

Acceptability of a Web-Based Community Reinforcement Approach for Substance Use Disorders with Treatment-Seeking American Indians/Alaska Natives

Aimee N. C. Campbell · Eva Turrigiano · Michelle Moore ·
Gloria M. Miele · Traci Rieckmann · Mei-Chen Hu ·
Frankie Kropp · Roz Ringor-Carty · Edward V. Nunes

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Abstract Longstanding disparities in substance use disorders and treatment access exist among American Indians/Alaska Natives (AI/AN). Computerized, web-delivered interventions have potential to increase access to quality treatment and improve patient outcomes. Prior research supports the efficacy of a web-based version [therapeutic education system (TES)] of the community reinforcement approach to improve outcomes among outpatients in substance abuse treatment; however, TES has not been tested among AI/AN. The results from this mixed method acceptability study among a diverse sample of urban AI/AN ($N = 40$) show that TES was acceptable across seven indices (range 7.8–9.4 on 0–10 scales with 10 indicating highest acceptability). Qualitative interviews suggest adaptation specific to AI/AN culture could improve adoption. Additional efforts to adapt TES and conduct a larger effectiveness study are warranted.

Keywords American Indian · Alaska Native · Substance use disorders · Computer-assisted treatment

Introduction

American Indians/Alaska Natives (AI/AN) face disproportionately greater and persistent health disparities (Beals et al. 2005; Thomas et al. 2009; National Center for Health Statistics 2012), including higher rates of substance use disorders as compared to the U.S. general population (Compton et al. 2007; Hasin et al. 2007; Gone and Trimble 2012; Greenfield and Venner 2012; SAMHSA 2010, 2012). In 2010, 16 % of individuals that identified as AI/AN met criteria for a substance use disorder, compared to 10 % of the general population (SAMHSA 2012). Substance abuse has also been linked to poorer health outcomes among AI/

A. N. C. Campbell (✉) · G. M. Miele · E. V. Nunes
Department of Psychiatry, New York State Psychiatric Institute,
Columbia University College of Physicians and Surgeons,
1051 Riverside Drive, Room 3732, Box 120, New York,
NY 10032, USA
e-mail: anc2002@columbia.edu

A. N. C. Campbell
Department of Psychiatry, Mount Sinai St. Luke's, a
Member of the Mount Sinai Health System, New York,
NY 10025, USA

E. Turrigiano
Substance Abuse Division, New York State Psychiatric Institute,
1051 Riverside Drive, Room 3732, Box 120, New York,
NY 10032, USA

M. Moore
City/County Drug and Alcohol Program, 725 N Lacrosse Street,
Suite 300, Rapid City, SD 57701, USA

T. Rieckmann
Oregon Health and Science University, 3181 SW Sam Jackson
Park Road CSB 669, Portland, OR 97239, USA

M.-C. Hu
Mailman School of Public Health, Columbia University,
722 W 168th St, New York, NY 10032, USA

F. Kropp
University of Cincinnati/CinARC, 3210 Jefferson Avenue,
Suite 6, Cincinnati, OH 45220, USA

R. Ringor-Carty
Native American Rehabilitation Association of the Northwest,
1631 SW Columbia Street, Portland, OR 97201, USA

ANs compared to other American racial subgroups (Pleis et al. 2010; Indian Health Services (IHS) 2009; SAMHSA 2010). Further, and often related to high rates of substance use disorders, data suggest that AI/ANs also face higher rates of alcohol related deaths (Chartier and Caetano 2010; Russo et al. 2004; National Center for Health Statistics 2012), mental health disorders (National Center for Health Statistics 2012), suicide rates (National Center for Health Statistics 2012; Gone and Trimble 2012; Advancing Indian Health Care 2009), and lower AIDS survival rates (CDC 2012). The U.S. government has recently noted the disproportionately negative health consequences among AI/AN through the formation of the Office of Indian Alcohol and Substance Abuse in 2010. Thus, increasing targeted research to reduce substance-related health disparities is a critical national priority.

Numerous factors contribute to persistent health disparities among AI/AN, including limited access to health services (CDC 2010; Indian Health Services (IHS) 2009; SAMHSA 2011). AI/AN substance abuse treatment facilities [operated by Tribal government, Indian Health Service (IHS) or IHS identified programs, or facilities providing services in an AI/AN language] are predominantly located in rural areas (60 %), while only 22 % of the AI/AN population now reside in rural areas (Norris et al. 2012; SAMHSA 2009). Further compromising service delivery for AI/AN are the limited resources available to the IHS, with reported per capita health expenditures lower than Medicare, Medicaid, federal employees, and the Veteran's Administration (Roubideaux 2005; Whitesell et al. 2012). Recent research in California demonstrated that AI participants received less individual treatment and out of program services compared to their non-AI counterparts (Evans et al. 2006). Additional barriers to treatment for this population include: inadequate transportation; limited insurance coverage; low socioeconomic status; stigma related to substance abuse; discomfort in a "westernized" treatment delivery system; and a shortage of opioid treatment programs (Dickerson et al. 2011).

Given the deleterious effects of substance use disorders and significant barriers to accessing and receiving appropriate services, computer-assisted, web-delivered interventions could improve the quality and capacity of treatment services for AI/AN communities. Implementation of evidence-based substance abuse treatment interventions has been slow (McLellan et al. 2003; Lamb et al. 1998), with key barriers including the need for adequate staff and budget resources and re-training due to high staff turnover. Further, once therapists are trained, maintaining adequate adherence to the intervention requires ongoing monitoring and supervision. Computer-delivered interventions can address some of these barriers by allowing complex, evidence-based treatments to be delivered with

high fidelity and at a low cost without increasing demands on staff time or training (Carroll and Rounsaville 2010; Kiluk et al. 2011; Marsch 2012). Other potential advantages are that computer interactive programs may be less threatening to patients and provide greater anonymity, especially with sensitive or stigmatized issues such as sexual behavior and drug taking (e.g., Des Jarlais et al. 1999). Web-based technologies allow a user to access the intervention at a convenient time and place, providing greater flexibility. Finally, computerized interventions allow individuals to review necessary skills, concepts, and other therapeutic activities at their own pace and for greater amounts of time than would be possible with a therapist alone (Bickel and Marsch 2007; Newman et al. 1996). There is a limited, but growing science base for technology-based interventions to treat substance use disorders. Several randomized trials provide support for the efficacy of computer-assisted technology for addiction treatment (Bickel et al. 2008; Budney et al. 2011; Carroll et al. 2008, 2014; Chaple et al. 2014; Gustafson et al. 2014; Kay-Lambkin et al. 2011; Marsch et al. 2014), including a multi-site effectiveness trial using the same intervention as the current study (Campbell et al. 2014).

Most evidence-based practices for treatment of substance abuse have not been examined among AI/AN communities—urban, rural or reservation-based (Gone and Looking 2011; Lucero 2011; Thomas et al. 2009). More specifically, there is a significant shortage of culturally relevant interventions that can be integrated into treatment program curricula (Dickerson et al. 2011; Greenfield and Venner 2012). However, local, state, and national funding streams have recently become predicated on programs offering evidenced-based practices. Thus, substance abuse providers that serve AI/AN clients face considerable challenges to providing culturally relevant, research-supported treatments.

The community reinforcement approach (CRA; Budney and Higgins 1998) has extensive support as an intervention for individuals with alcohol and other drug use disorders (Budney and Higgins 1998; Smith et al. 2001). However, there is little published research on the acceptability or efficacy of CRA among AI/AN communities (NIAAA 2002). CRA is grounded in the idea that drugs compete with more delayed prosocial reinforcers; thus, the treatment promotes skills training to teach, encourage, and increase satisfaction with drug-free sources of reinforcement (Budney and Higgins 1998). The current pilot study aimed to assess the acceptability of an efficacious web-based version of CRA, the therapeutic education system (TES; Bickel et al. 2008; Marsch et al. 2014; Campbell et al. 2014), which was developed for mainstream, substance abuse treatment seekers, among urban AI/AN clients at two outpatient treatment programs. The goals of the study were

to: (1) explore the extent to which TES would be acceptable to urban AI/AN treatment seekers in its current form; (2) assess the association between AI/AN ethnic identity and TES acceptability; and (3) determine what type of intervention modification might be warranted to increase acceptability.

Methods

Study Sites

The study was conducted at two urban outpatient substance abuse treatment programs affiliated with the National Institute on Drug Abuse Clinical Trials Network (CTN). One treatment program was located in the Northern Plains region; the second in the Pacific Northwest. The majority of clients served by both programs identified as AI/AN. The study staff followed principles of the Community Based Participatory Research (CBPR; Davis and Reid 1999; Israel 2000) approach which emphasizes equal partnerships, building community capacity, and long-term commitment to the community. CTN research centers have ongoing relationships and collaborations with both of these programs, promoting bi-directional communication, engagement, and trust among stakeholder groups and increased efficiency and quality of research efforts. AI/AN clinical researchers and the clinical and administrative staffs at the two treatment programs provided consultation during proposal development on issues pertaining to training, recruitment and assessment and were active collaborators throughout the study process by providing guidance on implementation, feedback on interpretation of data, and participation in manuscript development.

Participants and Study Design

Eligible participants were men and women, 18 or older, who self-identified as AI/AN, and were within the first 30 days of their treatment episode. Twenty participants were recruited from each of the two programs January–May of 2011 (N = 40). Research staff approached clients individually or through announcements in treatment groups, briefly informed them about the purpose of the study, and asked if they were interested in participating. Interested clients completed a brief screen to assess eligibility (with verbal consent), followed by full study consent and a baseline assessment. Participants then completed 8 weeks of web-based TES using onsite computers. A follow up assessment, including a qualitative interview, was completed 1 week after the intervention phase.

The study was approved by the New York State Psychiatric Institute Institutional Review Board (IRB), the University of Cincinnati IRB and the Portland Area Indian Health Service IRB prior to study initiation and monitored annually during the trial. There are no known conflicts of interest and all authors certify responsibility for this manuscript.

Intervention

Participants received access to the therapeutic education system (TES; Bickel et al. 2008; Campbell et al. 2012) on computers at their respective treatment programs. TES addresses substance use in general and is able to individualize the various substance use-related problems with which patients may present. The TES program is self-directed so no prior computer experience is required. Participants had access to 32 interactive, multimedia modules

Table 1 Modules of the therapeutic education system, a computer-delivered, interactive program for treatment of substance use disorders

Training module	What is functional analysis?
Conducting a functional analysis	Self-management planning
Introduction to problem solving	Effective problem solving
Drug refusal skills training	Seemingly irrelevant decisions
Coping with thoughts about using	Awareness of negative thinking
Managing negative thinking	Managing thoughts about using
Managing negative moods and depression	Decision-making skills
Increasing self-confidence in decision-making	Introduction to assertiveness
How to express oneself in an assertive manner	Introduction to giving criticism
Steps for giving constructive criticism	Receiving criticism
Giving and receiving compliments	Communication skills
Nonverbal communication	Social recreational counseling
Attentive listening	Sharing feelings
HIV and AIDS	Sexually transmitted infections (STIs)
Sexual transmission of HIV and STIs	Drug use, HIV and hepatitis
Identifying/managing triggers for risky sex	Identifying/managing triggers for risky drug use

or topics (see Table 1) considered core to the CRA approach. Topics included basic cognitive behavioral relapse prevention skills (e.g., drug refusal skills, managing thoughts about drug use, conducting functional analyses and self-management planning), skills aimed at improving psychosocial functioning (e.g., vocational and employment skills, family/social relations, financial management, communication skills, management of negative moods, time management and recreational activities), and content related to the prevention of HIV, Hepatitis and other sexually transmitted infections (STIs). The first module is a training module that teaches participants how to use the system (e.g., provides an overview of the goals of TES, how TES is organized, how to respond to questions on the computer, etc.). Video clips within some modules show actors modeling the skills being taught. Short quizzes at the end of each module assess participant's grasp of material; the pace and level of repetition of material is adjusted accordingly to maximize individual mastery of the skills and information being taught.

Participants were asked to complete four modules per week over the 8 weeks of treatment, ideally at two different visits during the week. These visits were typically linked to patients' attendance at treatment as usual within the program. Two computers were available for use during usual treatment program hours; research staff were onsite and available for assistance and support. TES has a back-end system that tracks participant activity. Thus, participant access to TES was documented and used to assess TES exposure. Each module took approximately 15–20 min to complete and modules were completed in the same order for all participants to enhance consistency of delivery in this acceptability study.

Measures

Demographic Variables

Participant demographics and other characteristics were obtained at screening and baseline and included age, gender, race/ethnicity, tribal affiliation, education, marital status, employment, and internet use. Frequency of internet use was assessed for the prior 30 days.

Substance Use

The Timeline Follow-back method (TLFB; Sobell and Sobell 1992) was used to obtain self-report days of alcohol and other substance use (cocaine, opiates, amphetamines, methamphetamines, benzodiazepines, barbiturates, oxycodone/oxycotin, methadone, and marijuana) in the 30 days prior to baseline. The TLFB has good psychometric properties, including test–retest measurement with multiple populations (Sobell and Sobell 2000).

Cultural/Ethnic Identity

Ethnic identity was assessed using The Scale of Ethnic Experience (SEE; Malcarne et al. 2006). An assessment of ethnic identity was used to determine the extent to which study participants identified with their AI/AN culture and heritage. The SEE contains 32-items on 5-point Likert-type scales that measure the experience of ethnicity across four dimensions: ethnic identity; perceived discrimination; mainstream comfort; and social affiliation. Ethnic identity reflects a person's attitude toward being a member of their ethnic group, ethnic pride and participation in cultural activities. Perceived discrimination reflects how a person perceives their ethnic group is treated in the U.S. Social affiliation reflects a person's preference and comfort for interaction with their own ethnic group compared to other groups. Mainstream comfort was developed as a proxy for assimilation: that is, a person's perception of comfort with U.S. mainstream culture. Higher scores on the subscales indicate greater endorsement of the construct. The SEE was developed for individuals of any ethnic background. Internal consistency reliability of the scale with the current sample was adequate ($\alpha = 0.72$ – 0.82 across the four domains). Several additional questions from the Addiction Severity Index-Native American Version (Carise and McLellan 1999) were also included to capture participation in AI/AN activities and residence on reservations. These measures were completed at baseline only.

Intervention Acceptability

Acceptability of the TES intervention was based on three pre-specified outcomes: proportion of participants who agree to participate (i.e., number enrolled divided by the number approached); number of modules completed (range 0–32); and quantitative participant feedback following completion of each module. A participant feedback survey was completed on the computer immediately following the completion of each module. Participants rated each module on a Likert-type scale ranging from 0 to 10 (anchored from “not at all” to “very much”) consisting of seven question indices: (1) interesting, (2) easy to understand, (3) useful, (4) extent to which the intervention provided novel information, (5) satisfaction, (6) relevance, and (7) how much the participant liked it.

A semi-structured interview was conducted with each participant as part of the 1-week post treatment assessment. The interviews consisted of seven core questions with follow up probes to elicit specific information about TES acceptability in terms of content, material, and delivery, including relevance to AI/AN heritage and culture. The interview was digitally recorded and later transcribed for data analysis purposes.

Data Analysis

Means, standard deviations, and percentages were used to describe the sample on descriptive characteristics. Similarly, means and standard deviations were calculated for each “acceptability” indicator for each module, as well as an overall mean and standard deviation for each module (across all seven indicators). Associations of the mean acceptability of the five highest and five lowest rated TES modules with the high/low median splits of SEE subscales were analyzed using the non-parametric Wilcoxon significance test. The purpose of the latter analysis was to determine if theoretically informed ethnic identity constructs influenced level of acceptability among AI/AN. A median split was used given that the mean scores of the scale are not readily interpretable. These analyses were conducted using SPSS version 18.

Generalized linear models (using identity link function for normal data) on module acceptability were applied to examine the associations among the order of module completion (continuous, 2–32), the phase of intervention completion (i.e., earlier: modules 2–16 vs later: modules 17–32) and overall acceptability ratings among (1) whole sample and (2) those that completed more than half the modules (>16). These analyses were conducted using PROC GLIMMIX in SAS 9.3.

Qualitative interviews were digitally recorded, transcribed, and entered into Atlas.ti v5.1[®] for the purpose of coding and analyzing text. A codebook was developed prior to data collection representing general themes of interest that corresponded with the interview guides. Two interviews were initially reviewed and coded by all members of the qualitative analysis team (comprised of three research team members and two staff from the treatment programs, one of whom was AI/AN). An iterative process of discussion and review of code definitions and application was used to reach consensus and finalize the codebook. Two team members then coded the remaining interviews and again the analysis team met to review final codes and discuss content found within each of the themes.

Results

Sample Characteristics

Forty participants were enrolled in the study, 20 at each treatment program. Twenty-six participants (65 %) completed the 1-week post treatment follow up assessment and interview. The mean age was 37.5 ($SD = 10.9$) years, and about half of the sample was women (47.5 %). The vast majority reported alcohol as the primary substance of abuse (77.5 %), followed by methamphetamines (10.0 %),

opiates/heroin (7.5 %), and cannabis (5.0 %). The mean number of days of alcohol and drug use in the past 30 was 2.5 ($SD = 7.6$); 80 % of the sample reported 0 days of drug and alcohol use in the past 30. Over half reported a high school degree or equivalent (57.5 %), 25.0 % had less than a high school degree, and 17.5 % greater than a high school degree. About one-third of the sample reported working full or part-time in the prior month (35.0 %) and almost half (47.5 %) were under or unemployed.

Most participants reported living on a reservation at some point in their lives (72.5 %) and almost half were familiar with their native language (47.5 %). Slightly over half (55.0 %) accessed the internet at least once in the month prior to study enrollment and 42.5 % of the sample accessed the internet at least once per day. The following means were found using the Scale of Ethnic Experience, with higher scores indicating greater endorsement of the concept (range 1–5): ethnic identity $M = 3.78$ ($SD = 0.7$); perceived discrimination $M = 3.44$ ($SD = 0.6$); mainstream comfort $M = 3.35$ ($SD = 0.7$); and social affiliation $M = 3.06$ ($SD = 0.7$).

TES Acceptability: Proportion Enrolled and Module Completion

Sixty-eight clients were approached for the study and 40 enrolled (58.8 %). All but three participants completed at least one module. Of those that completed modules, the mean number was 18.6 [*Standard Deviation* (SD) = 9.2], with a range of 4–32.

TES Acceptability (Quantitative Indicators)

Participants reported the following mean ratings for each acceptability indicator (range 0–10; higher scores indicated greater acceptability): 8.33 ($SD = 2.1$) interesting; 8.54 ($SD = 1.9$) usefulness; 8.26 ($SD = 2.2$) new information; 8.49 ($SD = 1.9$) satisfaction; 8.39 ($SD = 2.2$) relevance; 8.22 ($SD = 2.2$) likability; and 7.43 ($SD = 3.5$) understanding. Each individual TES module was also rated for overall acceptability, again on a scale from 0 to 10. No modules received an overall mean rating of less than 6, the a priori score for indicating definite need for adaptation. The division at the midway point of the scale (<5 vs. 6 or greater) allows for a general alignment with one of the endpoints for each question (e.g., not interesting vs. very interesting). The lowest rated module was Self-management Planning ($M = 7.76$) and the highest was Drug Use, HIV, and Hepatitis ($M = 9.39$) (see Table 2).

There was no significant difference detected in module ratings up through module 16 based on whether participants completed more than half or less than half of the modules (see Fig. 1). Further, there was not a significant

Table 2 Five lowest and five highest rated modules of the therapeutic education system with means on each acceptability indicator and overall mean and standard deviation of module acceptability

Module name	N	Interesting	Useful	New info	Satisfaction	Relevance	Likeability	Understand	Overall
<i>Lowest rated</i>									
Self-management planning (#4)	32	7.91	8.44	8.22	7.78	8.44	7.41	6.16	7.76 (1.8)
Coping with thoughts about using (#9)	31	8.16	8.19	8.00	8.10	7.71	7.71	6.81	7.81 (2.0)
What is functional analysis? (#2)	33	8.09	8.48	8.48	8.21	8.30	7.91	5.42	7.84 (1.6)
Introduction to problem solving (#5)	31	8.03	8.35	8.10	8.39	7.97	8.06	7.03	7.99 (1.7)
Decision-making skills (#14)	24	8.04	8.04	8.21	8.04	8.04	7.58	7.21	7.88 (2.4)
<i>Highest rated</i>									
Receiving criticism (#20)	19	8.95	9.47	8.89	8.74	9.32	8.84	9.00	9.03 (1.3)
Manage triggers for risky sex (#31)	8	9.63	9.63	9.38	9.38	9.00	9.25	7.75	9.14 (1.5)
Sexual transmission of HIV/STIs (#29)	8	9.38	9.38	9.38	9.38	9.25	9.25	8.75	9.25 (1.4)
Manage triggers for risky drug use (#32)	8	9.50	9.63	9.25	9.50	9.63	9.25	8.00	9.25 (1.4)
Drug use, HIV, and hepatitis (#30)	8	9.50	9.50	9.50	9.50	9.50	9.50	8.75	9.39 (1.2)

Acceptability scores range from 0 (worst) to 10 (best)

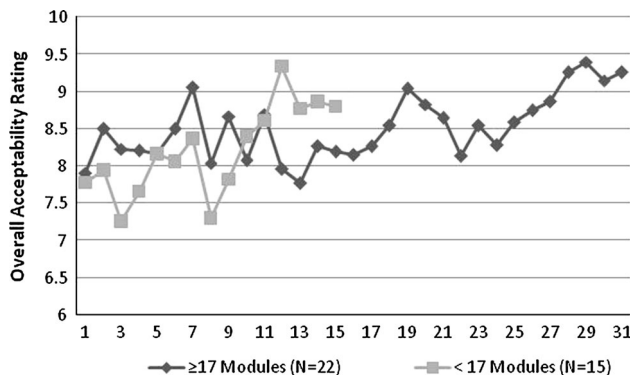


Fig. 1 Overall module acceptability rating among participants with fewer than 17 modules completed versus 17 or more modules completed of the therapeutic education system

increase in module acceptability ratings over time for modules 2–16 among the total sample. Finally, of those who completed more than half of the modules ($n = 22$), acceptability for the first half (2–16) was significantly lower than for the second half (modules 17–32) ($b = 0.242$, $se = 0.108$, $t\text{-value} = 2.25$, $p = .025$). *TES Acceptability by Ethnic Identity.* Table 3 displays associations between domains of the Scale of Ethnic Experience (dichotomized as high versus low) and overall acceptability among the five lowest and five highest rated modules. Participants with greater perceived discrimination rated the Receiving Criticism module lower ($z = 2.45$, $p = .014$) and participants with greater mainstream comfort rated Self-management Planning higher ($z = 1.97$, $p = .049$). There were no other significant associations detected.

TES Acceptability (Qualitative Interviews)

Two primary themes emerged when examining in-depth interviews. First, participants found TES information relevant to addiction treatment and recovery (endorsed by 21 of 26 participants). This overall acceptability of relapse prevention and other cognitive skills training was noted by several participants: “Well, being able to deal with drug and alcohol addiction. I think that’s apparent in any culture though.” and “Everything that was in these modules were things—I mean, there was something in each one of them I did not know.” The content appeared to complement outpatient substance abuse treatment curricula and provided new information that participants had not received previously, especially content related to HIV and other STI prevention.

The second main theme that emerged was that TES could be improved through better AI/AN representation within module content and presentation (endorsed by 16 of 26 participants). This was summarized by one participant: “I didn’t think it was culturally specific. But when you say culture, I think of sweat lodges, I think of ceremonies, I think of powwows, I think of drumming and singing. Culturally, I don’t see it.” Another participant put forth that “...some Natives will only receive the information if it’s about us or for us, you know? Maybe they’ll put it off because they’re just thinking it’s another way the White man’s trying to tell us how to do things, but if it’s about Natives, maybe we’ll accept it more and use more of it and take it as a tool [...]”

Specific suggestions supplied within the interviews included: (1) inserting humor, Native words or slang, and

Table 3 Associations between high versus low ethnic identity on four domains of the Scale of Ethnic Experience and acceptability of TES modules, examining overall means of acceptability from the five highest and lowest rated modules

Module	N	Social affiliation			Ethnic identity			Perceived discrimination			Mainstream comfort		
		High	Low	Z ^a	High	Low	Z ^a	High	Low	Z ^a	High	Low	Z ^a
		M	M		M	M		M	M		M	M	
<i>Lowest rated</i>													
Self-management planning (#4)	32	7.96	7.43	1.04	8.03	7.32	0.98	7.67	7.89	0.00	8.44	7.00	1.97*
Coping with thoughts about using (#9)	31	7.78	7.86	0.10	7.75	7.89	0.38	7.46	8.37	1.41	7.55	8.12	0.68
What is functional analysis? (#2)	33	7.88	7.80	0.27	8.01	7.62	0.88	8.09	7.51	0.75	8.05	7.57	0.86
Introduction to problem solving (#5)	31	8.40	7.43	1.47	8.12	7.81	0.12	8.24	7.65	0.58	8.02	7.96	0.16
Decision-making skills (#14)	24	7.47	8.57	0.88	8.09	7.46	0.03	7.27	8.90	1.90 ⁺	7.70	8.01	0.09
<i>Highest rated</i>													
Receiving criticism (#20)	19	9.01	9.06	0.00	8.65	9.55	1.22	8.39	9.90	2.45*	9.27	8.81	0.30
Manage triggers for risky sex (#31)	8	9.57	6.14	1.50	9.40	8.71	0.00	8.71	9.86	0.34	9.14	9.14	0.00
Sexual transmission of HIV/STIs (#29)	8	9.57	7.00	1.50	9.40	9.00	0.00	8.83	9.95	0.34	9.37	9.05	0.00
Manage triggers for risky drug use (#32)	8	9.59	6.86	1.73 ⁺	9.43	8.95	0.39	8.80	10.0	0.98	9.37	9.05	0.00
Drug use, HIV, and hepatitis (#30)	8	9.59	8.00	1.14	9.43	9.30	0.00	9.03	10.0	0.98	9.60	9.05	0.39

* $p < .05$; ⁺ $p < .10$ ^a Nonparametric Wilcoxon tests

storytelling; (2) using Native actors in videos and for voice over; (3) references to and depictions of nature and the natural world; (4) scenarios for the videos that were more relevant to AI/AN experience (one participant described the, “use of native themes in scenes when in the home such as Native art and such”). One participant suggested showing a video about returning to the reservation to visit family, confronting and dealing with alcohol and drug use; (5) incorporating Native spirituality, especially as it relates to effective coping. Examples of spirituality included prayer, sweats, singing, and drumming; and (6) removing specific content that might be counter to Native culture. For example, a video clip in TES suggests using direct eye contact when refusing drugs; this was seen as opposite to many AI/AN cultures that rely more heavily on non-verbal communication and view direct eye contact as disrespectful. A participant more generally explained “...a lot of times people would think communication just comes from [...] your mouth, but it also comes with your body language and your eye contact, and that pretty much speaks louder than what’s coming out of your mouth.”

Discussion

This study offers important information about the acceptability of an efficacious, web-based intervention among AI/AN clients receiving outpatient substance abuse treatment. Although alcohol and drug abuse disproportionately impact AI/AN communities, very few evidence-based treatments have been developed or adapted for AI/AN clients. Given

the rural locations of many Indian reservations, as well as treatment accessibility issues facing urban-dwelling AI/AN peoples, a web-based treatment offers compelling advantages and benefits.

Overall findings suggest that core TES content is acceptable among a diverse AI/AN client population who agreed to participate in this study. AI/AN clients gave the highest ratings of acceptability to TES modules that included HIV/STI information, as well as managing triggers that can lead to risky sexual or drug using behavior. It may be that this information was not widely available within their treatment programs, a conclusion supported via anecdotal conversation with research staff. Modules receiving lower ratings tended to be those completed earlier; lower ratings may reflect features of TES functionality, such as getting comfortable with the interface and answering questions to demonstrate learning to be able to move from one module to the next. Initial, lower acceptance rates (and the relatively low use of the internet in the population at baseline) may indicate that web-based interventions need more comprehensive introduction.

Earlier modules also included topics on functional analysis (analysis of sequences of thoughts, feelings and events leading up to episodes of substance use) and managing thoughts about using alcohol and illicit substances and urges to use. Specific details of these modules, such as person and place triggers may have been less culturally relevant or appeared more didactic. Since participants were early in their treatment episode, these topics may not have corresponded to their readiness to make changes. Alternatively, given the high 30-day abstinence rates of the

sample, these early relapse prevention topics may have been less relevant or useful. Higher ratings for later modules could reflect early attrition by individuals who were less likely to find TES acceptable. However, this was not borne out in analyses examining module acceptability among those who completed less than or more than half the modules. Research staff noted that most individuals who did not complete the research study also had left the treatment program, corroborating this quantitative finding. This would suggest a lack of interest or motivation in substance abuse treatment overall, rather than a specific reaction to the web-delivered treatment.

Only one module, Functional Analysis, received a low score (6) on the acceptability measure “easily understood.” This module walks clients through a multi-step analysis of events or emotions that can trigger relapse/substance use. It is relatively dense in terms of information and may contain off-putting academic “jargon.” TES modules are deliberately ordered based on the accumulation of specific cognitive behavioral skills, so placing functional analysis later in the order is not recommended. Thus, this particular module should be reviewed for more specific modification and possible cultural adaptation.

Findings specific to the qualitative data suggest that moderate adaptation would improve acceptability and engagement in TES among AI/AN clients. Users might relate to the content more easily if video clips and voice-over narration are more representative of AI/AN culture. As others have noted, services for AI/AN that marry traditional or cultural practices, such as strengths-based cultural assets, with evidence-based addiction treatments produce better effects (Dickerson et al. 2011; Etz et al. 2012; Kropp et al. 2013). Adaptation of existing treatments, however, must take into account that AI/AN communities are diverse—with over 280 separate cultural groups representing 560 tribes (Gray and Nye 2001; Bureau of Indian Affairs 2010). Thus, adaptation either needs to account for differences in AI/AN culture with regard to health disparities, access to resources, geography, culture, tradition, exposure to post-colonial trauma and issues related to substance abuse (Thomas et al. 2011) or be more generic in terms of providing the faces, voices and elements of culture and spirituality that could resonate across tribal affiliations. Overall, increasing cultural congruency and compatibility could lead to stronger acceptability and treatment program adoption within AI/AN communities and programs serving large numbers of urban AI/AN, enhancing the ability of clients to integrate information into their daily lives.

Few significant relationships emerged between AI/AN cultural identity, as measured by the Scale of Ethnic Experience, and the acceptability of TES. This may in part be due to the limited sample size in this pilot study and the

relatively limited variability in module ratings. Further, because these were exploratory analyses, corrections for multiple tests of association were not applied but should be considered when thinking about implications of these findings. Acceptability of Self Management Planning was significantly related to higher Mainstream Comfort, i.e., feeling assimilated into American culture. This module might particularly benefit from adaptation to increase acceptability among more traditional or less assimilated AI/AN people. Of interest, Receiving Criticism was rated higher among those who endorsed greater perceived discrimination. This module may have presented useful coping strategies for individuals who perceive or experience more discrimination.

The Scale of Ethnic Experience demonstrated good internal consistency reliability in this sample, comparable to that in African American, Caucasian American, Filipino American and Mexican–American groups who participated in the scale development studies (Malcarne et al. 2006). These pilot results suggest that Scale of Ethnic Experience may have potential for further use in AI/AN studies of ethnic identity and experience and additional research is warranted.

Limitations

This study was innovative in its attempt to assess the acceptability of an efficacious, web-based psychosocial intervention among an underrepresented population in substance abuse research. However, findings should be interpreted in light of several limitations. First, the sample was diverse, representing 19 distinct tribal affiliations. Although this demonstrates acceptability of TES across a diverse sample, the findings may not be generalizable to all AI/AN or to any one AI/AN tribal group. Second, 1-week post treatment follow up rates (70 %) were comparable to other substance abuse research studies, however conclusions should be tempered by the attrition, which could bias the findings. Efforts to track treatment dropouts were limited given staffing resources. Similarly, clients that were not interested at all in the study (i.e., did not agree to the initial screening assessment) may be different and possibly less likely to find a computer-assisted, web-delivered intervention acceptable. Third, participants accessed the intervention onsite; this study is not able to assess how frequently participants would have accessed the intervention using offsite computers. Finally, associations between ethnic identity and module acceptability may be underpowered due to modest sample size. That said, the inclusion of an ethnic identity measure, especially one with multidimensional cultural domains, is a strength of the current study and indicates further promise for more widespread use of this web-delivered treatment.

Conclusion and Future Direction

Ensuring AI/AN communities have access to culturally appropriate and acceptable evidence-based substance abuse treatment is long overdue, especially in light of the impact that substance abuse has had in this population (Dickerson et al. 2011) and the increasing demands on programs to implement empirically supported treatments. Findings from this pilot study suggest that core TES content and web-delivery format are acceptable among a diverse AI/AN client population receiving treatment in urban settings. The findings also suggest acceptability could be improved (and perhaps better integrated and utilized) if the content included representation of traditional practices, culture, and Native peoples. Although TES was not culturally tailored to a specific racial or ethnic group, adaptation to enhance relative advantage (i.e., degree to which a new intervention is perceived to be superior to the current practice) and compatibility (i.e., consistency with program values and perceived need) has been shown to enhance the likelihood of adoption and implementation (Rogers 2003). Findings suggest that moderate adaptations of TES are indicated related to delivery and presentation (e.g., casting the intervention in a Native voice by using AI/AN actors for voice and video components; use of stories as opposed to “academic” presentations; inclusion of AI/AN cultural representation). These adaptations could very likely be completed while maintaining fidelity to the core theoretical underpinnings of CRA. The content itself was generally experienced as relevant and well accepted with a few exceptions, such as the meaning and use of direct eye contact. Future research should incorporate questions specific to cultural relevance as part of acceptability.

An evidence-based intervention that is web-based and culturally-informed could address barriers to treatment access and dissemination among AI/AN communities, given its ease of implementation, limited staff training (given constricted resources), and flexibility in how TES is integrated into program curricula (Novins et al. 2011). Future research should focus on a collaborative, community-based adaptation process between intervention developers/researchers, treatment providers, and AI/AN community stakeholders. Future research should also target key implementation factors such as provider attitudes, funding (including reimbursement for non face-to-face services), and broadband internet access, including the availability and uptake of smart phone technology, in rural or reservation-based treatment programs.

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