Protocol for a Randomized Controlled Trial in Cambodian Individuals with PTSD: Trauma-Informed Treatment Algorithms for Advancing Novel Outcomes (Project TITAN)

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Abstract

Introduction: Low- and middle-income countries shoulder a disproportionate burden of mental health disorders with limited resources to support the provision of care using culturally relevant, evidence-based interventions. This is particularly true in Cambodia where the population continues to confront traumatic consequences of the Khmer Rouge genocide that targeted educated people, including treatment providers. Trauma-Informed Treatment Algorithms for Advancing Novel Outcomes (Project TITAN) will examine proof of concept and preliminary efficacy of culturally tailored interventions for Post-Traumatic Stress Disorder (PTSD) among Cambodian adults. Methods: A stepped care randomized controlled trial enrolling people seeking mental health treatment as well as priority populations with high rates of trauma exposure, including female entertainment and sex workers and sexual and gender minorities. In total, 160 participants with PTSD are randomized to Stabilization Techniques or Behavioral Activation plus Stabilization Techniques, implemented within a culturally relevant framework. Individuals who do not achieve clinical remission of PTSD after six treatment sessions receive Eye Movement Desensitization and Reprocessing therapy. PTSD, depression, anxiety, and substance use are assessed at baseline and two and four months post-randomization. Planned Analyses: The percentage of individuals achieving remission of PTSD after four months is the primary outcome. Secondary outcomes are depression, anxiety, and substance use over four months. Finally, machine learning analyses will be conducted to identify features at baseline and during treatment that predict primary and secondary outcomes. Discussion: Findings will guide future development and implementation of interventions to improve mental health conditions, including PTSD, among individuals in Cambodia and other resource-limited settings.
Introduction

Globally, mental disorders are a leading cause of disability and premature death.\textsuperscript{1-3} Between 1990 and 2019, there was a 48% increase in the number of cases of mental disorders, with depression and/or anxiety representing the most common diagnoses across the gender spectrum.\textsuperscript{4} Translation, deployment, and scale-up of evidenced-based treatments has not matched pace with the growing burden of mental health conditions worldwide, representing a potential economic and public health crisis.\textsuperscript{5} Recent analyses by Arias et al.\textsuperscript{6} cast a dark shadow on the financial impact of mental health disability, with a forecasted burden that is expected to reach three trillion USD worldwide by 2030.

Further exacerbating the global prevalence of mental health conditions, the gap between need and availability of clinical care for mental health conditions is widening.\textsuperscript{7} The availability of culturally relevant, evidence-based interventions for mental disorders is particularly problematic in low- and middle-income countries (LMICs),\textsuperscript{7,8} which account for 80% of mental health disorders worldwide.\textsuperscript{9,10} Prior studies report that, on average, LMICs spend a modest 0.5% of their national health budgets on the provision of mental health care whereas high-income countries (HICs) spend 5.1\%.\textsuperscript{11,12} This treatment gap is perhaps no more evident anywhere in the world than in Cambodia, where nearly half of the population reports significantly elevated levels of anxiety, depression, or substance use.\textsuperscript{13,14} The high levels of psychological distress reflect the effects of historic and ongoing traumatic exposures, the most notable of which was the agrarian political regime of the Khmer Rouge in the 1970s.\textsuperscript{15,16} During this period, approximately 1.5 million Cambodian residents died of starvation or sickness, 500,000 individuals were executed, and another 2 million were displaced, including many who were forced into hard labor.\textsuperscript{15,16}

The Khmer regime targeted educated individuals, including academic researchers, physicians, and mental health professionals, which effectively dismantled an already vulnerable public health system and set the foundation for intergenerational consequences of trauma.\textsuperscript{15,16}
The synergy of these historic trauma exposures and ongoing stressors, including high rates of violence against women, human trafficking, and poverty,\textsuperscript{17-19} has created barriers to optimal mental health among the Cambodian population. As such, there is a pressing need to close the mental health gap in Cambodia using culturally relevant, evidence-based approaches that are scalable and sustainable.

In partnership with the Cambodian Ministry of Health, Department of Mental Health and Substance Abuse, Royal University of Phnom Penh, and community-based mental health clinics, and with funding support from NIMH (R01MH114722), investigators in the US and Cambodia are conducting a randomized controlled trial (RCT) entitled "Trauma-Informed Treatment Algorithms for Advancing Novel Outcomes" (Project TITAN) in Cambodian adults screening positive for Post-Traumatic Stress Disorder (PTSD). Prior treatment outcome research in Southeast Asia provided some support for the benefits of stabilization techniques (e.g., relaxation training) with large reductions in PTSD symptoms consistent with greater than 90\% remission rates during treatment.\textsuperscript{20} The Mekong Project delivers stabilization techniques (ST) with exposure-based Eye Movement Desensitization and Reprocessing (EMDR) treatment as the local standard of care for Cambodians with PTSD and other mental health disorders.

Project TITAN partnered with community mental health clinics in Phnom Penh to examine the feasibility, acceptability, and preliminary efficacy of behavioral activation (BA) with ST (BA+ST) compared to ST alone in Cambodians diagnosed with PTSD. The primary objective of Project TITAN is to determine if individuals randomized to BA+ST benefit from BA+ST compared to ST alone. Findings from Project TITAN will guide the scalable implementation of culturally relevant, trauma-informed interventions in Cambodia and other LIMCs.

**Methods**

**Study Design**

Project TITAN is a stepped care RCT where participants are randomized to receive ST with or without BA over 6 sessions to improve symptoms of PTSD, comorbid mental health
conditions (e.g., depressive symptoms), and substance use. Regardless of experimental condition, all participants who do not achieve clinical remission of PTSD symptoms after 6 sessions of BA+ST or ST alone will begin EMDR treatment, the standard of care for the collaborating community clinics. Treatment outcomes are assessed at two- and four-months post-randomization. See Figure 1 for an overview of the study design.

**Figure 1.** Project TITAN Study Design

![Study Design Diagram](image)

**Figure 1.** Flow chart of study process from screening through final follow-up assessment.

Study visits occur in-person at the community-based mental health clinics. Sessions are conducted by Khmer-speaking mental health professionals with master’s degree training in clinical psychology and counseling who are employed by community-based mental health clinics. The clinicians have extensive experience implementing psychological treatments, including ST and EMDR (e.g., Mekong Project\(^\text{21}\)) for both clinical and research applications.
Participants receive 40,550 KHR ($10 USD) at each study visit. The study design was approved by the University of Missouri – St. Louis Institutional Review Board (IRB), the University of Miami IRB, and the National Ethics Committee for Health Research of the Ministry of Health in Phnom Penh. Project TITAN is registered on ClinicalTrials.gov (NCT 04304378).

Participants

We will enroll 160 Cambodian adults residing in and around Phnom Penh. The sample will be comprised of three groups of individuals with PTSD: 1) 40 sexual and gender minority (SGM) people; 2) 40 female entertainment and sex workers (FESW); and 3) 40 heterosexual, cisgender men and 40 women without a history of commercial sex work. The first two subgroups were selected based on results from prior studies that report high rates of trauma and PTSD in these populations.22-25

Inclusion/Exclusion Criteria

Inclusion criteria include: 1) 18 years of age or older; 2) meet diagnostic criteria for PTSD with a score >31 on the PTSD Checklist for DSM-5 (PCL-5);26,27 3) speak Khmer as their primary language; and 4) able to provide informed consent. Participants are excluded if they have active psychosis or if they meet criteria for severe alcohol or substance use disorder as identified by a score >27 on the Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST).28

Recruitment

Participants are recruited from local agencies in Phnom Penh and surrounding provinces, including non-governmental organizations that provide services to SGM and FESW communities. Additional recruitment occurs through regional health clinics and hospitals, and from those seeking clinical services at the community-based mental health clinics. Interested individuals are provided with a brief description of the study purpose and screening procedures. Following verbal consent, initial eligibility screening is conducted by phone or in-person to
assess trauma exposure and symptoms of PTSD via the Primary Care PTSD Screen for DSM-5 (PC-PTSD-5).  

**Enrollment and Assessments**

Those who screen positive for PTSD using the PC-PTSD-5 are scheduled for a baseline enrollment visit to determine final eligibility. At this visit, potential participants receive detailed information regarding assessment, randomization, and intervention procedures. Written informed consent is obtained. A member of the study team administers a series of questionnaires that capture demographic information, symptoms of PTSD, depression, anxiety, and substance use, condomless sex, and exposure to violence.  

See Table 1 for the list of measures included in the baseline and follow-up assessments. Eligible participants are scheduled for the first intervention session at the end of the baseline enrollment visit.

**Table 1.** Project TITAN Measures

<table>
<thead>
<tr>
<th>Assessment Measures (Baseline, 2 Months, 4 Months)</th>
<th>Demographics</th>
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<tr>
<td></td>
<td>Distress Thermometer&lt;sup&gt;30&lt;/sup&gt;</td>
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<td>WHO Incident Violence Exposure Scale</td>
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<td>Posttraumatic Stress Checklist-5 (PCL-5)&lt;sup&gt;26,27&lt;/sup&gt;</td>
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<td>Depression, Anxiety, and Stress Scale (DASS-21)&lt;sup&gt;31&lt;/sup&gt;</td>
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<td>Generalized Anxiety Disorder-7 (GAD-7)&lt;sup&gt;32&lt;/sup&gt;</td>
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<td></td>
<td>Patient Health Questionnaire-9 (PHQ-9)&lt;sup&gt;33&lt;/sup&gt;</td>
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<td>Differential Emotion Scale (DES): Shame and Guilt</td>
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<td></td>
<td>Cambodian Symptom and Syndrome Inventory (CSSI)&lt;sup&gt;34&lt;/sup&gt;</td>
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<td>Sexual Risk Behavior</td>
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<td>Alcohol, Smoking, and Substance Use Involvement Screening Test (ASSIST)&lt;sup&gt;28&lt;/sup&gt;</td>
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After two months, participants complete a follow-up assessment, during which symptoms of PTSD, depression, anxiety, and substance use are re-assessed. Clinical remission of PTSD is defined as a score ≤31 on the PCL-5.\textsuperscript{26,27} Individuals who achieve remission complete weekly phone or text “check-ins” for 6 weeks. Those who do not achieve remission by the two-month assessment are scheduled for 6 sessions of EMDR. The rationale for selecting EMDR as the second treatment step is that ST (described in Stepped Care Approach: Stage 1) is typically implemented prior to the “core” techniques of EMDR (i.e., bilateral brain stimulation).\textsuperscript{35} Finally, all participants complete a four-month follow-up assessment, at which time symptoms of PTSD, depression, anxiety, and substance use are re-assessed.

Retention

Several efforts are made to retain enrolled participants through the four-month assessment. Multiple sources of contact information are collected at the baseline visit in the instance that one of these sources becomes unusable during trial participation. Additionally, study staff maintain communication with recruitment sites to help locate participants who are lost to follow-up. The study team attempts to collect follow-up assessment data from all participants regardless of whether they complete the interventions.

Randomization

Randomization to one of two experimental conditions (detailed below) occurs immediately after the baseline visit. Participants are assigned to treatment group via stratified randomization with randomly permuted block sizes of 2, 4, and 6. Stratification is based on population (i.e., SGM, FESW, all others) to ensure balanced representation across the two arms. There is no blinding of participants, treatment providers, or study team members.

Stepped Care Approach: Stage 1

Participants are initially randomized to receive either: 1) ST; or 2) BA+ST. Both experimental conditions consist of 6 sessions. ST has been successfully implemented in Cambodia utilizing a culturally tailored approach to treat PTSD in adults.\textsuperscript{20,36} ST sessions focus
on providing skills for coping effectively with trauma-related symptoms (e.g., flashbacks, dissociation, or somatic symptoms) through provision of a safe therapeutic relationship, psychoeducation, relaxation training, and resource activation. Resource activation includes a number of strategies to decrease negative affect associated with the trauma and increase positive affect and feelings of control. As example, clinicians may suggest that individuals employ a visualization exercise called the “container technique” to “lock up” traumatic memories. Alternatively, individuals might visualize an environment that evokes comfort and safety.

The second treatment arm is comprised of BA+ST. The goal of BA is to increase time engaged in pleasurable activities to cope with symptoms of negative affect and avoidance that are prominent in people with PTSD. BA is an evidence-based treatment for depressive disorders. Preferred activities are selected by participants to ensure cultural and personal relevance. Strategies to foster engagement in the selected activities include self-monitoring, planning and scheduling of daily activities, rating the degree of pleasure and accomplishment experienced during chosen activities, exploring alternative behaviors related to achieving goals, and using role-play during sessions to address barriers. The ultimate goal of BA is to increase engagement in activities that provide opportunities to experience pleasure or a sense of mastery in order to improve negative affect. The rationale for adding BA to ST is based on the high rate of comorbid depressive symptoms among individuals with PTSD and the known effectiveness of BA to improve depression severity. Additionally, BA is highly adaptable to individual interests, which is critical for optimizing cultural relevance.

Stepped Care Approach: Stage Two

Participants who do not achieve clinical remission by the two-month assessment begin EMDR, which utilizes bilateral sensory engagement (visual or tactile) to facilitate mental processing of traumatic experiences. EMDR follows a sequential framework targeting: 1) past memories, 2) present symptoms, and 3) future actions. Participants are asked to identify:
1) a visual image associated with a traumatic event, 2) a negative belief about self, and 3) related emotions and somatic sensations. Additionally, participants identify a desired positive belief and rate how true this belief feels for them. Participants then focus on the image, negative beliefs, and somatic sensations while the clinician completes a standardized protocol incorporating bilateral sensory engagement. The goal of each session is to decrease emotional and physical symptoms that are perceived as distressing and to increase the validity of the desired positive belief. Throughout treatment, participants maintain a log of self-calming activities utilized in times of acute psychological distress (e.g., flashbacks) as well as progress toward achieving treatment goals.

**Fidelity Monitoring**

Fidelity monitoring is accomplished using a multi-tier process. Counselors at the community-based mental health clinics, all of whom complete training in the study protocol, receive weekly peer support and clinical supervision from senior therapists based onsite with additional ad hoc support from US investigators. Case notes are reviewed by a senior clinician in Cambodia to determine “agreement” with the protocol. Evidence of deviation is recorded for further review, and feedback regarding protocol fidelity is reported to the study team where necessary.

**Outcome Measures**

**PCL-5.** The PCL-5 is a 20-item self-report measure that assesses symptoms of PTSD consistent with the DSM-5. The PCL-5 has been utilized in international trauma research including work conducted in Cambodia. The scale provides scores on four subscales (Intrusion, Avoidance, Negative Cognitions and Mood, and Hyper-arousal) and a total score. Participants rate the severity of each symptom in the past month on a 5-point Likert scale from 0 (“Not at all”) to 4 (“Extremely”). The PCL-5 is completed at the baseline, two-month, and four-month assessments and during even numbered treatment sessions.
Distress Thermometer.\textsuperscript{30} The Distress Thermometer is a self-report, single-item instrument that measures distress via a Likert scale. Participants rate their distress in the past week on a scale of 0 (“No Distress”) to 10 (“Extreme Distress”). Data from the Distress Thermometer is collected at the baseline, two-month, and four-month assessments.

Depression, Anxiety, and Stress Scale (DASS-21).\textsuperscript{31} The DASS-21 is a 21-item self-report questionnaire that measures symptoms of depression, anxiety, and stress in the past week. The measure has been used in international research in Asia,\textsuperscript{47} including two recent studies in Cambodia.\textsuperscript{48,49} Participants rate each item on a Likert scale from 0 (“Did not apply to me at all”) to 3 (“Applied to me very much or most of the time”). The DASS-21 yields scores on three subscales (depression, anxiety, and stress) ranging from 0 to 42 (“Normal” to “Extremely severe”) and a total score ranging from 0 to 120. The DASS-21 is administered at the baseline, two-month, and four-month assessments.

Generalized Anxiety Disorder-7 (GAD-7).\textsuperscript{32} The GAD-7 is a 7-item scale of anxiety symptoms. Participants are asked to identify how often they experienced specific symptoms of anxiety over the last two weeks on a Likert scale from 0 (“Not at all”) to 3 (“Nearly every day”). The GAD-7 yields a total severity score ranging from 0 to 21. Prior work using the Khmer translation of the GAD-7 yielded a Cronbach alpha of .85, indicating strong internal reliability and consistency.\textsuperscript{50} Participants complete the GAD-7 at the baseline, two-month, and four-month assessments.

Patient Health Questionnaire-9 (PHQ-9).\textsuperscript{33} The PHQ-9 is the depression module of the Patient Health Questionnaire (PHQ), a self-administered version of the PRIME-MD\textsuperscript{51} diagnostic instrument for common mental disorders. The questionnaire includes 9 items rated on a Likert scale from 0 (“Not at all”) to 3 (“Nearly every day”), yielding a total severity score ranging from 0-27. The PHQ-9 has previously been translated into Khmer, revealing excellent internal consistency with a Cronbach alpha of .86.\textsuperscript{50} The PHQ-9 is administered at the baseline, two-month, and four-month assessments. In the instance a participant endorses suicidality on the
PHQ-9, a clinician conducts a safety assessment to determine the potential need for referral to inpatient care.

**Cambodian Symptom and Syndrome Inventory (CSSI).** The CSSI assesses somatic and cultural syndromes commonly reported by Cambodian individuals with a history of trauma but not adequately captured by western measures of PTSD. Participants rate their degree of agreement with each symptom over the past four weeks on a Likert scale from 0 ("Not at all") to 4 ("Extremely"). The CSSI generates somatic and syndrome subscale scores as well as a total score. The CSSI is completed at the baseline, two-month, and four-month assessments.

**Alcohol, Smoking, and Substance Use Involvement Screening Test (ASSIST).** The ASSIST assesses lifetime and past three-month use of tobacco, alcohol, cannabis, cocaine, stimulants, sedatives/sleeping pills, hallucinogens, inhalants, opioids, and “other” drugs. The ASSIST yields a score from “lower” to “high” risk for each substance. The ASSIST is completed at the baseline, two-month, and four-month assessments.

**Planned Analyses**

Data collection is facilitated in real-time using REDCap v 10.3.0. Data undergo quality assurance checks to ensure participants are assigned to the correct stratum (i.e., SGM, FESW, all others) and thus randomized appropriately. Data recorded on paper are double entered to guarantee accuracy. Data sharing is monitored by the investigators and the affiliated university representatives to ensure compliance with regulations, and a final de-identified dataset will be made available to the research community per the NIH Data Sharing and Management Policy (NOT-OD-21-013). Initial data analyses will examine distribution, skewness across dependent variables, multicollinearity, and need for covariates (e.g., demographics, substance use) to contrast outcomes across the two treatment arms.

The primary outcome is the proportion of participants who achieve clinical remission of PTSD at the four-month follow-up assessment using the PCL-5 questionnaire. We also will examine PTSD symptom burden between the two arms at the two-month follow-up, prior to...
initiation of EMDR for those who have not achieved remission of PTSD. Secondary outcomes include depression, anxiety, and substance use over four months. Additionally, we will conduct mixed model analyses with maximum likelihood estimation for group (i.e., BA+ST vs ST) by time (i.e., baseline, 2-month follow-up, 4-month follow-up). The significance level for treatment effects will be $p<0.05$, two-tailed, and a 95% confidence interval.

As an exploratory analysis, gradient boosted multivariate regression (GBM) will be utilized to identify predictors of treatment response vs. non-response as well as predictors of attrition. GBM is a form of ensemble machine learning based on a “wisdom of crowds” model that leverages information from both successful and unsuccessful learning trials. GBM achieves performance metrics that are similar to results from more computationally intense meta strategies such as Super Learner. Compared to other machine learning methods (e.g., support vector machines), ensemble machine learning is generally robust to overfitting, biases introduced by differences in the base rate of the targeted outcome variable, and restricted sample sizes.

Discussion

We describe herein the design of Project TITAN, a NIH-NIMH-sponsored RCT to examine culturally relevant treatment strategies for PTSD and comorbid mental health conditions. Project TITAN represents the first RCT in Cambodia to test the benefits of BA in conjunction with ST as a treatment for PTSD. Additionally, exploratory analyses using advanced machine learning methods have the potential to generate new insights into the individual, cultural, contextual, and clinical factors that, in combination, predict favorable vs. unfavorable treatment responses.

Characteristic of most resource limited settings, there is a significant mental health treatment gap in Cambodia, and this gap has been exacerbated by the intergenerational consequences of the Khmer Rouge genocide. The targeting of educated civilians, including researchers, physicians, and other health professionals, during the Khmer regime devastated...
an already vulnerable healthcare infrastructure needed to provide care to Cambodian adults with mental health conditions.

Prior research efforts focused on novel mental health interventions in Cambodia have not been incorporated into government-sponsored health policies and initiatives, which is essential for adoption and sustainability. Research that does not engage key stakeholders across these dimensions is unlikely to achieve transformative outcomes even if there is strong evidence of efficacy. To avoid potential barriers to implementation, Project TITAN investigators collaborated with key stakeholders in Cambodia prior to development of the RCT protocol. This work informed the selected Stage 1 treatment strategies, which have high cultural relevance and potential for uptake, scalability, and sustainability.

Eichfeld et al. demonstrated delivering ST achieves large reductions in PTSD symptoms during a short course of treatment. Although BA is an evidence-based treatment for depressive disorders, it holds substantial promise as a treatment for PTSD. BA+ST is readily adapted to the local culture and the individual and does not require extensive training of clinicians, which allows for greater dissemination and implementation guided by a community health framework. This is important for LMICs like Cambodia that do not have the same resources compared to HICs for delivery of mental health care.

Traditional interventions utilize exposure to process the traumatic event(s), which can be overwhelming to individuals seeking treatment. In contrast, BA+ST does not require the use of exposure. This is important as research indicates that attrition from PTSD treatment is high for protocols that emphasize exposure, particularly for those individuals with complex trauma or comorbidities. In lieu of exposure, BA targets symptom reduction vis-à-vis increased participation in desired and healthy activities. ST similarly focuses on an increase in positive affect and a reduction in negative affect via attention refocusing, imagery, and resource activation. If BA+ST shows promise in achieving meaningful reductions in symptoms of PTSD, this will provide an alternate treatment paradigm to exposure-based interventions. Subsequent
RCTs will test the effectiveness and scalability of BA+ST for optimizing PTSD outcomes in Cambodia using community health workers.

Project TITAN also provides an opportunity to inform the impact of BA+ST among SGM and FESW, two subpopulations with a high prevalence of PTSD and other mental health disorders. Both SGM and FESW report high rates of childhood sexual abuse, which is known to predict PTSD, depression, anxiety, and substance use disorders in adulthood. Additionally, FESW experience higher rates of abuse in adulthood, including intimate partner violence. These traumatic experiences are commonly compounded by intersectional stigma, resulting in an increased risk for chronic mental health conditions. A previous study demonstrates the efficacy of BA on reducing amphetamine use among sexual minority men, but no studies have examined the impact of BA or ST on PTSD among SGM or FESW. By optimizing recruitment of these priority populations, Project TITAN may help to establish BA+ST as a viable treatment option for the SGM and FESW communities that experience high rates of PTSD and other mental health disorders.

Project TITAN will employ machine learning to identify predictors of treatment response vs. premature treatment discontinuation or failure to achieve remission of PTSD. These exploratory analyses have potential to identify novel combinations of variables (e.g., age, education, adverse childhood events, severity of PTSD symptoms) at the initial visit and throughout treatment that identify participants who are unlikely to achieve clinical remission of PTSD or are at risk of premature discontinuation of treatment. Early identification of individuals who are at risk of attrition or failure to achieve remission is a critical first step towards precision medicine, in which treatment paradigms are adjusted to meet individual needs.

While Project TITAN has the potential to expand treatment options for Cambodians with PTSD, challenges in implementation are expected. First, the protocol launched in the COVID-19 era, and travel restrictions and social distancing requirements have potential to complicate participant recruitment and onsite engagement across stakeholders. To overcome this barrier
and to increase flexibility beyond the pandemic, telehealth options were added to the protocol and video conferencing platforms were implemented to support stakeholder engagement. Second, the clinicians involved in the RCT are required, per the study protocol, to administer a novel therapy rather than the evidenced-based treatment (i.e., EMDR) that they have been trained to deliver. This could put clinicians into an uncomfortable position, especially at later intervention sessions where they may be compelled to follow their clinical intuition to switch to their proven standard of care, which is against the RCT protocol. Nevertheless, we do not anticipate this will be a major concern in Project TITAN as the selected interventions have high cultural salience and acceptability as well as an empirical foundation of improved PTSD symptoms in other samples.

To our knowledge, Project TITAN is the first RCT to assess the efficacy of BA+ST as a treatment for PTSD. BA+ST is scalable and sustainable across a broad range of cultures. Furthermore, results from the planned trial have potential to inform treatment opportunities for populations with high prevalence rates of PTSD. Finally, the use of data-driven methods has potential to identify novel predictors of PTSD treatment outcomes. The expected results will guide development and implementation of clinical interventions for PTSD in Cambodia and other resource limited settings where the burden of mental illness is high.

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References


sexual risk behavior among adult men who have sex with men. Arch Sex Behav. 2015;44(7):1891-1902.


Abbreviations

ASSIST: Alcohol, Smoking, and Substance Use Involvement Screening Test
BA: Behavioral activation
CSSI: Cambodian Somatic Symptom and Syndrome Inventory
FESW: Commercial sex worker
DASS-21: Depression, Anxiety, and Stress Scale – 21 Items
EMDR: Eye movement desensitization and reprocessing
GAD-7: General Anxiety Disorder – 7
GBM: gradient boosted multivariate regression
HIC: High-income country
IRB: Institutional review board
LMIC: Low- or middle-income country
PCL-5: PTSD Checklist for DSM-5
PC-PTSD-5: PTSD via the Primary Care PTSD Screen for DSM-5
PHQ-9: Patient Health Questionnaire – 9
PTSD: Post-traumatic stress disorder
RCT: Randomized controlled trial
SGM: Sexual and gender minority
ST: Stabilization techniques
TITAN: Trauma Informed Treatment Algorithms for Novel Outcomes