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Improving Screening for Adolescent Substance Use and Mental Health in Primary Care

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Abstract

Background: Mental health and substance use can co-exist and worsen outcomes for youth. The goals of the Transformative and Evidence-based Approaches to Mental health and Substance use Screening (TEAMSS) quality improvement virtual learning collaborative were to enhance the implementation of screening and follow-up practices for adolescent substance use and mental health issues in primary care.

Methods: TEAMSS engaged 160 clinicians at 27 pediatric primary care clinics in 18 states. Interventions focused on enhancing clinical processes related to screening, brief intervention and follow-up for substance use, depression, anxiety, and suicide risk. The learning collaborative model was adapted for a virtual environment with learning sessions and action periods of shorter duration interspersed with individualized coaching.

Results: Clinics standardized processes for screening and intervention, incorporated use of validated screening tools, increased the use of electronic health records and mobile devices in screening, engaged interprofessional team members, identified community resources, and increased clinician and staff knowledge of evidence-based guidelines and quality improvement methods. Substance use screening significantly increased from 35% to 75%. Follow-up of adolescents with positive substance use screening increased from 69% to 86%. Depression screening increased from 82% to 90%, anxiety screening increased from 32% to 69%, and suicide risk screening increased from 18% to 41%.

Conclusions: TEAMSS significantly improved care for substance use, depression, anxiety, and suicide risk for adolescents at participating primary care clinics. Adapting a learning collaborative approach to a virtual setting requires close attention to maintaining engagement with clinical care teams, especially those in busy primary care clinics.

Mental health and substance use can co-exist and worsen outcomes for youth. The Transformative and Evidence-based Approaches to Mental health and Substance use Screening (TEAMSS) quality improvement virtual learning collaborative significantly improved care for substance use, depression, anxiety, and suicide risk for adolescents at 27 participating primary care clinics. TEAMSS identified strategies for adapting a learning collaborative approach to a virtual setting and maintaining engagement with clinical teams in busy primary care clinics.

Introduction

Adolescent substance use is a significant health concern in the United States. Approximately 42% of 12th graders reported using alcohol, 26% reported cannabis use, and 21% used nicotine in the past year [1]. Adolescents are concomitantly experiencing a mental health crisis with suicide as the second leading cause of death for youth in the United States [2]. Since mental health issues and substance use can coexist and worsen outcomes for youth, an evidence-based clinical approach is required to address both issues [3-7].

Risk screening during health maintenance visits provides an opportunity to detect adolescent substance use and mental health issues, such as depression, anxiety, and suicidality. By addressing these concerns, clinicians can provide early intervention, along with support for adolescents and their families through treatment and recovery. Despite evidence-based recommendations, standardized screening for substance use and mental health for adolescents occurs during less than half of primary care visits due to variations in clinician knowledge and confidence in managing these concerns, time constraints, and limited access to treatment [8,9,16].

The goal of the Transformative and Evidence-based Approaches to Mental health and Substance use Screening (TEAMSS) quality improvement (QI) learning collaborative was to increase by 25% the proportion of patients screened and followed-up for substance use and mental health issues among adolescents aged 12-18 years seen for health maintenance visits at participating primary care clinics.

Methods

Context

The TEAMSS QI collaborative recruited primary care clinics across the United States in early 2024 through calls for participation on professional listservs. A total of 30 clinics applied to participate and 27 clinics enrolled. A project team with expertise in QI, adolescent health, substance use, mental health, and implementation science developed project aims, selected quality measures, evaluated key drivers, and designed interventions (Figure 1). Participating staff at primary care clinics included physicians, registered nurses, nurse practitioners, medical assistants, clinic managers, social workers, health educators, and clinical psychologists.

Interventions

Interventions focused on enhancing clinical processes for screening, brief intervention, and follow-up of substance use, depression, anxiety, and suicidality. Addressing substance use was the primary focus of TEAMSS, and clinics could elect to address additional mental health issues based on their patient populations and priorities. The Institute for Healthcare Improvement's Breakthrough Series collaborative model was adapted for a virtual environment (Figure 2) with four learning sessions and action periods interspersed with small-group coaching calls for additional support [10]. Clinics attended virtual case-based learning sessions on evidence-based approaches for screening and follow-up of substance use, depression, anxiety, and suicidality. Gaps in knowledge identified through participant surveys were addressed through additional brief webinars on clinical workflow, billing and coding, community collaboration, and

prescription of psychopharmaceuticals. Participating clinicians were trained in evidence-based techniques for brief interventions through virtual interactive sessions [11].

Clinics tested and implemented interventions to improve substance use and mental health screening and management using Plan-Do-Study-Act (PDSA) cycles adapted to their settings. They received ongoing feedback on group and clinic-level data and engaged in individualized coaching and peer learning with other teams. While clinics focused on the primary goal of improving substance use screening and management by 25% over baseline, they also collected and submitted data on depression, anxiety, and suicide risk and were provided education and coaching to address these areas. Monthly performance data and newsletters containing clinical and QI resources, practice shoutouts, and data highlights were shared with clinics.

Study of the interventions

Health maintenance visits with no additional medical diagnoses and health maintenance visits for follow-up of medical concerns were included. Patients with pre-existing diagnoses or risk factors for substance use and mental health issues were not excluded. Through monthly chart reviews, clinics submitted one month of baseline data (Cycle 1) followed by ten months of intervention data (Cycles 2-11) through an online data repository. Designated clinic staff reviewed their medical records for eligibility each month, beginning with visits conducted on a random start date assigned by project leadership. Data were submitted for the first 30 eligible patients chronologically from this start date or until all eligible records were reviewed. Larger practices were encouraged to submit monthly data for at least 10 patients per physician to account for higher patient volumes.

Each clinic completed an enrollment survey, a post-intervention survey, and a 9-month follow-up survey evaluating their practices for screening and follow-up of substance use and mental health issues. Individual clinicians completed a survey to assess changes in knowledge of and confidence in screening and management of substance use and mental health, QI methods, self-reported changes in practices, and feedback on impact and satisfaction with TEAMSS.

Measures

Screening was defined as the completion of a standardized screening questionnaire. Measures collected and tracked monthly included the percentage of health maintenance visits for adolescents 12-18 years of age with documented screening for substance use; positive screen for substance use and brief intervention and/or referral to treatment and a follow-up plan; screening for depression; positive screen for depression and brief intervention and/or referral to treatment and plan for follow-up; screening for anxiety; positive screen for anxiety and brief intervention and/or referral to treatment and plan for follow-up; documented screening for suicide risk; and positive screen for suicide risk with brief intervention and/or referral to treatment and plan for follow-up.

Analysis

Robust generalized estimating equations (GEE) with a Poisson distribution and log link were used to estimate incidence rate ratios (IRRs) comparing each intervention month with baseline. A negative binomial GEE was used for the suicide risk screening outcome to account for excess

zeros. Analyses were conducted at the clinic level to address within-subject correlation from repeated measures. For screening outcomes, the number of patients screened was modeled with an offset equal to the log of patients seen for health maintenance visits. For follow-up outcomes, the number of patients receiving follow-up was modeled with an offset equal to the log of patients with positive screens. Analyses were performed using SPSS version 29 (IBM Corp.), with two-sided p-values <0.05 considered statistically significant.

Supplemental statistical process control (SPC) charts were used to assess temporal changes (SPC for Excel, BPI Consulting, LLC). Measures were displayed as p-charts with variable control limits based on sample size. Standard SPC rules were applied to differentiate common-cause from special-cause variation.

Ethical Considerations

The project was reviewed and approved by the American Academy of Pediatrics Institutional Review Board.

Results

Practice demographics

The TEAMSS QI collaborative included 160 clinicians at 27 pediatric primary care clinics in 18 states in the United States and was implemented from March 2024 through February 2025. Clinics served a median of 1,500 patients aged 12-18 years annually for health maintenance visits (range 100-7000 visits, SD 1,491) and clinic demographics are described in Table 1. Clinics had a range of prior experience with QI and 52% of clinics reported previous participation in a QI initiative. Changes in rates of screening and follow-up for substance use, depression, anxiety, and suicide risk and rates of follow-up for positive screening at health maintenance visits are presented in Figure 3 and Figure 4. Control charts are included as supplemental data in Figures 5-12. Tables 2 and 3 summarize results from Generalized Estimating Equation (GEE) analyses.

Substance use screening and follow-up

Substance use screening was conducted at 35.3% of health maintenance visits at baseline. Screening rates increased in cycle 2 (IRR 1.38, $p = .02$) and continued to rise, reaching 74.8% at the end of the intervention period (IRR 2.03, $p < .001$). The percentage of patients who screened positive for substance use who received follow-up care increased from 69.2% at baseline to 86% by the end. Compared to baseline, follow-up rates were significantly higher in cycles 8-10 (IRRs ≥ 1.37 -1.40, $p = .02$). Although the follow-up rate in cycle 11 was higher compared to baseline, the difference was not statistically significant (IRR 1.26, $p = 0.14$).

Depression screening and follow-up

Depression screening increased from 82.4% to 89.8%. Compared to baseline, screening rates were significantly higher in cycles 4-6 (IRRs ≥ 1.07 , $p < .05$) and cycles 9-11 (IRRs ≥ 1.11 , $p < .008$). The percentage of patients with a positive screen for depression who received follow-up was 73.9% at baseline and significantly increased in cycles 9-10 (IRRs ≥ 1.3 , $p < .02$). The

follow-up rate for depression in cycle 11 was 74.3%, not significantly different from that at baseline (IRR = 1.04, $p = 0.48$).

Anxiety screening and follow-up

Anxiety screening increased from 31.6% to 69.2%. Compared to baseline, screening rates were significantly higher in cycle 3 (IRR 1.53, $p = .02$) and continued to increase through cycle 11 (IRR 2.10, $p < .001$). The percentage of adolescents with positive anxiety screens who received follow-up was 82.2% at baseline, and follow-up rate after the intervention was 81.3%.

Suicide risk screening and follow-up

Screening for suicide risk increased from 17.8% to 41.2%. Suicide risk screening rates were significantly higher in cycles 9-11 (IRRs ≥ 1.86 , $p < .05$). For adolescents with a positive screening for suicide risk, 87% received follow-up at baseline, and this follow-up rate after the intervention was 88.9%.

Changes in clinical workflow and practice

Clinics completed a post-project survey to assess changes to clinic practices as a result of their participation in TEAMSS. Of the 22 clinics that responded to the survey, 21 (95.5%) implemented interventions to improve substance use screening, 13 (59.1%) changed their approach to depression screening, 15 (68.2%) changed their approach to screening for anxiety, and 13 (59.1%) clinics reported changing to their approach to suicide screening (Table 4).

Clinics that modified their substance use screening tool ($n=8$), reported that they implemented the Car, Relax, Alone, Forget, Friends, Trouble (CRAFFT) questionnaire or shifted from using the CRAFFT to the CRAFFT + N questionnaire to additionally screen for nicotine [12]. Use of validated screening questionnaire for depression was high at baseline, and clinics utilized Patient Health Questionnaire-9 (PHQ-9) or PHQ-9 modified for Adolescents (PHQ-A). Clinics reported making their screening workflow for depression more efficient following participation in TEAMSS. Clinics that modified screening practices for anxiety the General Anxiety Disorder-7 (GAD-7) questionnaire to their workflow. Clinics that modified their practices for suicide risk screening introduced Ask Suicide-Screening Questions (ASQ) into their workflow. Clinics that were successful in integrating screening into their Electronic Health Record (EHR) or mobile devices at the point-of-care shared their experience during learning sessions and coaching calls with clinics that were planning to incorporate this approach.

Identification of community partnerships

Participants reported greater awareness of relevant community resources and collaborators due to their participation in TEAMSS. With respect to identifying potential community partnerships, 21 clinics (95%) identified two and 19 clinics (86%) identified three individuals or organizations they could collaborate with. Examples of community partners identified by clinics included local mental health professionals, treatment centers, social support agencies, publicly funded programs, and school-based services.

Effectiveness of the learning collaborative approach

The Assessment Scale for Collaboratives was used to evaluate progress of clinics in implementing interventions [13]. On a scale of 1-to-5, with 1 indicating that clinics formed an improvement team and 5 indicating outstanding sustainable results, 21 of the 22 clinics (95% of respondents) reported a score greater than 3. All participants reported increasing their knowledge of PDSA cycles, interpretation of QI data, evidence-based screening practices for substance use and mental health, principles of adolescent confidentiality, and best practices for managing adolescent substance use and mental health issues. Over 90% of participants reported that participation in TEAMSS improved or significantly improved their clinical care and clinic operations. Clinicians reported that participating in TEAMSS was a good return on investment of their time and resources.

Sustainability of improvement efforts

Clinics were surveyed nine months after completion of TEAMSS to assess intervention sustainability. 85% of clinics reported that they very much maintained changes made during TEAMSS, and 15% of clinics reported that they somewhat maintained changes. Changes sustained included screening for substance use and mental health, using EHR templates to screen and document follow-up of positive screens, using mobile devices to facilitate screening, conducting brief interventions, engaging a multidisciplinary team, conducting mental health training for staff, distributing naloxone, and gathering community resources.

Facilitators that helped clinics maintain interventions included EHR templates and alerts (63%), tracking performance on key measures (37%), developing clinic policies and protocols (37%), PDSA cycles (32%), incentives from health systems or insurance programs (26%), and modifying clinic infrastructure to allocate time and resources (26%). Barriers to sustaining improvements included challenges with continued clinician and staff engagement (30%), delays in integrating screening into EHR and mobile devices (15%), changes in funding and organizational priorities (15%), staff turnover (10%), lack of support in obtaining and analyzing data after the initiative ended (10%), and language and health literacy barriers for families (10%). On the 5-point Assessment Scale for Collaboratives [13] 40% of clinics reported a score of 4 (significant improvement; most changes were implemented with breakthrough improvement in measures) and 35% reported a score of 3.5 (improvement in measures, PDSA cycles completed, several changes implemented).

Discussion

Statement of principal findings

The TEAMSS QI learning collaborative significantly and sustainably improved screening for adolescent substance use, depression, anxiety, and suicide risk across 27 diverse U.S. primary care clinics. Follow-up for substance use improved significantly, while follow-up for depression, anxiety, and suicidality was high at baseline and did not significantly change. The virtual collaborative model combining synchronous and asynchronous learning with individualized coaching supported implementation of evidence-based practices, improved workflows, and enhanced care delivery for adolescents aged 12-18 years.

A phased, layered approach underpinned these improvements [14]. Early efforts focused on implementing substance use screening workflows, leading to significant gains across cycles 2-11; subsequent cycles emphasized counseling and referral processes, with improvements observed in cycles 8-10. Depression screening rates were high at baseline, likely reflecting established quality metrics, and increased modestly. In contrast, anxiety and suicide risk screening were less common initially and were adopted later, consistent with a staged implementation strategy. Since 2022 the Bright Futures/American Academy of Pediatrics Periodicity Schedule recommends universal suicide risk screening for youth aged 12 years and older [15]. Depression screening tools partially address suicide risk, and several clinics considered this an indirect suicide screen. We communicated to clinics that the PHQ-9 is not a validated suicide risk screener but allowed clinics to indicate if they used it as a suicide risk screener as part of a stepped approach to enhance their screening. Workflow adaptations developed for substance use were often extended to mental health, suggesting efficiencies in bundling related preventive services [16].

Adapting a QI learning collaborative to a virtual setting requires close attention to maintaining engagement with clinical teams. Several adaptations to traditional QI learning collaborative models, specifically shorter learning sessions, combining synchronous and asynchronous learning, and ongoing coaching helped enhance clinics' engagement and participation in TEAMSS. Approximately half of participating clinics in TEAMSS did not have prior QI experience, and the virtual format allowed these clinics to obtain individualized coaching and support, and reduced barriers related to transportation, time, and cost.

Interpretation within the context of the wider literature

In a national study by Ragan-Burnett et al 57% of clinicians reported routine adolescent substance use screening, however, 37% did not employ validated screening tools [17]. TEAMSS directly addressed this gap through training on validated instruments and workflow integration, resulting in increased use of standardized screening.

Chavez et al demonstrated that training clinic staff in modifying screening processes resulted in increase in screening for substance use. This increase was higher when a self-reported screening form was used, with less improvements seen with verbal screening [18]. Computer-administered screening for adolescent substance use is more effective than clinician-administered screening [19]. Consistent with this evidence, several TEAMSS clinics implemented technology-enabled, self-administered screening within the EHR, with peer learning across sites facilitating adoption.

A QI initiative by Glasser et al. increased depression screening for adolescents from 3% to over 80% and improved rates of referrals to mental health providers using EHR-based clinical decision support and medical assistant-led screening workflows. Their recommendations for system-level support, including automated scoring, clinical decision pathways, and performance feedback, align with strategies emphasized in TEAMSS [20].

Strengths and limitations

This study has several limitations. Clinical outcomes (e.g., changes in substance use, depression, or anxiety) were not assessed, formal comparisons between higher- and lower-performing sites

were not conducted, and the follow-up period was relatively short. Sustainment strategies were integrated into learning sessions and coaching calls, however maintaining gains in primary care interventions remains challenging particularly in high-volume clinics serving patients with complex needs [21]. Observed maintenance may reflect a combination of true workflow improvements, enhanced documentation, and temporary participation effects.

Despite these limitations, TEAMSS provides actionable evidence for clinics seeking to improve screening and follow-up for adolescent substance use and mental health using implementation-focused approaches. These findings are generalizable across diverse clinical and geographic settings, with 9-month follow-up data supporting feasibility and early sustainability. Materials in the TEAMSS change package to support replication, including select curricular content, a key driver diagram and a downloadable data collection tool, are publicly available [22].

Implications for policy, practice and research

Suicide risk screening occurred less frequently than depression and anxiety screening, highlighting an area for future interventions. Additional priorities for primary care include optimizing clinical workflows, strengthening billing and coding support, enhancing psychopharmacology training, and developing community partnerships. TEAMSS incorporated support for under-resourced clinics, including virtual learning, individualized technical assistance, and QI coaching. However, rural participation was limited, highlighting the need for future interventions to provide financial support or data infrastructure assistance to further address resource constraints.

Clinics made the greatest progress in implementing screening processes and tools while community collaboration was more challenging to implement. Community collaboration requires cross-system partnerships, funding, and leadership alignment which may be difficult to build and maintain, especially for smaller and less-resourced clinics given the relatively short duration of TEAMSS. It is important for future interventions to focus on developing community collaborations since they are challenging, yet critical interventions for long-term improvements in substance use and mental health outcomes.

Conclusions

Multifaceted interventions that engaged frontline primary care clinicians and clinic staff in enhancing workflows through peer learning and individualized coaching improved screening, brief intervention and follow-up for substance use, depression, anxiety, and suicide risk. The virtual format of TEAMSS was a cost-effective option for geographically dispersed clinics and offered a blend of experience, leveraging the guidance of clinics and individuals with expertise in QI alongside the innovative contributions of clinics newer to QI methodology. Adapting a learning collaborative approach to a virtual setting is effective but requires close attention to the ongoing support and engagement of healthcare teams in busy primary care clinics.

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Figures: Main Manuscript

Figure 1. Key driver diagram of interventions and change concepts in TEAMSS

Figure 2. Format of the TEAMSS learning collaborative

Figure 3. Time series analysis of rates of screening for substance use, depression, anxiety, and suicide risk during TEAMSS

Figure 4. Time series analysis of follow-up of positive screens for substance use, depression, anxiety, and suicide risk during TEAMSS

Tables: Main Manuscript

Table 1: Characteristics of participating clinics in TEAMSS

Supplemental Data

Table 2: Generalized Estimating Equation analyses to assess change in screening rate at clinics participating in TEAMSS

Table 3: Generalized Estimating Equation analyses to assess changes in follow-up to positive screenings at clinics participating in TEAMSS

Table 4: Quality improvement interventions implemented at clinics participating in TEAMSS

Figure 5. Control chart showing rates of screening for substance use during TEAMSS

Figure 6. Control chart showing rates of follow-up of substance use during TEAMSS

Figure 7. Control chart showing rates of screening for depression during TEAMSS

Figure 8. Control chart showing rates of follow-up of depression during TEAMSS

Figure 9. Control chart showing rates of screening for anxiety during TEAMSS

Figure 10. Control chart showing rates of follow-up of anxiety during TEAMSS

Figure 11. Control chart showing rates of screening for suicide risk during TEAMSS

Figure 12. Control chart showing rates of follow-up of suicide screening during TEAMSS

Table 1. Characteristics of participating clinics in TEAMSS

Clinic Characteristics		
Clinic Type	Number	Percentage
Medical school or parent university	9	33%
Pediatric group (3-10 pediatricians)	5	19%
Non-profit community health center	3	11%
Solo or two physician practice	3	11%
Pediatric group (>10 pediatricians)	1	4%
Non-government hospital or clinic	1	4%
Others	6	22%
Geographic Setting	Number	Percentage
Urban	21	78%
Suburban	5	19%
Rural	1	4%
Health Insurance	Mean (SD)	Range
Public	57.0(28.4)	1-96
Private	37.3(28.0)	0-98
Uninsured	4.3(11.1)	0-58
Military	1.4(2.3)	0-10

Abbreviations: SD, standard deviation.

Table 2. Generalized Estimating Equation analyses to assess change in screening rate at clinics participating in TEAMSS

	Substance Use			Depression			Anxiety			Suicide Risk		
	Exp(B)	95% CI	p	Exp(B)	95% CI	p	Exp(B)	95% CI	p	Exp(B)	95% CI	p
Number of Patients (natural log)	2.58	2.28–2.89	<.001	2.62	2.43–2.82	<.001	3.22	2.01–5.14	<.001	1.93	1.60–2.33	<.001
Cycle 1 (Baseline) ¹	1.00	-	-	1.00	-	-	1.00	-	-	1.00	-	-
Cycle 2	1.38	1.09–1.96	0.01	1.04	0.98–1.11	0.20	1.04	0.82–1.33	0.73	0.97	0.52–1.82	0.94
Cycle 3	1.59	1.27–2.36	0.001	1.08	1.00–1.17	0.07	1.53	1.06–2.20	0.02	1.50	1.05–2.76	0.20
Cycle 4	1.79	1.33–2.68	<.001	1.07	1.01–1.14	0.02	1.78	1.22–2.59	0.003	1.64	1.12–3.03	0.11
Cycle 5	1.75	1.29–2.63	0.001	1.08	1.00–1.16	0.05	1.78	1.21–2.61	0.004	1.53	0.83–2.84	0.17
Cycle 6	1.82	1.32–2.75	0.001	1.08	1.00–1.16	0.05	1.82	1.22–2.69	0.003	1.67	0.90–3.10	0.11
Cycle 7	1.92	1.38–2.93	<.001	1.07	0.98–1.15	0.12	1.93	1.27–2.94	0.002	1.52	0.81–2.85	0.19
Cycle 8	1.81	1.33–2.70	<.001	1.07	0.97–1.18	0.18	1.89	1.25–2.87	0.003	1.61	0.87–2.99	0.13
Cycle 9	1.93	1.37–2.99	<.001	1.13	1.03–1.23	0.008	1.98	1.33–2.94	0.001	1.94	1.05–3.58	0.04
Cycle 10	1.99	1.41–3.10	<.001	1.12	1.04–1.21	0.004	2.02	1.36–3.01	0.001	1.86	1.01–3.43	0.047
Cycle 11	2.03	1.43–3.17	<.001	1.11	1.03–1.19	0.007	2.10	1.42–3.11	<.001	2.08	1.14–3.80	0.02

¹ Referent time point.

Abbreviations: Exp(B), incidence rate ratio on the original rate scale; CI, confidence interval.

Table 3. Generalized Estimating Equation analyses to assess changes in follow-up to positive screenings at clinics participating in TEAMSS

	Substance Use			Depression			Anxiety			Suicide Risk		
	Exp(B)	95% CI	p	Exp(B)	95% CI	p	Exp(B)	95% CI	p	Exp(B)	95% CI	p
Number of Positive Screens (natural log)	2.80	2.53–3.08	<.001	2.63	2.36–2.94	<.001	2.69	2.41–3.02	<.001	2.65	2.56–2.75	<.001
Cycle 1 (Baseline) ¹	1.00	-	-	1.00	-	-	1.00	-	-	1.00	-	-
Cycle 2	1.11	0.80–1.52	0.54	0.97	0.84–1.12	0.70	0.96	0.81–1.14	0.65	0.97	0.70–1.36	0.87
Cycle 3	1.11	0.82–1.51	0.51	1.06	0.91–1.23	0.45	1.00	0.86–1.17	0.10	1.02	0.90–1.17	0.74
Cycle 4	1.19	0.87–1.65	0.28	1.08	0.93–1.24	0.32	1.01	0.90–1.13	0.86	1.04	0.77–1.42	0.79
Cycle 5	1.22	0.91–1.63	0.19	1.15	1.00–1.33	0.05	1.02	0.91–1.14	0.76	1.04	0.87–1.24	0.64
Cycle 6	1.08	0.84–1.40	0.54	1.05	0.94–1.17	0.39	0.97	0.85–1.11	0.69	1.14	0.99–1.30	0.06
Cycle 7	1.25	0.94–1.65	0.12	1.04	0.83–1.30	0.75	0.94	0.77–1.14	0.51	1.12	0.97–1.29	0.11
Cycle 8	1.40	1.05–1.86	0.02	1.08	0.88–1.32	0.46	1.04	0.92–1.19	0.53	1.05	0.85–1.31	0.65
Cycle 9	1.37	1.04–1.81	0.02	1.33	1.06–1.68	0.02	1.11	0.95–1.29	0.18	1.13	0.99–1.30	0.08
Cycle 10	1.40	1.05–1.86	0.02	1.30	1.08–1.57	0.01	1.19	1.00–1.41	0.05	1.12	0.97–1.29	0.12
Cycle 11	1.26	0.93–1.70	0.14	1.04	0.92–1.18	0.48	1.02	0.90–1.15	0.81	1.01	0.86–1.18	0.95

¹ Referent time point.

Abbreviations: Exp(B), incidence rate ratio on the original rate scale; CI, confidence interval

Table 4: Quality improvement interventions implemented at clinics participating in TEAMSS

	N	% (of survey respondents)
Changed approach to substance use screening	21	95.5%
Started screening	6	27.3%
Standardized screening or made routine	5	22.7%
Changed screening tool	8	36.4%
Other workflow or documentation changes	8	36.4%
Developed patient/family educational materials	1	4.5%
Other	0	0%
Changed approach to depression screening	13	59.1%
Started screening	1	4.5%
Standardized screening or made routine	4	18.2%
Changed screening tool	1	4.5%
Other workflow or documentation changes	9	40.9%
Developed patient/family educational materials	1	4.5%
Other	0	0%
Changed approach to anxiety screening	15	68.2%
Started screening	5	22.7%
Standardized screening or made routine	6	27.3%
Changed screening tool	1	4.5%
Other workflow or documentation changes	4	18.2%
Developed patient/family educational materials	1	4.5%
Other	1	4.5%

Changed approach to suicide risk screening	13	59.1%
Started screening	6	27.3%
Standardized screening or made routine	5	22.7%
Changed screening tool	0	0
Other workflow or documentation changes	5	22.7%
Developed patient/family educational materials	0	0
Other	1	4.5%