Adolescent SBIRT: Healthcare Utilization and Comorbid Problems over 3 Years

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International Network on Brief Interventions for Alcohol and Other Drugs – 2018

28 September, 2018

Santiago, Chile

NIAAA R01AA016204

ClinicalTrials.gov #NCT02408952

Setting

KP Northern California

- 4 million members, 46% of commercial market share in region
- 500,000+ adolescent (11-18) members
- Diverse membership: race/ethnicity, cultural/linguistic, geographic, SES
- 21 hospitals, 233 medical office buildings
- 67,975 employees, 7,447 active physicians, 700 pediatricians
- Mature EHR
- Integrated system (medical, psychiatry, alcohol and drug treatment services)
- Capitated payment system
- Embedded research

Teen SBIRT in Pediatric Primary Care

Limited but growing literature:

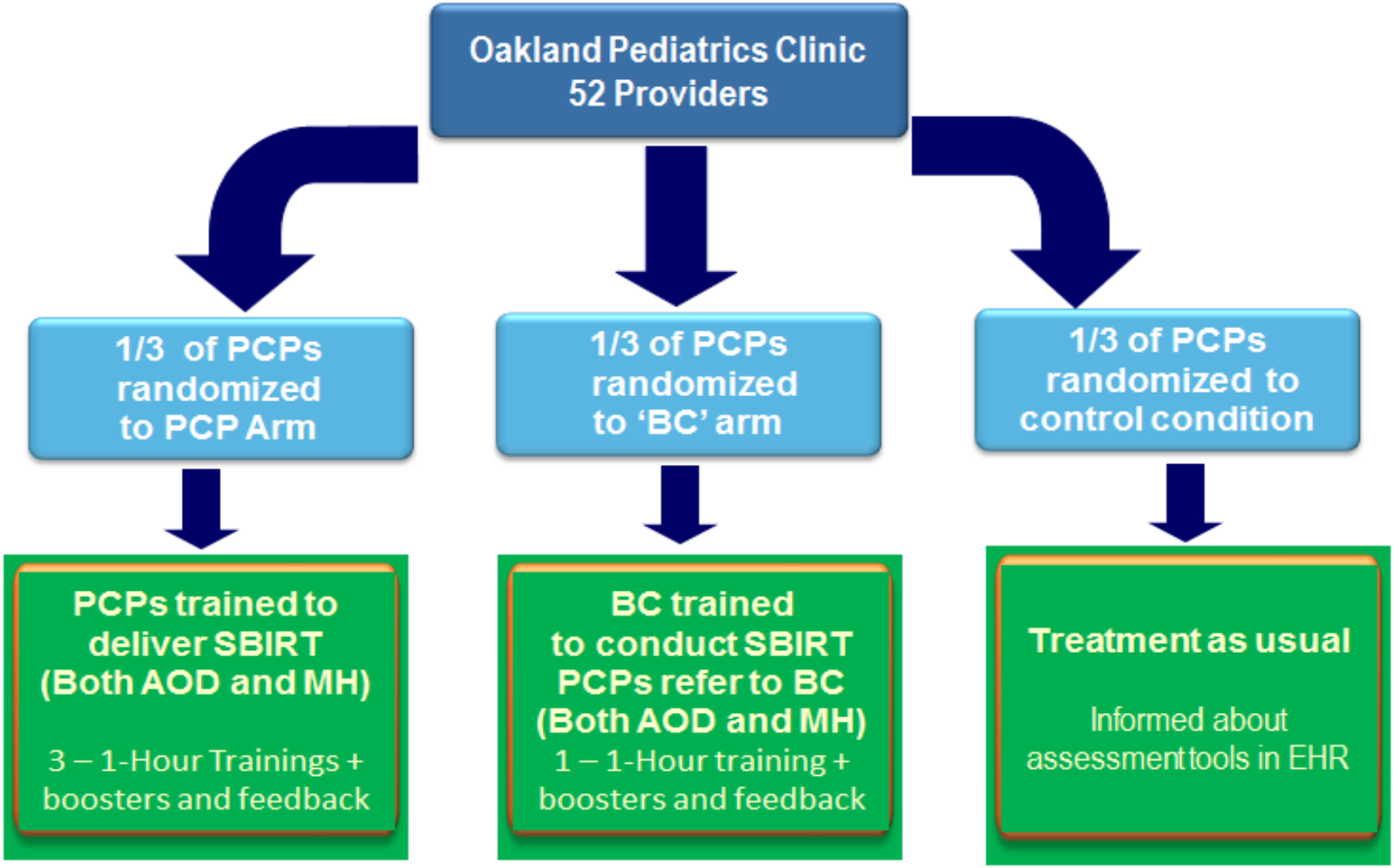
- Teens and parents are open to screening and intervention by PCPs (Yoast), less stigma than in specialty care (Wisdom)
- Less substance use among users and reduced initiation among non-users in the BI group (De Micheli, 2004);
- Less initiation of, lower rates of and less frequent cannabis use, lower rates of alcohol and other drug use and delinquency (D'Amico, 2008; Walton, 2013, 2014)
- Reductions in alcohol and cannabis initiation and use, increases in cessation (Harris, 2012)
- Fewer depression symptoms (Sterling, 2018)
- Improved specialty treatment initiation (Sterling, 2017; Tait, 2004, 2005)
- Multiple systematic reviews and Meta-analyses supporting the effectiveness of brief interventions for adolescents, across a variety of outcomes (Tanner-Smith & Lipsey, 2014; Tanner-Smith et al., 2015; Steinka-Fry et al., 2015; Tanner-Smith & Risser, 2016; Carney & Myers, 2012; Das et al., 2016.

Studies have not examined the effects of SBIRT on long-term healthcare utilization, or on long-term comorbidities.

Adolescent SBIRT Trial in Pediatric Primary Care (R01AA016204)

Pragmatic, cluster-randomized, hybrid effectiveness and implementation trial

Population base of adolescents – EHR data, 9,032 Total Adolescent Well-Visits



Adolescent SBIRT Trial in Pediatric Primary Care (NIAAA)

Which SBIRT model produces:

- better **implementation outcomes** - screening, assessment, brief intervention and referral rates?

Sterling S, Kline-Simon AH, Satre DD, et al. Implementation of Screening, Brief Intervention, and Referral to Treatment for Adolescents in Pediatric Primary Care: A Cluster Randomized Trial. *JAMA Pediatrics.* Nov 2 2015;169(11):e153145.

- better **patient outcomes** (substance use and mental health symptoms, related-school, legal & family problems), by gender, age and ethnicity?

Sterling, S., et al. (2018). "Pediatrician and Behavioral Clinician-Delivered Screening, Brief Intervention and Referral to Treatment: Substance Use and Depression Outcomes." J Adolesc Health.

- better specialty behavioral treatment **initiation and engagement rates**?

Sterling, S., et al. (2017). "Specialty addiction and psychiatry treatment initiation and engagement: Results from an SBIRT randomized trial in pediatrics." J Subst Abuse Treat **82**: 48-54.

- What are the **barriers** to, or **facilitators** of**,** SBIRT implementation?
- Which model of care is most **cost-effective**?

Screening

PERMANENTE

TEEN WELL CHECK

created by Ralph Rigaud

Name

DOB

Parent Questionnaire | Teen Questionnaire | Private Teen Questions | Hist

20. During the past year did you drink any alcohol? YES NO

21a. During the past year did you use marijuana? YES NO

21b. During the past year have you used any other drug to get high (such as prescription drugs, meth, ecstasy, glue or cocaine)? YES NO

22. During the past few weeks, have you OFTEN felt sad, down or hopeless? YES NO

23. Have you seriously thought about killing yourself, made a plan, or tried to kill yourself? YES NO

24a. Have you ever had sex (including oral, vaginal, or anal sex)? YES NO

24b. If yes, do you or your partner always use a condom when you have sex? NO YES

25. Are you attracted to guys, girls, or both? Guys Girls Both

Current Questionnaires

CRAFFT QUESTIONNAIRE

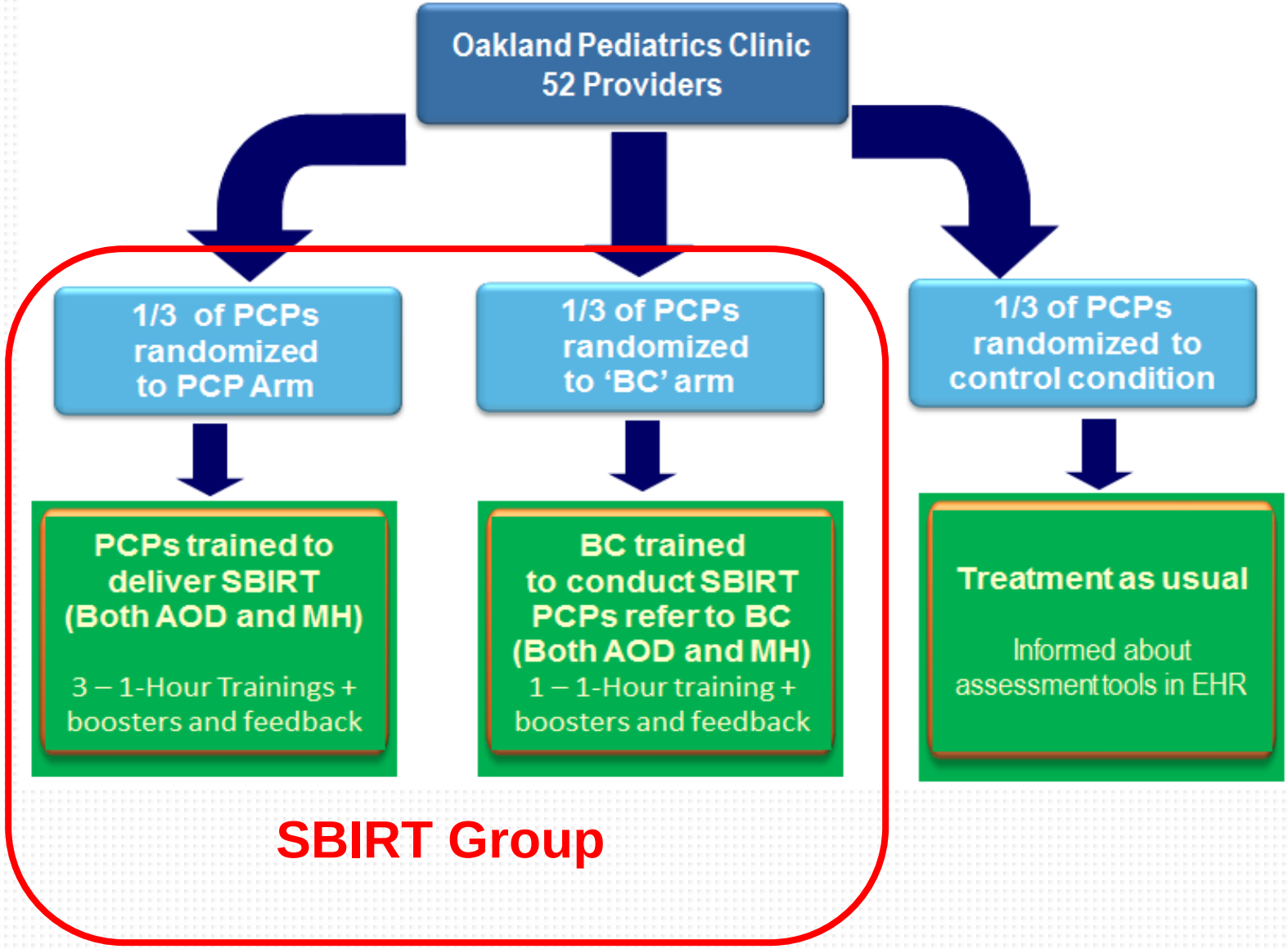
Add

Remove

Full CRAFFT Questionnaire (+AOD questions) in EHR "CRAFFT+"

Further Assessment

Adv	Question	Answer	Comment
	In the past 30 days, how many days have you used any of those substances?		← number entry for answer
	Have you ever ridden in a CAR driven by someone (including yourself) who was "high" or had been using alcohol or drugs?		
	Do you ever use alcohol or drugs to RELAX, feel better about yourself, or fit in?		
	Do you ever use alcohol or drugs while you are by yourself, ALONE?		
	Do you ever FORGET things you did while using alcohol or drugs?		
	Do your family or FRIENDS ever tell you that you should cut down on your drinking or drug use?		
	Have you gotten into TROUBLE while you were using alcohol or drugs?		
	If two or more YES answers to the CRAFFT questions above, please complete remaining questions		


Oakland Pediatrics Clinic
52 Providers
1/3 of PCPs randomized to PCP Arm
1/3 of PCPs randomized to 'BC' arm
1/3 of PCPs randomized to control condition
PCPs trained to deliver SBIRT (Both AOD and MH)
3 – 1-Hour Trainings + boosters and feedback
BC trained to conduct SBIRT PCPs refer to BC (Both AOD and MH)
1 – 1-Hour training + boosters and feedback
Treatment as usual
Informed about assessment tools in EHR
SBIRT Group

Research Questions

- What are the rates of healthcare services utilization (overall, Emergency Department, primary care, and specialty substance use and psychiatry) in the SBIRT group, compared to those in the Usual Care group – at 1 and 3-years post-index screening visit)?
  - Compare 1-year and 3-year prevalence of substance use and mental health diagnoses, including ADHD, anxiety, bipolar disorder, depression and substance use disorders.
  - Compare the prevalence of pediatric medical conditions such as asthma, arthritis, diabetes, irritable bowel syndrome, migraine, rhinitis and sinusitis.

Methods

Measures

Patient characteristics*. G*ender, age, race/ethnicity, and length of enrollment in the 3 years post index date.

Health services utilization**.** Outpatient and inpatient services use for up to 3 years post-index from EHR.

Visit counts: ED, primary care, substance use treatment and psychiatric services and all outpatient visits, were created for both time periods.

Comorbidity*. EHR Diagnoses* over 1 and 3 years post-index – behavioral health conditions and any of the seven most common or chronic medical conditions found in this age group

Statistical Analysis

Chi-squared and t-tests to examine differences in demographic characteristics and medical and behavioral health comorbidities

Multivariate logistic regression models were used to examine dichotomous outcomes – psychiatric, medical or substance use diagnoses)

Negative binomial regression models were used to examine healthcare visit counts

The exponent of the coefficient for the treatment variable represents the odds ratio (OR)for the logistic regressions, and the incidence rate ratio (iRR) for the negative binomial regressions, for the SBIRT group relative to the Usual Care group.

Results

- 1871 patients screened positive on at least one of the mood or substance use symptom questions or were deemed eligible for SBIRT based on pediatrician assessment
- The index date = the date on which the adolescent was screened for substance use and/or mental health symptoms.
- The SBIRT group had significantly more women (59.5% vs. 48.1%; $p < .05$) and non-white adolescents (78.9% vs. 68.3%; $p < .05$) than the UC group; no age differences.
- Over 93% of the study sample had continuous membership for the 1-year post-index period and over 80% were continuous members up to 3 years, post-index.
- At 1-year, the UC group had more continuous members than the brief intervention group (95.6% vs. 92.3%, $p < .05$); there were no differences in the lengths of membership between groups at 3 years.
- *Pre-Index Utilization. No* differences in services use and comorbidities between the SBIRT and usual care groups in the year prior to index date.

Healthcare Utilization – 1 Year Post-Index

	Emergency Department Visits			Primary Care Visits			Psychiatry Visits			All Outpatient Visits		
	iRR	95% Confidence Interval		iRR	95% Confidence Interval		iRR	95% Confidence Interval		iRR	95% Confidence Interval	
SBIRT Group (Ref=UC)	0.82	0.66	1.01	0.97	0.81	1.17	0.72	0.54	0.96	0.86	0.69	1.07
Gender (Ref=male)	1.52	1.23	1.87	1.42	1.19	1.69	2.18	1.69	2.82	1.50	1.23	1.83
Age	0.96	0.90	1.03	1.01	0.95	1.08	0.69	0.62	0.76	0.86	0.80	0.92
Race (Ref=White)												
Asians	0.61	0.40	0.92	1.11	0.82	1.51	0.77	0.49	1.21	1.16	0.82	1.65
Black	1.66	1.29	2.13	0.92	0.73	1.16	1.36	0.97	1.89	1.01	0.78	1.32
Hispanic	0.84	0.62	1.14	0.93	0.73	1.19	0.87	0.59	1.29	1.08	0.81	1.44
Missing/Unknown	0.30	0.15	0.60	1.18	0.81	1.73	2.24	1.28	3.92	1.38	0.89	2.13

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Healthcare Utilization – 1 Year Post-Index

	Emergency Department Visits			Primary Care Visits			Psychiatry Visits			All Outpatient Visits		
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Age	0.96	0.90	1.03	1.01	0.95	1.08	0.69	0.62	0.76	0.86	0.80	0.92
Race (Ref=White)												
Asians	0.61	0.40	0.92	1.11	0.82	1.51	0.77	0.49	1.21	1.16	0.82	1.65
Black	1.66	1.29	2.13	0.92	0.73	1.16	1.36	0.97	1.89	1.01	0.78	1.32
Hispanic	0.84	0.62	1.14	0.93	0.73	1.19	0.87	0.59	1.29	1.08	0.81	1.44
Missing/Unknown	0.30	0.15	0.60	1.18	0.81	1.73	2.24	1.28	3.92	1.38	0.89	2.13

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Healthcare Utilization – 3 Years Post-Index

	Emergency Department Visits			Primary Care Visits			Substance Use Treatment Visits			Psychiatry Visits			All Outpatient Visits		
	iRR	95% Confidence Interval		iRR	95% Confidence Interval		iRR	95% Confidence Interval		iRR	95% Confidence Interval		iRR	95% Confidence Interval	
SBIRT Group (Ref=UC)	0.96	0.81	1.14	1.00	0.91	1.10	2.18	1.37	3.49	0.71	0.55	0.91	0.83	0.72	0.95
Gender (Ref=male)	1.35	1.15	1.59	1.58	1.44	1.73	0.70	0.50	0.97	1.12	0.88	1.43	1.17	1.03	1.33
Age	0.97	0.92	1.02	0.91	0.89	0.94	1.10	0.94	1.29	0.64	0.59	0.70	0.74	0.70	0.77
Race (Ref=White)															
Asians	0.63	0.45	0.88	0.85	0.72	1.00	0.09	0.05	0.20	0.53	0.35	0.82	0.71	0.57	0.90
Black	2.18	1.76	2.70	1.02	0.91	1.15	0.07	0.04	0.12	0.80	0.59	1.09	0.83	0.70	0.98
Hispanic	1.89	1.50	2.38	0.93	0.82	1.06	0.60	0.34	1.06	0.63	0.45	0.88	1.00	0.83	1.20
Missing/Unknown	1.14	0.78	1.67	1.04	0.85	1.28	0.16	0.07	0.39	0.95	0.57	1.61	0.83	0.62	1.11

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Healthcare Utilization – 3 Years Post-Index

	Emergency Department Visits			Primary Care Visits			Substance Use Treatment Visits			Psychiatry Visits			All Outpatient Visits		
	iRR	95% Confidence Interval		iRR	95% Confidence Interval		iRR	95% Confidence Interval		iRR	95% Confidence Interval		iRR	95% Confidence Interval	
SBIRT Group (Ref=UC)	0.96	0.81	1.14	1.00	0.91	1.10	2.18	1.37	3.49	0.71	0.55	0.91	0.83	0.72	0.95
Gender (Ref=male)	1.35	1.15	1.59	1.58	1.44	1.73	0.70	0.50	0.97	1.12	0.88	1.43	1.17	1.03	1.33
Age	0.97	0.92	1.02	0.91	0.89	0.94	1.10	0.94	1.29	0.64	0.59	0.70	0.74	0.70	0.77
Race (Ref=White)															
Asians	0.63	0.45	0.88	0.85	0.72	1.00	0.09	0.05	0.20	0.53	0.35	0.82	0.71	0.57	0.90
Black	2.18	1.76	2.70	1.02	0.91	1.15	0.07	0.04	0.12	0.80	0.59	1.09	0.83	0.70	0.98
Hispanic	1.89	1.50	2.38	0.93	0.82	1.06	0.60	0.34	1.06	0.63	0.45	0.88	1.00	0.83	1.20
Missing/Unknown	1.14	0.78	1.67	1.04	0.85	1.28	0.16	0.07	0.39	0.95	0.57	1.61	0.83	0.62	1.11

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Mental Health, Substance Use and Medical Comorbidities, SBIRT vs. Usual Care, 1-Year Post-Index

	Any Mental Health Dx			Any Substance Use Dx ǂ			Any Chronic Medical Conditions Dx		
	Odds Ratio	95% Confidence Interval					Odds Ratio	95% Confidence Interval	
SBIRT Group (Ref=Usual Care)	0.68	0.48	0.98				0.64	0.44	0.95
Gender (Ref=male)	1.40	0.98	2.00				1.14	0.77	1.68
Age	0.87	0.77	0.97				1.03	0.90	1.17
Race (Ref=White)									
Asians	0.88	0.48	1.62				0.69	0.31	1.55
Black	0.93	0.60	1.44				1.64	1.00	2.68
Hispanic	0.63	0.38	1.07				0.94	0.52	1.69
Missing/Unknown	1.14	0.56	2.31				1.36	0.60	3.09

Note: ǂ = too few observations (< 1%) with this condition to run multivariate analyses

Mental Health, Substance Use and Medical Comorbidities, SBIRT vs. Usual Care, 1-Year Post-Index

	Any Mental Health Dx			Any Substance Use Dx ǂ			Any Chronic Medical Conditions Dx		
	Odds Ratio	95% Confidence Interval					Odds Ratio	95% Confidence Interval	
SBIRT Group (Ref=Usual Care)	0.68	0.48	0.98				0.64	0.44	0.95
Gender (Ref=male)	1.40	0.98	2.00				1.14	0.77	1.68
Age	0.87	0.77	0.97				1.03	0.90	1.17
Race (Ref=White)									
Asians	0.88	0.48	1.62				0.69	0.31	1.55
Black	0.93	0.60	1.44				1.64	1.00	2.68
Hispanic	0.63	0.38	1.07				0.94	0.52	1.69
Missing/Unknown	1.14	0.56	2.31				1.36	0.60	3.09

Note: ǂ = too few observations (< 1%) with this condition to run multivariate analyses

Mental Health, Substance Use and Medical Comorbidities, SBIRT vs. Usual Care, 3-Year Post-Index

	Any Mental Health Dx			Any Substance Use Dx			Any Chronic Medical Conditions Dx		
	Odds Ratio	95% C.I.		Odds Ratio	95% C.I.		Odds Ratio	95% C.I.	
SBIRT Group (Ref=UC)	0.82	0.66	1.02	0.61	0.43	0.86	0.92	0.74	1.13
Gender (Ref=male)	1.35	1.09	1.66	0.66	0.47	0.93	1.14	0.94	1.40
Age	0.83	0.77	0.88	1.17	1.04	1.32	0.90	0.84	0.96
Race (Ref=White)									
Asians	0.55	0.38	0.80	0.55	0.26	1.16	0.61	0.42	0.89
Black	0.67	0.51	0.87	1.19	0.77	1.85	1.18	0.91	1.52
Hispanic	0.73	0.55	0.97	1.30	0.81	2.07	0.87	0.66	1.16
Missing/Unknown	0.53	0.33	0.87	0.95	0.43	2.10	0.94	0.60	1.46

Mental Health, Substance Use and Medical Comorbidities, SBIRT vs. Usual Care, 3-Year Post-Index

	Any Mental Health Dx			Any Substance Use Dx			Any Chronic Medical Conditions Dx		
	Odds Ratio	95% C.I.		Odds Ratio	95% C.I.		Odds Ratio	95% C.I.	
SBIRT Group (Ref=UC)	0.82	0.66	1.02	0.61	0.43	0.86	0.92	0.74	1.13
Gender (Ref=male)	1.35	1.09	1.66	0.66	0.47	0.93	1.14	0.94	1.40
Age	0.83	0.77	0.88	1.17	1.04	1.32	0.90	0.84	0.96
Race (Ref=White)									
Asians	0.55	0.38	0.80	0.55	0.26	1.16	0.61	0.42	0.89
Black	0.67	0.51	0.87	1.19	0.77	1.85	1.18	0.91	1.52
Hispanic	0.73	0.55	0.97	1.30	0.81	2.07	0.87	0.66	1.16
Missing/Unknown	0.53	0.33	0.87	0.95	0.43	2.10	0.94	0.60	1.46

Summary

- The SBIRT group had fewer psychiatry visits at 1 and 3 years.
  - No differences in year prior to index visit
- The SBIRT group had fewer total outpatient visits at 3 years.
- Emergency Department visits differed marginally, with the SBIRT group having fewer – at 1 year.
- The SBIRT group was less likely to have mental health diagnoses or chronic medical conditions at 1 year compared to those in Usual Care.
- At 3 years the SBIRT group was less likely to have substance use diagnoses, and more likely to have substance use treatment visits.

- This study is among the first to examine the association between access to SBIRT and healthcare services utilization.
- Brief interventions for substance use may have a significant and enduring impact on both health and healthcare utilization during this critical developmental period.
- That we found a trend toward lower ED utilization even in this relatively low-severity population underscores the potential of brief interventions in the primary care setting to reduce ED use among adolescents and young adults.
- Future research is needed to further explore the effects of SBIRT for adolescents on these important outcomes.

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