Technology-based Strategies for Adolescent Substance Abuse Prevention

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- I have no commercial relationships to disclose
- I will not be discussing any unapproved uses of pharmaceuticals or devices
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Presentation Overview

- Review major types of technology-based prevention strategies tested in substance abuse prevention
  - ➢Focus on those used in primary care - used by patients, not just providers
- Brief review of evidence base

Spectrum of Prevention Strategies

- Universal prevention: targets entire population, regardless of risk level
- Selective prevention: targets at-risk subgroups prior to initiation (e.g., those with risky families or peers)
- Indicated prevention: targets those in early stages of risk behavior to prevent further progression (early intervention)

Technology-Based Strategies Explored

Within the clinic setting

- Pre-encounter:
  - Screening (computer tablet/kiosk, phone-based interactive response)
  - Tailored computerized feedback and psychoeducation

Technology-Based Strategies, cont'd

- During encounter:
  - Clinician decision support: computer report of results; suggested guidance; follow-up recommendation
  - Clinician extender: computerized brief intervention

Technology-Based Strategy Types, cont'd

Beyond clinic setting (Clinician Extenders)

- Web-based education/intervention programs
- Text-messaging interventions
- Smartphone apps

Emerging strategies…

- Wearables/sensors
- Social media/networking sites

Recent review:

Technology-based Interventions for Preventing and Treating Substance Use Among Youth

Lisa A. Marsch, PhD*, Jacob T. Borodovsky, BA

KEYWORDS

• Youth • Substance use disorders • Prevention • Treatment • Technology

KEY POINTS

- Technology-based interventions are effective for preventing and treating substance use disorders.
- Technology is particularly suited to youth.
- Technology-based interventions are relevant at any stage in the development of a substance use disorder.
- Technology-based interventions provide solutions to extant problems of traditional interventions.

Child Adolesc Psychiatric Clin N Am 25 (2016) 755–768
http://dx.doi.org/10.1016/j.chc.2016.06.005

Computer-facilitated Screening and Brief Intervention (C-SBI)

- Marsch & Borodovsky (2016) found two published trials (Harris et al., 2012; Walton et al., 2013) of technology-based prevention strategies tested among adolescent primary care patients (more among college students)
- Used within clinic setting
- Could be universal or selective prevention (based on screen results)
- Both found significant reductions in use *initiation* during 12-months follow-up

Computer-facilitated Screening and Brief Advice (cSBA)

(Harris SK et al., Pediatrics, 2012)

- 5-minute tablet computer program with:
  - CRAFFT screener
  - Immediate feedback about score and risk-level
  - 10 interactive psychoeducational pages on health risks of substance use and related riding/driving risk
- Provider Report with screen results and ‘talking points’ to guide 2-3 minute discussion with teen

Harris SK et al., Pediatrics, 2012 Jun;129(6):1072-8220

cSBA Efficacy

- Tested in >2000 12-18 yr-old patients arriving for routine care at 9 clinic sites
- Compared to Treatment-as-Usual control, cSBA had…
  - Significantly lower overall self-reported alcohol use rates at 3 and 12 months follow-up
  - *Initiation* of alcohol use among baseline non-users reduced by 34% over 12 months

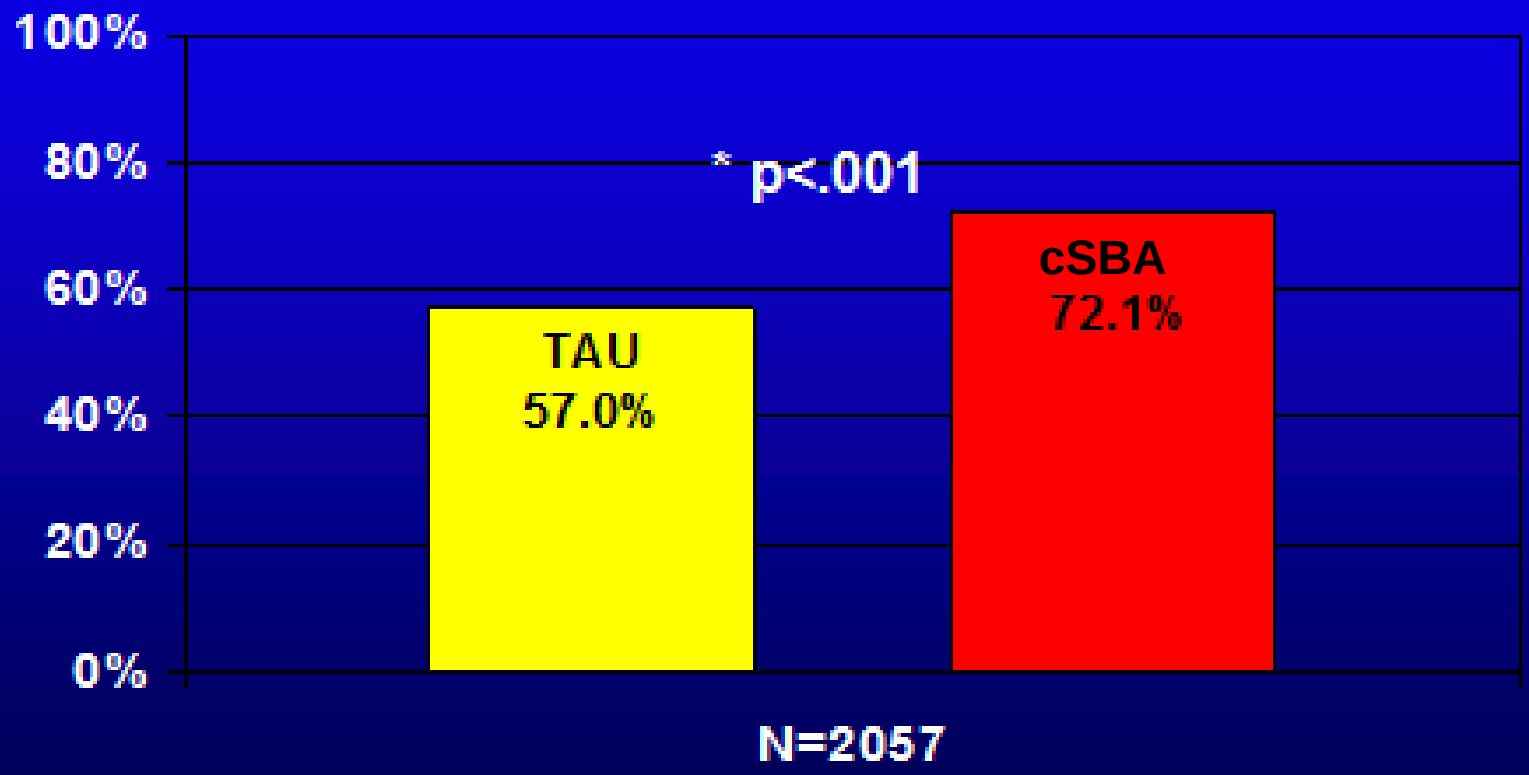
Harris SK et al., Pediatrics, 2012 Jun;129(6):1072-8220

These technology-based systems also have potential to increase patient ratings of care…

cSBA study (Harris et al., Pediatrics, 2012)

% Rating their Provider Excellent/Very Good

Computerized Screening, Brief Intervention, and Referral to Treatment (cSBIRT) vs. Treatment as Usual (TAU)



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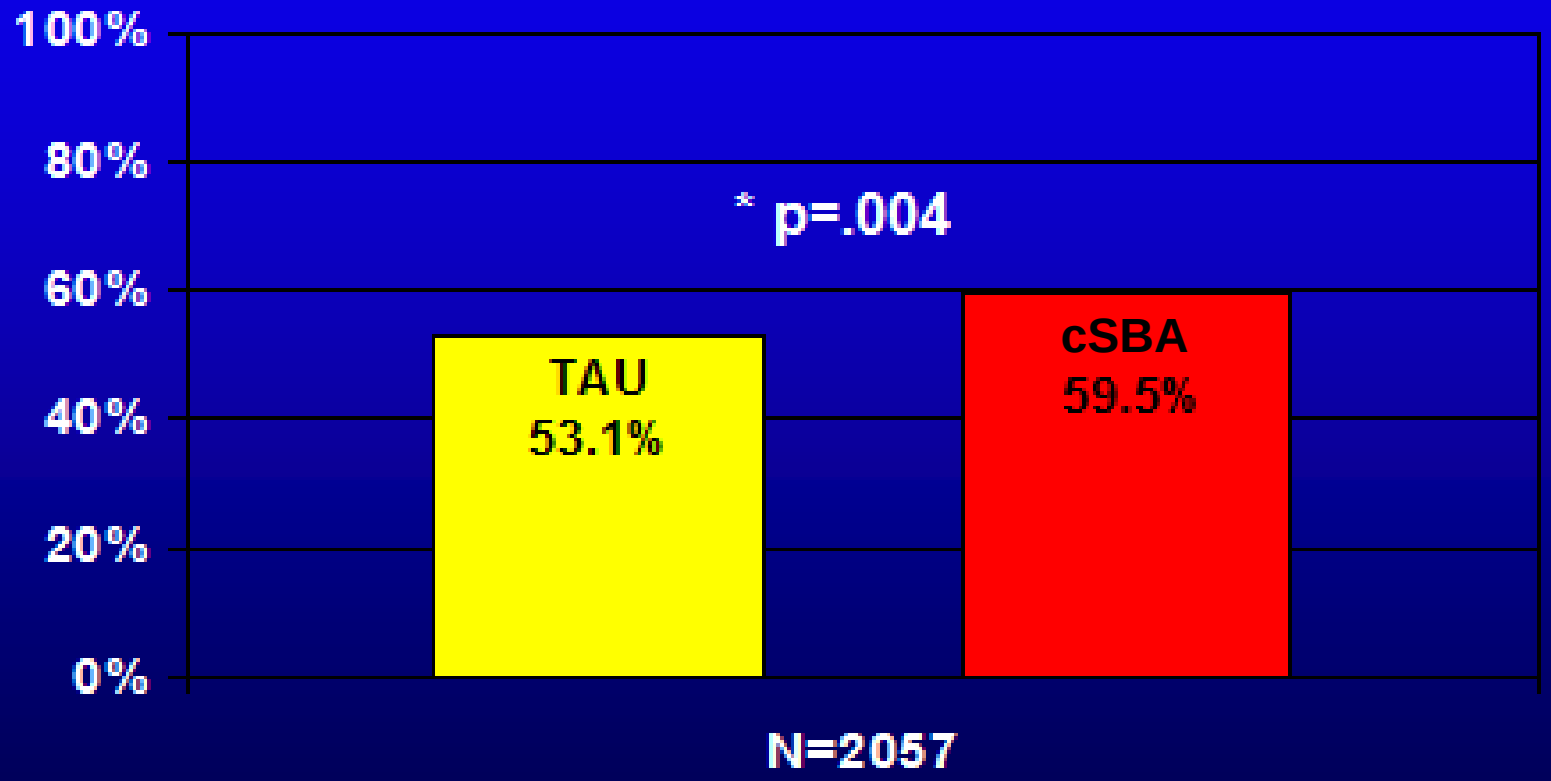
% Very Likely to Follow Provider's Advice

Computerized Screening, Brief Intervention, and Referral to Treatment (cSBIRT) vs. Treatment as Usual (TAU)



Computerized Brief Intervention for Preventing Cannabis Use

(Walton MA et al., Addiction, 2013)

- Project Chill: self-administered interactive tablet computer program
- Animated with audio (headphones), delivered by a virtual "therapist" (avg. time 33±13 min)
- Motivational Interviewing-based: identifying values/goals, personalized feedback, pros/cons of use, alternate activities, role-plays, summary of responses, community resource list

Walton MA et al., Addiction, 2013; 109:786-797

Project Chill Efficacy

- RCT conducted among 12-18 yr-old patients at 7 FQHC's
- Compared to "brochure" control, Project Chill…
  - Increased perceived risk of harm and refusal self-efficacy pre/immediate post
  - Reduced cannabis use initiation by 30% during 12-mo follow-up

Walton MA et al., Addiction, 2013; 109:786-797

Technology-Based Prevention Strategies for Substance Abuse – What do we know?

Addictive Behaviors 38 (2013) 1747–1756

Contents lists available at SciVerse ScienceDirect

Addictive Behaviors

Computer and mobile technology-based interventions for substance use disorders: An organizing framework

Erika B. Litvin *, Ana M. Abrantes, Richard A. Brown

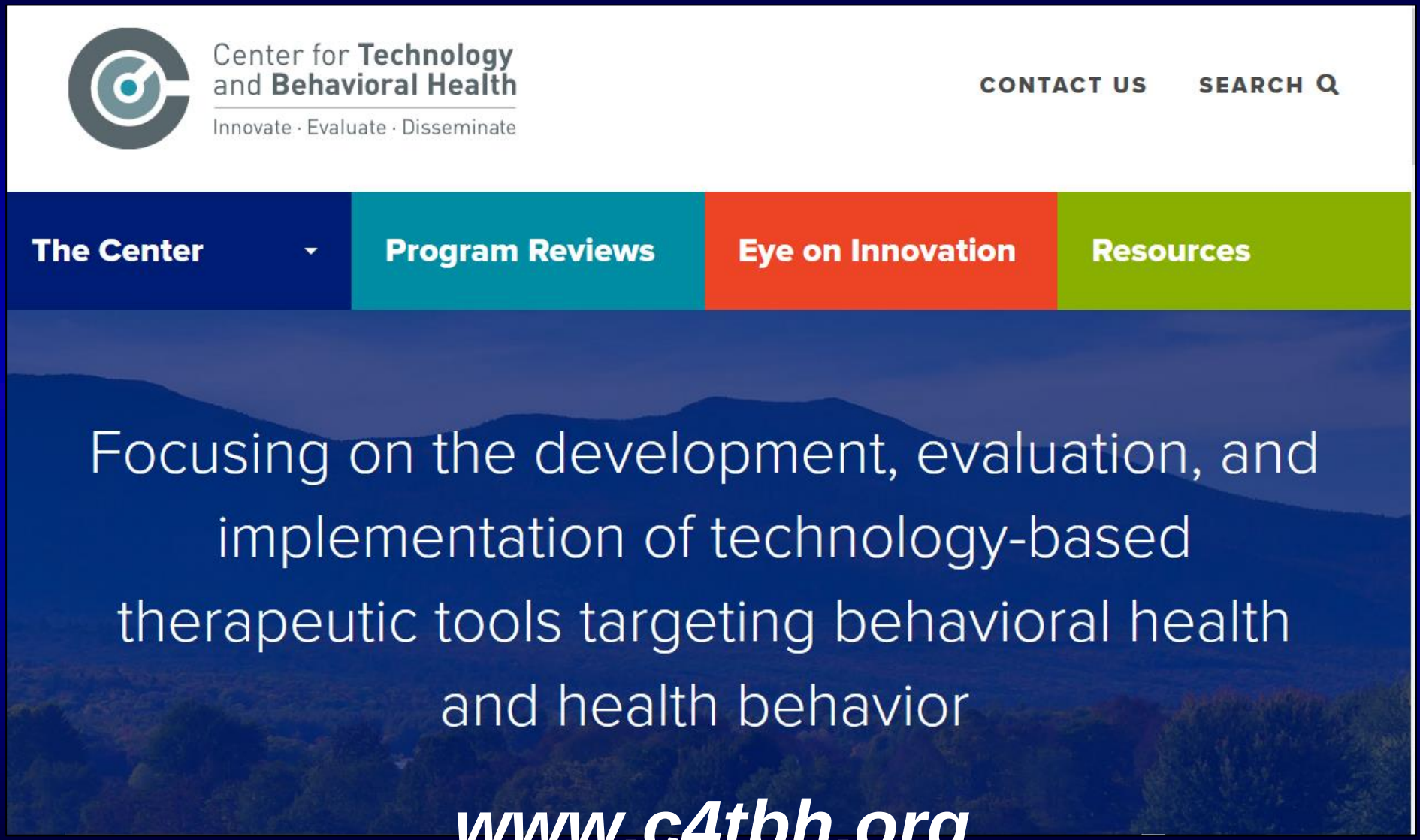
Department of Psychiatry and Human Behavior, Alpert Medical School of Brown University, Butler Hospital, 345 Blackstone Blvd., Providence, RI 02906, United States

Review findings
(Litvin et al., 2013)

- Research to date mostly on offline computer-based/text-messaging interventions; web-based and mobile intervention research still in infancy; almost none in social media/networks
- Few studies with teens (evidence stronger for adults, college students)
- Significantly better than minimal control conditions, but not other active in-person interventions
- Human Contact: some contact better than none
- On-site better than off-site

Slide courtesy of Dr. Alan Budney

A Good Resource



Gamification

- Uses game-design elements to leverage developmental opportunities in adolescence
- Focus on intrinsic motivation of narrative, participant agency & personalized experience
- Building competence through vicarious learning as well as mastery experiences re: knowledge, self-efficacy & skills

*I*ntelligent *N*arrative *S*ystem for *P*atient-*I*ndividualized *R*eflective *E*xploration

- Designing a self-adaptive personalized behavior change system for adolescent preventive health – focus on preventing & reducing risky alcohol use
- Integrates Social Cognitive Theory with artificial intelligence planning techniques & game technologies

Narrative Centered Behavior Change System for Adolescent Preventive Health

- Designed to link with primary care for prevention opportunities – communication with provider – "clinician extender"
- Series of primarily home based narrative episodes with character interactions & virtual worlds
- Iterative development with adolescents
- Multi-platform deployments