discharge. If a person does not set up an email account, surveys can be administered by phone post-discharge. The preferred method of payment for participant incentives will be Bank of America prepaid debit cards, so that

funds can be electronically deposited after they are discharged from the hospital. Participants will be required to sign an agreement regarding use of these cards. If necessary in certain cases, participants may receive other physical or electronic gift cards.

6. Drugs/ Substances/ Devices

a. The rationale for choosing the drug and dose or for choosing the device to be used.

As noted above, TES has shown efficacy in clinical trials among patients with SUDs in community-based addiction treatment programs. The two-group randomized design with TAU as the comparison condition was selected to provide a clinically relevant evaluation of TES when used as a supplement to TAU. Since acceptability and effects on post-discharge follow up care are of primary interest in this pilot trial rather than mental health or drug use outcomes, any imbalance in amount of therapy delivered should not be relevant.

b. Justification and safety information if FDA approved drugs will be administered for non-FDA approved indications or if doses or routes of administration or participant populations are changed.

N/A

c. Justification and safety information if non-FDA approved drugs without an IND will be administered.

The Therapeutic Education System (TES) is not a physical/mechanical device; but it is a software program that is accessed through the Internet on any PC or Mac computer using a specific username and password. Our research subjects will use it through a site-specific license, so that their information is separate from other TES users. TES does not pose any significant risk to subjects as it is not an implant, is not used for sustaining human life, does not present potential for serious risk to the health, safety or welfare of a subject and will not be used substantially in diagnosing, curing, or mitigating disease. It is a treatment, but it is not the primary treatment modality that will be employed with patients who enroll in this pilot study. As therapy, it will only be used adjunctively to treatment as usual in the form of education, in a supervised manner. Thus, TES does not meet the definition for a significant risk device, but is a nonsignificant risk device.

7. Study Statistics

a. Primary outcome variable.
Acceptability of TES, via both self-report and actual usage, will constitute the primary outcome measure for the randomized design portion of the study.

b. Secondary outcome variables.
The enrollment rate for outpatient mental health and substance abuse treatment at 30 days post-discharge, and patient satisfaction regarding the hospital stay among both groups will be investigated as secondary outcomes.

c. Statistical plan including sample size justification and interim data analysis.
TES acceptability will be rated on a scale of 0-10, and will be analyzed by mean and SEM. Comparison of hospital ratings will be performed using a paired t-test. The hypothesis is that the TES group will have significantly higher ratings than the TAU group. Based on a previous study of acceptability of TES compared to standard treatment[7], a power analysis with alpha = 0.05

indicates that 50 persons per group is adequate to demonstrate an effect size of 0.313, where estimated power is 0.87.

d. Early stopping rules.
Those patients who leave against medical advice without a follow up appointment will be excluded from further participation in the study and thus can be included in analysis of any surveys completed during their stay, but not the post-discharge surveys. Any participants who no longer meet inclusion/exclusion criteria (e.g. MMSE score falls to 25 or below) will be removed from the study.

8. Risks

a. Medical risks, listing all procedures, their major and minor risks and expected frequency.
N/A

b. Steps taken to minimize the risks.
N/A

c. Plan for reporting unanticipated problems or study deviations.

These will be reported promptly to the IRB if any arise, though this is unexpected.

d. Legal risks such as the risks that would be associated with breach of confidentiality.

Given the content of the questionnaires there is little anticipated legal risk.

e. Financial risks to the participants.

N/A

9. Benefits

a. Description of the probable benefits for the participant and for society.

The participants in the TES group will benefit from participating in this study through increasing the skill set needed to work in recovery. Patients such as those participating in this study who have a substance use disorder as well as another psychiatric illness will benefit from the findings of this study as it will help us to better understand the needs of this population and whether this treatment will help them to be more engaged in their recovery. Similarly, this research will help the field and society through advancing what is currently known about psychiatric services for treating dually diagnosed patients, and thus working to reduce the mental and physical health complications, financial burden and disability caused by addiction in the community.

10. Payment and Remuneration

a. Detail compensation for participants including possible total compensation, proposed bonus, and any proposed reductions or penalties for not completing the protocol.

Each participant will be given a $10 Bank of America prepaid debit card or gift card for completing the initial survey at the time of study enrollment, and $10 for each completed study survey. Each participant will have the opportunity to earn up to $50 if all surveys are completed.

11. Costs

a. Detail costs of study procedure(s) or drug (s) or substance(s) to participants and identify who will pay for them.

There are no costs to patients who enroll in this study. Costs associated with the computer-based treatment provided, and the incentives for this study, are not the responsibility of the patient, but are funded through a K award (Dr. Eric C. Strain, PI), and a scholarship received by Dr. Alexis Hammond.

References

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