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A Mobile App to Promote Alcohol and Drug SBIRT Skill Translation Among Multi-Disciplinary Health Care Trainees: Results of a Randomized Controlled Trial

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Abstract

Background—Adherence to clinical practice guidelines for alcohol and drug screening, brief intervention, and referral to treatment (SBIRT) is often inadequate. Mobile apps developed as clinical translation tools could improve the delivery of high fidelity SBIRT.

Methods—This study tested the effectiveness of an SBIRT mobile app conceptually aligned with the Theory of Planned Behavior (TPB) to support SBIRT delivery by health care trainees (nursing, social work, internal medicine, psychiatry, and psychology) working in clinical settings (N=101). Bivariate analyses examined the rate of SBIRT delivery between trainees assigned to the experimental (app) and control (no app) study conditions; as well as the relationship between TPB-based constructs, intention to deliver SBIRT, and screening rates.

Results—No significant differences were identified between the study conditions in SBIRT delivery. Significant correlations were found between intent to screen and TPB variables including attitudes/behavioral beliefs concerning substance use treatment (r=.49, p=.01); confidence in clinical skills (r=.36, p=.01); subjective norms (r=.54, p=.01) and perceived behavioral control over appointment time constraints (r=.42, p=.01). Also significant were correlations between percent of patients screened and confidence (r=.24, p=.05); subjective norms (r=.22, p=.05) and perceived behavioral control (r=.28, p=.01).

Conclusions—The negative results of the study condition comparisons indicate the need for further investigation of strategies to optimize mobile app utilization, engagement, and effectiveness as a clinical translation tool. Findings of significant correlations between substance

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use screening rates and both norms and confidence support the potential value of the TPB model in explaining behavior of health care learners in SBIRT delivery.

Keywords

SBIRT; Clinical Translation; App Development; Digital Behavior Change Intervention

Introduction

Broad deployment of evidence-based clinical strategies to address substance misuse is a public health imperative.[1,2] Screening, Brief Intervention and Referral to Treatment (SBIRT) is an accepted and widely-trained, multidisciplinary approach to screening and timely intervention for substance misuse. Substantial funding from the Substance Abuse and Mental Health Services Administration (SAMHSA) facilitated SBIRT training across health care settings in the United States.[3] Data from SBIRT training projects have demonstrated post-training increases in learner's SBIRT knowledge and confidence, as well as associated increases in SBIRT implementation.[4,5] However, concerns regarding sustainable clinical translation of high-fidelity SBIRT practice persist.[6,7] Studies demonstrate inadequate adherence to clinical practice guidelines for substance use screening and intervention and overall decreases in post-training SBIRT implementation over time.[8–13] Frequently cited barriers to SBIRT delivery include low practitioner motivation and confidence, as well as system level constraints, most notably time pressure and competing clinical priorities.[6, 14–16]

Sustaining clinical translation of high-fidelity SBIRT may necessitate on-going support and training that addresses individual clinician needs across health care disciplines.[17–19] SBIRT delivery involves a distinct skill set that trainees and novice practitioners may be less accustomed to employing, specifically, universal substance use screening using validated measures, motivational interviewing, and the coordination of effective referrals to treatment. Addressing the key barriers of skill confidence and motivation for SBIRT delivery is essential in clinical practice environments where significant time pressures and competing priorities are common.

Mobile technology is increasingly utilized to augment health professional education and clinical skill translation.[20–23] The primary advantages of mobile technology include greater accessibility compared to textbooks and online programs and the capacity to interface with the learner within the context of real-time clinical practice.[24] Available data support the efficacy of mobile technology, including mobile apps, in the reinforcement of didactic learning and the translation of clinical skills.[25–27] However, there is still much to learn about the effective use and design of mobile technology to support evidence-based clinical practice. Evaluations of the effectiveness of mobile apps to improve clinician adherence to clinical practice guidelines using rigorous analytic measures are limited. Also, the majority of available digital tools have been designed with a focus on information input and output without application of an underlying foundation in behavioral theory. Although still limited, digital behavior change interventions (DBCIs) developed to support personal behavior change are more likely to incorporate behavioral theory than clinical support tools.[24] Behavioral science theoretical frameworks may also be useful in the development

of more effective mobile technologies to support clinical skill translation and provide a framework for predicting and understanding clinician behavior.

The Theory of Planned Behavior (TPB) is a conceptual model that predicts a wide range of behaviors and identifies targets for behavior change interventions.[28] The TPB posits that behavior is directly predicted by intent; and that intent is determined by attitudes and behavioral beliefs (about the target behavior), subjective norms, and perceived behavioral control (see Figure 1). Key SBIRT translation barriers of motivation, confidence, and time constraints are captured in the TPB model as attitude, behavioral intent, and perceived behavioral control.

This randomized controlled trial (RCT) tested the effectiveness of a mobile app on SBIRT clinical skill translation outcomes among multidisciplinary health professions trainees who already received didactic SBIRT instruction. The mobile app used in this trial was designed with the TPB as a conceptual model for development, clinical application and evaluation. The research team hypothesized that use of the mobile app among health professions trainees would increase both behavioral intent and actual delivery of SBIRT in clinical placement settings.

Methods

Study design

The study was an RCT of a novel mobile app provided as a DBCI to facilitate SBIRT skill translation from didactic learning to clinical training among multidisciplinary health professions trainees. The SBIRT app was designed with three primary functions corresponding with TPB constructs: 1) Review SBIRT skills (knowledge and beliefs), 2) Apply SBIRT (attitude, confidence, and perceived behavioral control) 3) Report SBIRT delivery (social norms). The “skill review” function, mapped to the TPB constructs of knowledge and beliefs, provides information on the epidemiology of substance use disorders (SUD), SUD screening, DSM-5 SUD diagnostic criteria, and an overview of SBIRT delivery. The “apply” function is a point of care tool that provides alcohol and drug use screeners, brief intervention strategies, motivational interviewing tools, and referral to treatment tips. The “apply” function mapped to the TPB constructs of attitude, confidence and perceived behavioral control in SBIRT delivery. The report function collected data on app usage, SBIRT delivery, and study outcome data relevant to TPB constructs. A “tools” function on the app included a learner SBIRT skill development checklist, a social connection portal for the distribution of messages between participants, an SBIRT use leaderboard that allowed learners to assess individual SBIRT delivery in relation to other participants, and a technological support function. The app “report” and “tools” functions together mapped to the TPB social norms construct. No patient data were collected on the app nor used in the study analyses. Details regarding the mobile app design have been previously published.[29,30] The app is available free of cost for android and iOS devices under the name OHN (Open Health Network) SBIRT.

Following classroom and online instruction regarding the epidemiology of substance misuse and related health problems, SBIRT principles, and core screening and intervention skills,

participants were randomized to either the intervention condition (use of the SBIRT app) or the control condition (no access to the app). Participants completed weekly self-report measures on SBIRT delivery over the 10-week study duration. Pre- and post- intervention TPB surveys were administered to examine TPB constructs related to SBIRT delivery in the clinical setting. The study was conducted in two 10-week cohorts; one cohort in Fall 2016 and the second in Spring 2017.

Setting

The study was conducted among six health professional training programs at three universities: San Francisco State University (Social Work and Nursing), University of California, San Francisco (Internal Medicine and Psychiatry), and University of San Francisco (Nursing and Clinical Psychology). The San Francisco State University and the University of San Francisco samples included graduate level clinical nurse specialist (CNS) and nurse practitioner (NP) trainees. The Institutional Review Boards at each of these three universities approved the study procedures.

Participants

Study participants (n=131 enrolled at baseline, of whom 101 provided outcome data) were health professions trainees from one of the designated training programs. Participants were required to have completed classroom or online SBIRT training within the past year, needed to have a personal mobile device (android or iOS), and could not have previously used an SBIRT app. Participants without previous SBIRT instruction completed online training modules developed by the research team. To participate in the study, trainees were required to be enrolled in a clinical training placement. Clinical training placements included health care and social service agencies in the San Francisco Bay Area. Placements were arranged for trainees in accordance with standard procedures for each training program.

Recruitment and randomization

The research team identified faculty at participating training programs who were currently teaching SBIRT or willing to integrate SBIRT into their curriculum. Faculty permission was obtained to recruit study participants from within these classes. A detailed information sheet that specified expectations, timing, and types of data to be collected was provided to prospective participants within the classroom setting of consenting faculty. Prospective participants were informed that the choice to participate (or not) or outcomes of the intervention would have no effect on their grades or program progression. An invitation to participate was distributed via email to absent trainees. University of California, San Francisco School of Nursing participants were recruited through the School of Nursing newsletter. Participants provided written informed consent to participate either in person during classroom settings, or via email.

Randomization was conducted by the project study manager using variable block size randomization with a 1:1 allocation to the intervention or control condition. Trainees were assigned a study identification number then a web-based randomization tool was used to generate condition assignments. Randomization was stratified by training program in order

to have an even distribution of trainees in the intervention and control conditions from each program (See Figure 2).

Intervention condition

Intervention participants were instructed to download the app onto their mobile device and asked to use the app during their clinical training placements. Trainees had the opportunity to use the app as much as needed to review SBIRT, receive guidance on structured steps in SBIRT delivery, and receive tailored recommendations to improve their SBIRT practice. Trainees were encouraged to use the app during patient encounters and as a general reference tool outside of direct patient care as needed.

Control condition

Control participants completed didactic SBIRT training but did not download or use the mobile app. Control participants had access to online SBIRT modules and were encouraged to use self-study to improve their SBIRT skills. Upon completion of the study, controls were invited to download and use the app as desired.

Incentives

All participants received incentives to motivate app usage (in the intervention group) and questionnaire completion (all participants). Amazon gift cards were distributed throughout the study: $20 at baseline, $2.50 for each completed SBIRT usage weekly questionnaire, and $20 at the end of the study for answering final questionnaires. Maximum payment was $65 plus participation in a $50 gift card lottery based on the number of completed SBIRT usage questionnaires.

Data collection

At baseline, all participants answered a TPB-based SBIRT questionnaire via a Qualtrics link (control) or directly on the app (intervention). At the end of each week, all participants were asked to respond to a brief Qualtrics survey by phone text or email about SBIRT usage. Upon completion of the study period, participants were asked to repeat the original TPB-based SBIRT questionnaire and to provide general feedback about the app usage (intervention) or their general satisfaction with SBIRT (control). Data on app downloads and time spent using the app within the control group was tracked through the app.

Measures

Descriptive information regarding participants included their profession (nursing, social work, internal medicine, psychiatry, psychology) training institution, and whether or not they had previous SBIRT training.

SBIRT Questionnaire—A 21-item SBIRT questionnaire based on the TPB model was developed by the research team. Likert-scaled items with response choices ranging from 1 to 5 assessed attitudes and beliefs including the clinical significance of substance misuse and treatment modalities, importance and efficacy of SBIRT, and perceived patient willingness to participate in SBIRT. Three items assessed confidence in the respondents' ability to

deliver the three components of SBIRT: screening, a brief intervention and referrals; and one item assessed intent to perform SBIRT "whenever possible in my clinical/field placement". Assessment of subjective norms included the perceived expectations and practice standards of supervisors and peers. Perceived behavioral control was assessed by the perception of workplace support, specifically the adequacy of time allotted to deliver SBIRT. Participants were asked to complete this questionnaire at baseline and again at 10 weeks. Baseline TPB subscale reliability Cronbach's alpha scores for SBIRT attitudes/ behavioral beliefs (12 items) was .80; confidence in ability (3 items) was .90; and subjective norms (4 items) was .56. Perceived behavioral control was assessed with a single item pertaining to adequate time to perform SBIRT in the clinical setting. Participant questionnaire items per TPB construct are provided in Table 1.

SBIRT Utilization—At the end of each week, participants were sent a Qualtrics link (via email or text) asking them to report the total number of patients they had seen in the preceding week. Participants were then asked how many of those patients they screened for alcohol, drug or tobacco use, how many they did a brief intervention with, and how many they either referred to a specialty substance use treatment clinic or discussed with their clinical supervisor. Results of these responses were averaged over 10 weeks.

System Usability and Time Spent Using the App—Intervention group participants completed the System Usability Scale (SUS) measure at follow-up. The SUS is a 10-item Likert scale instrument that yields a single score ranging from 0–100.[31] Average usability is designated by a score of 68. Total amount of time in minutes that each participant used the app was tracked by the app developers' analytics program and then averaged.

Analyses

Descriptive statistics, including distributions, means, standard deviations, skewness and kurtosis were obtained for all variables. Continuous measures were tested for normality and homogeneity of variance. Likert scale responses were analyzed as continuous scores given normal distribution.

Bivariate analyses examined the rate of SBIRT delivery in the two arms at the time of follow up, and comparison of TPB-based measures, e.g., beliefs about SBIRT, social norms and influence, and perceived behavioral control. Analyses included the percent of patients screened, the percent of brief interventions delivered and the percent of trainees who provided a referral to treatment across 10 weeks. Significance level was set at $p<.05$.

Pearson correlation coefficients were analyzed between TPB-based constructs, intention to deliver SBIRT, and screening rates. A regression analysis was conducted for predictors of intent to screen, including the variables of confidence, attitudes, subjective norms and perceived behavioral control.

Within the intervention group, mean app utilization data were analyzed in total minutes. App usability ratings using the system usability scale were examined descriptively in the intervention group. Analyses were conducted using SAS 9.3 and R version 3.4.4.[32,33]

Results

Of 297 invited trainees, 131 consented to participate. 63 were allocated to the intervention group and 68 to the control. Within the intervention group, 78% (49/63) downloaded the app and 47 participants downloaded the app and completed the pre-questionnaire. In the control group, 62 participants completed the pre-questionnaire and 61 participants completed both the pre and post questionnaire. Forty participants assigned to the intervention group and 61 control group participants completed the study (see Figure 2). The highest proportion of the participants overall were from nursing programs (40.8%) and 68.6% of the full sample had prior SBIRT training (see Table 2). No statistically significant differences were found between control and intervention group characteristics.

SBIRT usage questionnaire

Overall, the control group reported having significantly more patient contacts (M=45.99, SD= 35.18) than the intervention group (M=24.52, SD= 24.21), (p <.001). Among the patients who were seen, there were no statistically significant differences between groups in the percentage of patients screened (Intervention: M=31%, SD= 24%; Control: 31%, SD=29%; p= .98), brief interventions delivered (Intervention: M=14%, SD=17%; Control: M=11%, SD=15%; p=.38) or referrals made to treatment (Intervention: M=10%, SD=15%; Control: M=9%, SD=14%; p=.72).

TPB-Based Questionnaire

We also compared the study groups on TPB-based constructs at baseline and again at follow up. At both time points there were no differences between groups on attitudes/ behavioral beliefs, confidence in ability to deliver SBIRT, subjective norms, or perceived behavioral control. There was also no difference between groups in behavioral intent to deliver SBIRT (Table 3).

At the time of follow-up, significant correlations were found between intent to screen and attitudes/behavioral beliefs (r=.49, p=.01); confidence (r=.36, p=.01); subjective norms (r=.54, p=.01) and perceived behavioral control (r=.42, p=.01). Also, at the time of follow-up, significant correlations were found between percent screened and confidence (r=.24, p=.05); subjective norms (r=.22, p=.05) and perceived behavioral control (r=.28, p=.01). Using the follow-up data, a linear regression analysis was performed to predict intent to screen and percent screened based on the variables of confidence, attitudes, subjective norms and perceived behavioral control (not shown). A significant regression equation was found (F(5,95)=14.012, p<.001) with an R^2 of .424 for intent to screen using the predictors of confidence, attitudes, subjective norms and perceived behavioral control. The variables of attitude (p=.01) and subjective norms (p=.001) were statistically significant predictors of participants' intent to screen patients. The regression model including TPB measures as predictors of percent of patients screened yielded no significant results.

At the time of follow up, the mean system usability score (SUS) score was 62.00 (SD=12.01) which indicates a below average usability score (intervention group only).

Participants spent an average of 8.81 minutes (SD= 2.71) in the app (Range: 6.41–15.43 minutes).

Discussion

This study examined the effect of a theory-based mobile app (i.e., a digital behavior change intervention or DBCI) on the delivery of SBIRT by multi-disciplinary health care professional trainees. Non-significant results in SBIRT delivery between intervention and control group participants suggest that further consideration of app effectiveness and app engagement as a clinical translation tool is warranted. Although available data on the effectiveness of DBCIs are promising, challenges to engagement have previously been noted,[34–37] which also were evident in the current randomized trial.

DBCI engagement has been conceptualized in terms of user experience and behaviors as influenced by context, DBCI mechanism of action, and target behaviors.[38] Lin et al.[34] further deconstructed user engagement behavior as “acceptance”, “uptake” and “adherence”. In this SBIRT app study, consistent with the findings of Lin et al., the acceptance and uptake of the SBIRT app were sufficient. Acceptance was identified in the qualitative findings of the pilot study in this app project,[29] as well as by the app download rate in the RCT. In the qualitative pilot, trainees expressed comfort with using the SBIRT app in general to help guide clinical practice, reflected in the robust download rate for the app in this study. Thus uptake, based on the number of participants who downloaded and completed the initial log-in, in this study was good. However, after the initial log-in, the average amount of time spent using the app was low, 9 minutes, with a maximum use of 15 minutes, demonstrating poor adherence.

Recognizing the persistent issue of app adherence, Yardley et al.[37] identified the importance of “effective engagement”, defined as sufficient engagement to achieve intended outcomes. Effective engagement is evaluated by how use relates to desired outcomes rather than how often the digital tool is used. The authors present three potential focus areas to improve engagement with DBCIs: 1) Developing engaging digital behavior interventions; 2) Tailoring and fit; and 3) Combining digital and human support.[37] Developing engaging digital health interventions involves “user-centered” design in the app development. The user-centered approach in this study was accomplished by including trainee feedback from the preliminary app pilot study in the development of the final app project. One specific piece of feedback provided by trainees in the pilot was the recommendation to minimize screen navigation on the app. App items that they found particularly engaging were video resources, prompts for substance use screeners, and brief intervention scripts.[29] However, despite the study team’s efforts at user-centered design for the SBIRT app, the overall score for usability (62) fell short of the acceptable benchmark (68). This could have affected the outcomes on the app utilization and SBIRT delivery. Another issue of engagement that arose from the qualitative pilot data was the concern trainees had for the use of a personal mobile device in the context of the patient visit.[29] Based on this understanding, study outcomes may have been different if the SBIRT app was nested within a clinic laptop or tablet device. Yardley et al. discuss “tailoring and fit” of a DBCI related to health literacy, personal needs and motivations.[36] The app tested in this study was designed to be used

by multi-disciplinary health professions learners. It is possible that an app design tailored to specific health professions' workflow would have improved trainee adherence and study outcomes.

Lastly, this study combined digital and human support through classroom teaching prior to app access. The effect of the classroom training on the study outcomes is unknown. It is possible this training reduced the perceived necessity for the SBIRT app, resulting in no significant difference between the intervention and the control conditions in SBIRT delivery. An important observation from the pilot data was the critical influence of the preceptor in supporting the delivery of SBIRT in the clinical training environment.[29] Lack of support from the training environment could have affected rates of SBIRT delivery in both study conditions. The difference in TPB predictor outcomes, with attitudes and social norms as a significant predictor for intent to screen but not actual percent screened, may be explained in part by the influence of the clinical preceptor and training environment overall. These findings are consistent with a previous SBIRT clinical integration study conducted among baccalaureate nursing and master of social work students.[39] Future studies should consider the effect of the clinical preceptor and clinical training environment as human support for a clinical DBCI.

Significant correlations were found between TPB constructs and intent to screen and percent screened. These results support the potential value of the TPB model in explaining health care trainee behavior in the delivery of SBIRT. Results may also support use of the TPB model in the development of future DBCIs. Currently, the explicit use of behavioral theory in the development and implementation of DBCIs, including clinical training apps, is limited, posing challenges for the evaluation of outcomes.[24, 35] Available data on theory-based DBCIs draws primarily from individual health behavior change apps, not apps that support clinical practice. A systematic review of digital interventions for asthma self-management found that theory-based apps may improve adherence.[40] Examples of theoretical frameworks that have been used in DBCIs are: Self-regulation, Health Belief Model, Transtheoretical Model, Social Cognitive Theory, Social Marketing, Cognitive-Behavioral Model, Self-efficacy Theory, Systems Contingency approach, and the Theory of Planned Behavior.[24,40] Iterative application of theory to the future development and evaluation of clinical DBCIs may increase understanding of clinician behavior and further the development of clinical apps that promote effective engagement.[41] Theory-based DBCI development and evaluation may also provide a foundation for the creation of new or revised theoretical models to support the evolving ontology of digitally supported behavior change in clinical practice.[35]

Limitations

There was considerable variability in the clinical training environments of study participants, which is likely to have influenced participant behaviors during the trial. Study outcomes were not analyzed by profession or level of training due to sample size limitations, resulting in a lack of information on the influence of these factors. Patient encounter data were not collected, so the effect of patient health on SBIRT delivery is unknown. The reliability score

for the subjective norms construct within the TPB survey was low, potentially affecting analyses that included this measure.

Conclusions

This randomized controlled trial found no effect of an SBIRT mobile app on health care trainee behavior in their clinical placements, but was constrained by limited adherence to the mobile app within the intervention arm. The potential for utilization of digital tools to support the translation of best practices from classroom to clinic is promising however, additional research is needed to understand trainee adherence to DBCIs. More frequent use of rigorous analytic designs to examine digitally-supported trainee behavior change would address the call for raising the standard in health professional education overall.[42] The use of theory in the development of DBCIs may help explain clinician behavior and improve effective engagement. Future investigations should continue to examine theoretical models in the development, application and evaluation of DBCIs.

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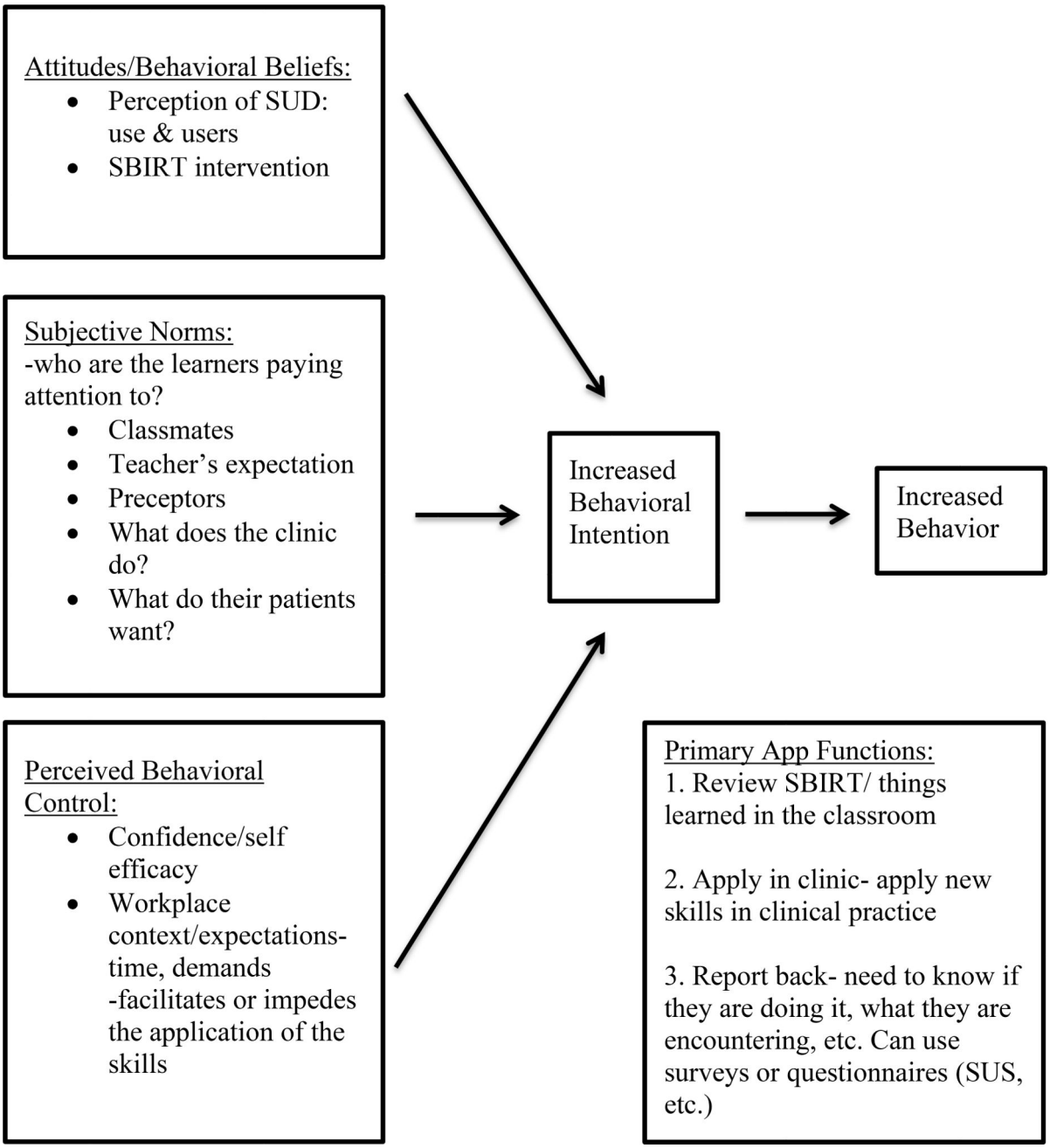

Figure 1:
Applying the Theory of Planned Behavior to the Delivery of Substance Use Interventions
Notes: Model was adapted from Ajzen (1991)[28]. SUD= substance use disorder. SUS = substance use screening.

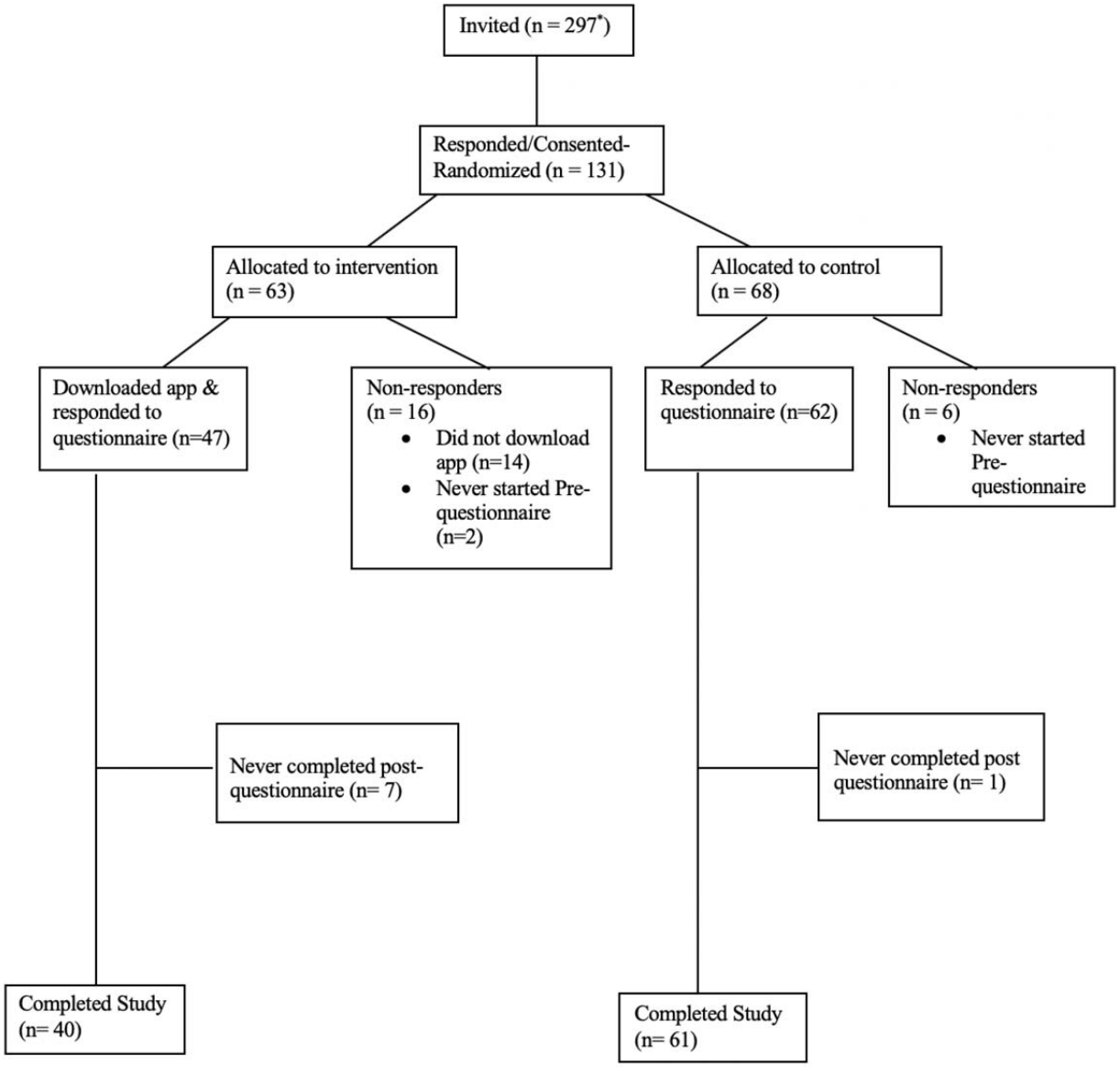

Figure 2:

SBIRT Mobile App Randomized Controlled Trial Consort Diagram

*Total number invited does not include total of number of UCSF School of Nursing (SON) learners invited. UCSF SON participants were recruited through the SON newsletter.

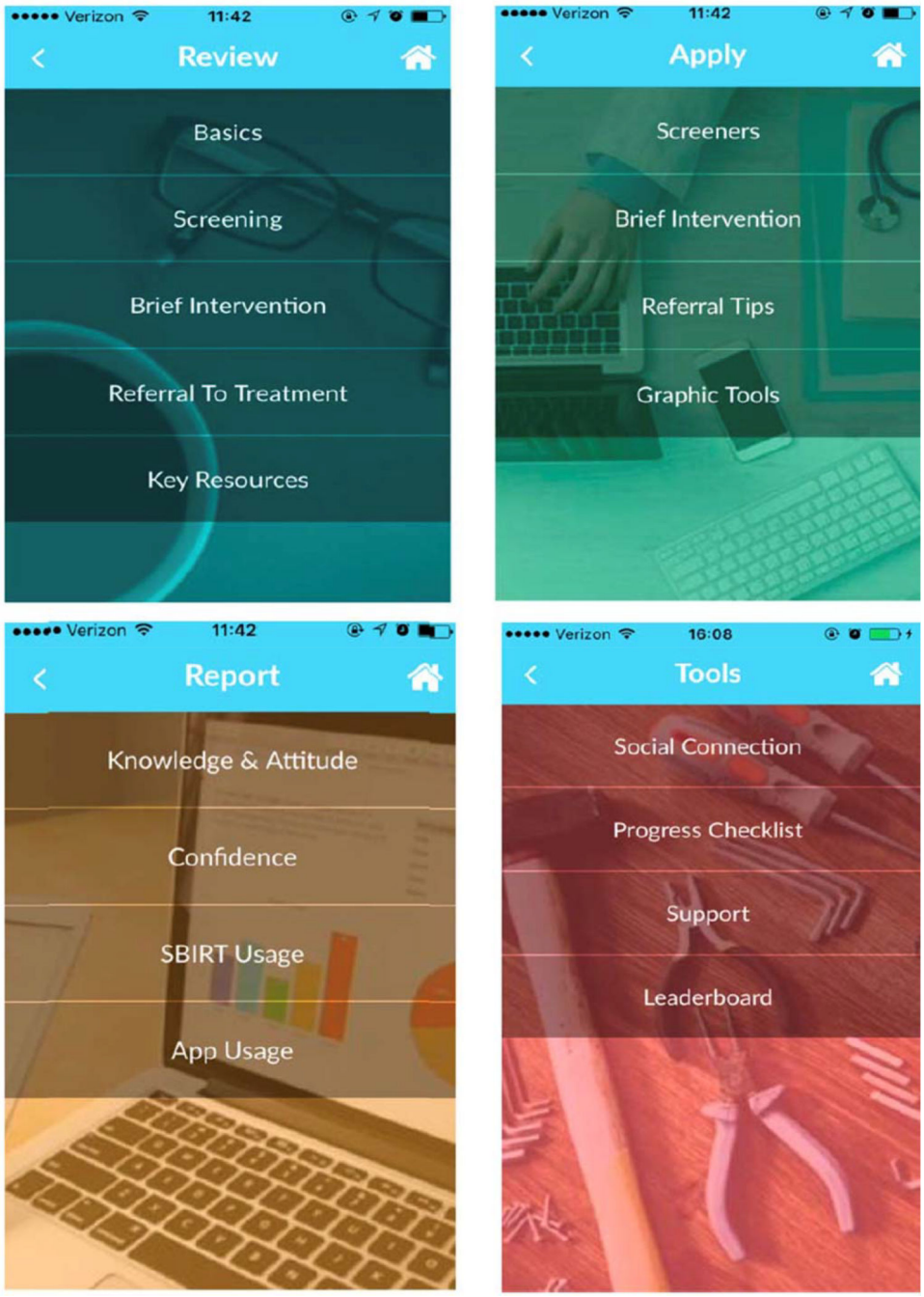

Figure 3.
SBIRT App Functions

Table 1.

Theory of Planned Behavior Questionnaire Items

TPB Construct	TPB Questionnaire Items
Attitudes/ Behavioral Beliefs	• Health and social services professionals should universally screen for all substance use. • Brief screening instruments can detect clinically meaningful drug, tobacco, or alcohol use. • A 3–5 minute brief intervention can effectively reduce alcohol use. • Brief advice from a health care and social service professional can increase a patient's/client's odds of quitting smoking. • Harm reduction strategies such as using clean needles are effective in improving health and reducing disease or injury. • Most substance users are willing to discuss their use with a health professional. • Screening and intervening around substance use should be done in primary care settings. • There are effective treatments for alcohol and drug use disorders. • Referral to specialty treatment should not be limited to patients who are ready to quit. • Referrals for substance use treatment can be efficient and effective. • Drug and alcohol misuse are frequently seen in most healthcare and social service settings. • Substance misuse is one of the leading behavioral causes of medical problems.
Subjective Norms	• Other clinical field placement students use SBIRT. • My classroom instructor expects me to use SBIRT. • My field supervisor supports the use of SBIRT. • My patients expect me to discuss substance use with them.
Confidence	• I am confident in my ability to screen patients/clients for alcohol/drug problems. • I am confident in my ability to perform a brief intervention. • I am confident in my ability to make treatment referrals for patients/clients with substance use disorders.
Perceived Behavioral Control	• I have adequate time to perform SBIRT in a clinic visit.
Behavioral Intent	• I intend to perform SBIRT whenever possible in my clinical/field placement

Notes: TPB = Theory of Planned Behavior. Items were rated on a scale of 1–5 with 1 = strongly disagree; 2= disagree; 3 = neutral; 4 = agree; 5 = strongly agree

Table 2.

Sample Characteristics at Baseline

Characteristics	Full sample (N=131)	Intervention (N=63)	Control (N=68)
	N (%)	N (%)	N (%)
Training program[1]			
Nursing	53 (40.8)	24 (38.1)	29 (43.3)
Social work	24 (18.5)	12 (19.0)	12 (17.9)
Internal medicine	22 (16.9)	11 (17.5)	11 (16.4)
Psychiatry	7 (5.4)	4 (6.3)	3 (4.5)
Psychology	24 (18.5)	12 (19.0)	12 (17.9)
Prior SBIRT training[2]			
Yes	72 (68.6)	32 (74.4)	40 (64.5)
No	33 (31.4)	11 (25.6)	22 (35.5)

Notes:

[1] Frequency Missing = 1

[2] Frequency Missing = 26

Table 3:

Theory of Planned Behavior mean subscale scores

TPB construct	Study Condition	Baseline			Follow-Up		
		N	Mean (SD)	P-value[1]	N	Mean (SD)	P-value[1]
Attitudes/Behavioral Beliefs				.26			.81
	Intervention	46	3.87 (0.39)		40	4.09 (0.40)	
	Control	62	3.96 (0.49)		61	4.07 (0.45)	
Subjective Norms				.91			.94
	Intervention	46	3.22 (0.53)		40	3.24 (0.55)	
	Control	62	3.23 (0.59)		61	3.25 (0.74)	
Confidence				.18			.37
	Intervention	46	6.33 (1.71)		40	6.73 (1.46)	
	Control	62	5.84 (2.02)		61	6.41 (2.06)	
Perceived Behavioral Control				.33			.48
	Intervention	46	3.25 (0.52)		40	3.06 (0.76)	
	Control	62	3.11 (0.93)		61	3.19 (1.02)	
Behavioral Intent				.30			.18
	Intervention	46	3.74 (0.77)		40	3.73 (0.64)	
	Control	62	3.58 (0.80)		61	3.92 (0.78)	

Notes: TPB - Theory of Planned Behavior.

[1]P-values obtained from t-test comparing means by study condition (intervention vs. control group).