Development and Evaluation of a Virtual Hope Box for Reducing Suicidal Ideation

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• “This work was in part supported by the Military Suicide Research Consortium (MSRC), Department of Defense, and VISN 19 Mental Illness Research, Education, and Clinical Center (MIRECC), but does not necessarily represent the views of the Department of Defense, Department of Veterans Affairs, or the United States Government. Support from the MSRC does not necessarily constitute or imply endorsement, sponsorship, or favoring of the study design, analysis, or recommendations.”
Since 2001, >1.5 million US military service members deployed in support of Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF).

- Traumatic Brain Injury
- Mental/Behavioral Health Problems
  - PTSD
  - Depression
  - Anxiety
  - Stress
  - Family/Social Dysfunction
  - Suicide

- 2010 DoD Suicide Event Report
  - 281 suicide completions confirmed
  - 863 attempts by 837 individuals
Cognitive Therapy (CT) & Dialectical Behavior Therapy (DBT):

- Suicidal patients are able to cite reasons for wanting to die, but they often find it challenging to think of and believe in reasons for living.

- CT/DBT teaches patients to identify desired outcomes and modify thoughts and behaviors to increase the likelihood of such outcomes.

- Aimed at redirecting the distressed individual’s attention towards reasons for living.

- Combined with stress-reduction techniques - relaxation and distraction.

- CT/DBT effective in managing suicidal patients.

Hope Box or Hope Kit

- Common component of CT and DBT.

- Physical representation of the patient’s reasons for living that the patient creates and customizes.

- Stores items that a patient can refer to during feelings of hopelessness.
  - E.g. favorite CD, family photographs, reminders of accomplishments and future aspirations, supportive messages from loved ones.
CDS’s Behavioral Risk Factor Surveillance System (BRFSS) 2009: Personal Cell Phone Use

- 74% non military
- 83% active duty service members
- 77% recent veterans

T2’s PTEC 2010: Personal Cell Phone Use

- 85% to 93% active duty service members
- 60% had downloaded free “apps”

Smartphone Apps 2012

- >300,000
- 8,000 health-related

Smartphone Apps for Psychological Health

- Approx 5,000 – 10,000
- Anxiety, depression, smoking, alcohol use, psychosis, diet, exercise, weight loss, nutrition, parenting, cognitive performance, relationships, relaxation, sleep, spirituality, and general wellbeing.

Army exploring plans to equip all service members with smartphones
DCoE’s National Center for Telehealth & Technology (T2)

Technology for Military Psychological Health & TBI

Population and Prevention Programs
Website development, surveillance tools, mobile applications

Innovative Technology
New and innovative technologies, including virtual reality and virtual worlds

Clinical Telehealth
Technologies for remote clinical care. Addresses health care access barriers (geography, mobility, and stigma).

Clinical Telehealth

DoD SER
DEPARTMENT OF DEFENSE SUICIDE EVENT REPORT
CALENDAR YEAR 2010 ANNUAL REPORT

Research, Outcomes, Surveillance, Evaluations
8 ongoing suicide research projects
At least 27 military psychological health and TBI apps planned, in development, or already publicly available

- **T2MoodTracker** - Enables users to create a personal graphical record of their post-deployment mood changes.
- **Breathe 2 Relax** - Demonstrates and guides deep breathing techniques to reduce stress.
- **Tactical Breathing Trainer** - Used to gain control over physiological and psychological responses to stress.
- **Mobile PE** - Allows PTSD patients undergoing prolonged exposure therapy to track the progress of daily homework exercises.
- **PTSD Coach** - An app to provide self-assessment, education, symptom management, and support information to Veterans and Active Duty personnel.
- **T2 Mobile Screener** - A portable self-assessment screening tool for measuring brief psychological "vital signs" symptoms in the field.
- **Provider Resilience** - An app to track and address provider burnout, compassion fatigue, and secondary traumatic stress.

**Virtual Hope Box**: Create a smartphone app containing essential elements of a hope box and associated components of CT/DBT for military service members and veterans in distress.
Virtual Hope Box (VHB) App for Smartphones: Rationale

1. Severe psychological problems leading to hopelessness and even suicide are impacting recently deployed service members and their families.

2. CT & DBT have shown promise in treating suicidality.

3. Therapeutic coping strategies often include use of hope box.

4. Hope box is key therapeutic component but physically unwieldy and inconvenient - often not available when patient needs it most during crises.

5. Rates of personal cellphone use among active and recently retired military personnel are extremely high - ubiquitous.

6. Because mobile devices such as smartphones are carried all the time, they can expand the reach of traditional therapeutic interventions.

7. A “Virtual Hope Box” (VHB) takes the common hope box practice and uses smartphone vehicle and features to enhance the access and experience.

8. Rich multimedia options on smartphone allow more varied options. Furthermore, smartphones are already common repository for user-generated and user-preferred media.

9. Service members are highly mobile. Suicidal crises most likely to emerge in absence of healthcare providers.

10. Smartphone-based app allows for easily personalized VHB that is highly portable and always available to a user in distress wherever they are.
Objective: To conduct a proof of concept development and evaluation of a virtual hope-box (VHB) smartphone app to supplement in-person clinical therapy for service members with suicide ideation or behavior.

We will develop and test the VHB app in two phases:

1. Phase 1: an initial prototype development followed by usability testing of the prototype to inform refinement of the app interface, functioning and content.
   - At T2/JBLM

2. Phase 2: a proof of concept pilot comparing acceptability and utility of the VHB with a conventional “physical” Hope Box (PHB) in clinical practice.
   - Dialectical Behavior Therapy (DBT) Program at the VAMC Portland Mental Health Clinic
   - High-risk-of-self-harm veterans entering DBT for Bipolar Disorder or PTSD
   - “Self-soothing box” currently used in distress tolerance module
Research Questions:

1. Can a smartphone app be developed that contains the essential elements of a hope box and associated components of CT/DBT in a package acceptable to and usable by military service members and veterans?

2. Is the prototype VHB app as usable, acceptable, convenient, and ostensibly useful as a conventional hope box to a clinical sample of service veterans at high risk of self-harm and suicide, and their providers.

Hypotheses:

1. The VHB will demonstrate high usability (e.g., easy to learn, efficient and convenient to use) with clinical outpatients in treatment for suicidal ideation

2. Patients will use the VHB more than a traditional “physical” hope box (PHB)

3. The VHB will demonstrate high patient acceptability and satisfaction.

4. Patients and their providers will prefer the convenience, easy utility, content richness, and hip-pocket portability of the VHB to the more static and cumbersome PHB
VHB Study: Phase 1- T2

VHB Design Specs & Functional Requirements

“Agile” Development of Prototype

Iterative Usability Testing in T2 TEC Lab
20 active duty soldiers

Review and Input from Portland VA DBT Clinic Study Staff

Final Modifications

Move to Phase 2

Developers and T2 Content Specialists

External Review
VHB Study: Phase 2 - Portland VA DBT Clinic

1. **Screening & Enrollment**
   - 10+ DBT Patients

2. **Baseline Assessments**

3. **Construction of 1st Hope Box (PHB or VHB)**

4. **1st Field Testing:**
   - PHB or VHB
   - 6-8 Weeks: Phone Interviews every 2 weeks

5. **Evaluation of 1st Field Test** & Final Assessments

6. **Construction of 2nd Hope Box (PHB or VHB)**

7. **2nd Field Testing:**
   - VHB or PHB
   - 6-8 Weeks: Phone Interviews every 2 weeks

8. **Evaluation of 2nd Field Test**

9. **Clinician Focus Group**

10. **2nd Hope Box Construction** (PHB or VHB)

In Clinic: Red
Away from Clinic: Green
VHB Study: Patient & Clinician Outcomes

**Baseline:**

**Background Questionnaire:** Standard demographical information + experience and proficiency with personal technology

**Thoughts, Feelings & Behaviors Questionnaire (TFB):**
- PHQ9
- Interpersonal Needs Questionnaire (INQ-12)
- Revised Suicide Ideation Scale (RSIS)

**Common Data Elements (CDE):** Compilation of selected items from well-established and standardized subclinical self-assessments questionnaires. The CDE will be used as a comparative baseline measure across a number and variety of future studies.

**During Hope Box Use:**

**Usage Semi-structured interviews** (every 2 weeks by phone). Frequency of PHB or VHB use, purpose of use, how it was actually used, whether goal was achieved.

**Electronic usage logs.** Encrypted and stored on phone to be downloaded.

**Follow-Up:**

**Thoughts, Feelings & Behaviors Questionnaire (TFB)**

**PHB Usability questionnaire & VHB Usability Questionnaire.** a) frequency of use; (b) ease of use; (c) functionality; (d) understandability; (e) overall impression; (f) recommendations for future modifications; (g) likelihood to use again; and (h) error and technical difficulties (VHB only).

**Clinical in-person debrief:** compare experiences using the PHB with the VHB, including preference of use and barriers or facilitators to use.

**Clinician Focus Group:** Clinician, RC and other staff perceptions of the VHB v PHB conducted by T2 staff.
T2 Virtual Hope Box

Focuses the user on cherished memories, reminders in digital media: Photos, videos, recorded messages, music.

Distraction pieces for the user: Activity Planner, and puzzles/word search games taken from user content.

Relaxation pieces, such as a deep breathing tool, progressive muscle relaxation, etc.

Preloaded inspirational quotes can be supplemented or replaced by personal quotes, family aphorisms, biblical phrases, etc.

User customized support contacts, hotline info.

Coping Cards highlight adaptive thoughts and behaviors when in crisis or managing problematic core beliefs.
Add supportive contacts from phone’s contact list or create new ones.
Add supportive, comforting, distracting, or relaxing audio, video, pictures, messages, inspirational quotes, or other media.
VHB: Support Contacts

Emergency Hotlines

- Bill Turney-Loos
- Sarah Froggy

Emergency hotlines

- 911
- Veteran's Crisis Line (En)
- Veteran's Crisis Line (Sp)
- DCoE Outreach Center
- DBT Pager (Skill Coaching)
VHB: Remind Me

Select from collection of media in multiple formats. Set Remind Me to shuffle display.
VHB: Relax Me

Selectable timing and duration for inhale, hold, and exhale
VHB: Distract Me - Games & Puzzles

Selectable levels of difficulty

Puzzle photos and words extracted from user content
Positive Events Scheduling

Hey all, would you like to have lunch with me on Wednesday, May 9 at 12:05pm?

Nigel Bush <l@gmail.com>, Josh Cohee <josh@gmail.com>,

Lunch at 12:05pm on Wednesday, May 9, 2012

Josh Cohee < 253
VHB: Coping Cards

Coping Cards - Edit

I can't take the pressure of work and school and kids.

Trapped, Erratic, Depressed

Positive Responses

This quarter is almost over.
My kids are the best.
I have a vacation coming up in two months.

Coping Cards

I can't take the pressure of work and school and kids.
Trapped, Erratic, Depressed

✓ This quarter is almost over.
✓ My kids are the best.
✓ I have a vacation coming up in two months.
You gain strength, courage and confidence by every experience in which you stop to look fear in the face.

*Eleanor Roosevelt*

Remember there's no such thing as a small act of kindness. Every act creates a ripple with no logical end.

*Scott Adams*