

An Integrative Behavioral Health Care Model Using Automated SBIRT and Care Coordination in Community Health Care

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Abstract

Efficient and effective integration of behavioral health programs in a community health care practice emphasizes patient-centered medical home principles to improve quality of care. A prospective, 3-period, interrupted time series study was used to explore which of 3 different integrative behavioral health care screening and management processes were the most efficient and effective in prompting behavioral health screening, identification, interventions, and referrals in a community health practice. A total of 99.5% ($P < .001$) of medical patients completed behavioral health screenings; brief intervention rates nearly doubled to 83% ($P < .001$) and 100% ($P < .001$) of identified at-risk patients had referrals made using a combination of electronic tablets, electronic medical record, and behavioral health care coordination.

Keywords

community health centers, efficiency, impact evaluation, patient-centeredness, practice management, primary care, program evaluation

Introduction

Patients frequently present to primary care medical practices with mental and behavioral health (BH) concerns.¹⁻³ Psychological stress and disability often accompany many chronic illness encounters in medical practices.⁴ However, these conditions remain underdiagnosed⁵ and their successful management in the primary care setting has been mixed.^{6,7}

An integrated health care delivery model offering mental health services in primary care settings can increase access for patients and improve provider satisfaction in treatment and coordination of care.⁸ Survey studies indicate BH processes in the clinical setting are favorable and acceptable to patients and medical providers.⁹ In addition, principles advocating the patient-centered medical home concept of coordinated and integrated patient care with a whole person orientation¹⁰ support BH care services in an integrative medical care setting.

The Ohio North East Health Systems (ONE Health Ohio), a Federally Qualified Health Center (FQHC), introduced the Screening, Brief Intervention, and Referral to Treatment (SBIRT) program in February 2013 as part of an overall quality improvement initiative to improve identification of medical patients with comorbid BH conditions.¹ Successful identification of these conditions, yet

experiencing low patient-kept-appointment rates when referred to external BH counselors, led to the development of an integrated health care delivery model. Full-time BH counselors and BH care coordinators were embedded into the practice setting to support the integration effort by October 2014.

Three integrative BH screening and management processes were tested and studied for clinical efficiency and effectiveness as a prospective, 3-period interrupted time series. The methods included the following processes (A) patients using electronic tablets to complete both a BH screening tool and personal demographic and insurance intake data with no BH care coordinator to support the patient and the process. (B) patients using a paper BH screening tool only with no BH care coordinator support, and (C) patients using electronic tablets to complete a BH screening tool with BH care coordinator support.

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Methods

All data were obtained from the Youngstown Community Health Center (YCHC), 1 of 6 primary care FQHC facilities in northeast Ohio operated by ONE Health. YCHC draws from a target population where more than 90% are at or lower than 200% of the federal poverty level and 93% are uninsured, on Medicaid and/or Medicare. In 2015, ONE Health encountered more than 60 000 patient visits representing 20 000 patients.¹¹

Efficiency for each process was evaluated by time analysis, BH screening completions, documented brief interventions, referral rates and BH counselors kept-appointment data from each of three sequential time periods were used to determine effectiveness. Three time periods were compared using different combinations of electronic documentation, paper screening, and BH care coordinators with the integrative process. The primary role of the BH care coordinators (all with at least a bachelor's degree in psychology or social work) was to assure completion of screening processes, assure brief interventions were performed and document compliance as well as coordinate referrals and appointments. Full-time licensed independent behavioral health counselors (all master's level, Licensed Professional Clinical Counselor [LPCC] and a Licensed Independent Social Worker [LISW]), embedded into the clinical practice, were available for services during all 3 study periods.

Process A (Electronic Tablets Used for Both BH Screening and Demographic/Insurance Intake With No BH Care Coordination Support)

Hewlett Packard Elite Pad electronic touch screen tablets (e-tablets) were customized and used by all medical patients 18 years and older with every encounter to complete demographic/insurance information and to complete the SBIRT screening tool at check-in. The BH screening questions (made up of 2 questions regarding alcohol consumption; 1 question on use of recreational drugs and/or prescription drugs and 2 questions on mood) are designed using a nominal scale (yes/no). Those patients with positive (yes) SBIRT screenings were automatically prompted to complete one or more of the following appropriate (based on the results of screening tool) and quantifiable standardized tests if not performed in the past 6 months: The Drug Abuse Screening Test (DAST), Alcohol Use Disorders Identification Test (AUDIT), and the Patient Health Questionnaire (PHQ-9). The e-tablet screening results automatically interfaced with the electronic medical record (EMR), NextGen Automated EHR (<http://www.nextgen.com>). All medical providers could view scores, complete a brief intervention and make a behavioral health referral or initiate pharmacotherapy if indicated by a standardized recommendation scale.

For all positive SBIRT scores, a brief intervention conducted by the medical provider consisting of short discussions, recommendation of positive findings, dissemination of literature relevant to the condition identified; and/or prescribing of medications if indicated were performed. Those requiring further intervention and/or counseling were directed via a clinical RN to an in-house BH counselor. Patients who were assessed with severe BH issues were referred to inpatient facilities for further evaluation and treatment.

Process B (Paper Screenings Only)

BH screenings were completed by a paper format with no support from BH care coordinators. Demographic/insurance information were collected separately by front desk clerical personnel through face-to-face interviews bypassing the e-tablets.

Results were manually entered by the nursing staff into the EMR following completion and prior to the medical provider's encounter with the patient. For patients with positive SBIRT screening results, clinical nurses coordinated further standardized testing and subsequent referrals.

Process C (Electronic Tablets Were Used for Behavioral Screening Only. A BH Care Coordinator Was Added in This Process)

Customized e-tablets were returned to the clinical area to obtain only SBIRT screening data (without demographic/insurance collection). Demographic/insurance information were collected separately by front desk clerical personnel through standard check-in processes, bypassing the e-tablets. The same processes occurred as indicated in process A for all positive tested patients.

A full-time BH care coordinator was added to this study period whose roles were to perform brief interventions with positive SBIRT patients when providers were unable; to assure proper documentation into the EMR, and confirm that referrals were coordinated and completed with in-house BH counseling services or external behavioral health referrals when indicated. The BH care coordinators are experienced BH case managers who received on-site training in ONE Health's BH screening processes and the EMR system.

Results

Cohorts across the 3 time periods were similar in demographic characteristics, sample size, and percentage of positive SBIRT scores, indicating that different time periods were not a significant confounding variable in the study.

In Table 1, the total number of encounters ranged from 1508 to 1821 for the 3 groups. Process A had the highest

Table 1. SBIRT^a by Encounter Characteristics.^b

	Process			P
	A (June 16, 2015 to October 10, 2015)	B (October 11, 2015 to January 3, 2016)	C (January 4, 2016 to March 4, 2016)	
SBIRT delivery method	E-tablets with both SBIRT and demographic intake; no care coordinator	Paper SBIRT only	E-tablets with SBIRT only; care coordinator	
Total eligible SBIRT encounters ^c	1821	1585	1508	
SBIRTs given (% completed)	1640 (90.1)	1500 (94.6)	1501 (99.5)	<.001
SBIRTs refused (%)	174 (9.6)	38 (2.4)	4 (0.3)	<.001
SBIRTs missed ^d (%)	7 (0.4)	47 (3.0)	3 (0.2)	<.001
Positive SBIRTs (%)	756 (46.1)	653 (43.5)	641 (42.7)	.134
Brief intervention documented (%)	334 (44)	314 (48)	531 (83)	<.001

^aThe term SBIRT (Screening, Brief Intervention and Referral to Treatment) is a “catch-all” phrase to describe the behavioral health screening program. This primarily refers to behavioral health screening process.

^bEach period was distinct after post hoc testing unless boldfaced to indicate only 1 distinct study period result.

^cEligible encounters are defined as medical patients at Youngstown Community Health Center who are 18 years or older.

^dMissed are due to clerical error or failure to document.

Table 2. Referral to Behavioral Health Counseling Characteristics.

	Process A	Process B	Process C	P
SBIRT delivery method	E-tablets with both SBIRT and demographic intake; no case management	Paper SBIRT only	E-tablets with SBIRT only; case management	
Total eligible referrals ^a	50	62	94	.273
Total referrals, n (%)	38 (76.0)	27 (43.5)	94 (100)	<.001
Referrals in-house, n (%)	30 (78.9)	23 (85.2)	91 (96.8)	.002
In-house referrals kept, ^b n (%)	22 (73)	14 (61)	61 (67)	

^aEligible referrals defined as those individuals receiving brief intervention who are not currently in counseling or on medication.

^bReferrals kept during the defined time period.

rate (9.6%) of SBIRT screening refusals as compared with 2.4% and 0.3% for processes B and C, respectively. Process B, characterized by the use of paper BH screening tool only, exhibited a significantly higher percentage of screenings that were missed or not properly documented at 3% compared with 0.4% for process A and 0.2% for process C. Process C resulted in the highest patient completion of brief interventions (83%) as compared with 44% and 48% for processes A and B, respectively.

Table 2 indicates 100% of the eligible referrals were referred to counseling in process C as compared with 76% and 43% for processes A and B, respectively. The in-house behavioral health counseling improved to 96.8% for process C as compared with 79% and 85% for processes A and

B, respectively. The in-house-referrals-kept remained constant throughout all 3 processes.

Table 3 indicates the total appointment time for all patients remained relatively constant with all three processes. Process C required the most time with a median time of 61.5 minutes per total clinical time with processes A and B taking 56 and 61 minutes, respectively.

Discussion

A fully integrated, efficient, and effective BH program promotes the success of the chronic care or disease management model of primary health care delivery, which encourages “both the early identification in primary care of

Table 3. Appointment Throughput Time (Minutes).^a

	Process A	Process B	Process C	
SBIRT delivery method	E-tablets with both SBIRT and demographic intake; no care coordinator	Paper SBIRT only	E-tablets with SBIRT only; case management	
Mean (SD)	71.5 (164.36)	72.2 (72.03)	76.3 (96.45)	
Median (interquartile range)	56 (42-76)	61 (46-82)	61.5 (45-81)	<i>P</i> < .001

^a*P* values for categorical variables from Pearson chi-square tests. Post hoc Bonferroni adjusted *z* tests were performed for significant overall test. Each period was distinct after post hoc testing unless boldfaced to indicate only 1 distinct study period result. *P* values for numeric variables from Kruskal-Wallis tests. Post hoc Bonferroni adjusted Mann-Whitney *U* tests were performed for significant overall test. Each period was distinct after post hoc testing unless boldfaced to indicate only 1 distinct study period result.

populations that are at risk for costly chronic disease and the provision of educational orientation and evidence-based algorithms.”⁴ The primary interest in this study was to discern which clinical process had the most positive impact on effectiveness and efficiency as it related to integrating BH in the medical clinical area.

Effectiveness

The addition of a dedicated BH care coordinator significantly improved the effectiveness of the model. This is evidenced, in part, by the improved SBIRT screening completion rates, decline of screening refusals, improved documented brief interventions performed and appointment referral rates in process C (Table 2). As a result, the percentage of patients receiving brief interventions nearly doubled to 83%. (Table 1) These results indicate that using e-tablets with a patient care coordinator and focusing solely on the screening process by eliminating demographic/insurance intake through e-tablets facilitated a more effective brief intervention process (*P* < .001, Table 1). Using the e-tablet to collect demographic/insurance information became prohibitive for the patients due to its lengthy and tedious nature during process A. It was recognized that this may be a significant reason why the SBIRT completion rate was relatively low and the SBIRT refusal rate was high during process A. Thus, it was decided not to combine the demographic/insurance intake information with the BH screening in processes B and C. This did result in an increase completion rates and a decline in the refusal rates (Table 1).

Efficiency

The median throughput time was 5 minutes less for time period 1 versus time periods 2 and 3, indicating that the implementation of a more effective brief intervention and referral process (C) only added 5 additional minutes to the typical patient visit (*P* < .001, Table 3). The time analysis (*P* < .001) study, indicates negligible differences in the different

processes; however, the improvement in effectiveness indicated in process C within similar appointment throughput time indicates relative efficiency has improved despite the increase in time.

This time study was broadly applied to all patients regardless of their BH screening results and subsequent disposition since all medical patients 18 years and older were included in the process. The interest being the overall effect on the increased time experiences patients and providers would encounter by implementing the different processes identified.

Overall Effect

In process C, those eligible for counseling referrals increased to 94 patients compared with 50 and 62 for processes A and B, respectively (Table 2). This increase in eligibility coincides with the increase in documented brief interventions performed for this process (C) suggesting the addition of the BH care coordinator and elimination of a concomitant requirement to complete demographic/insurance data assured more comprehensive completion of the full screening and brief intervention process. Although process C resulted in 67% kept-appointment rates (Table 2), this process did not have the highest rate of kept-appointments primarily due to the limitation of counselors managing a larger patient caseload and the inability to address referrals immediately while patients were on-site. Patients were given a referral appointment for the next business date; however, many did not keep those appointments.

However, the kept-appointment rate did significantly improve compared to a previous ONE Health study.¹ Of the medical patients who were recognized to have BH problems when screened, only 24.4% of those referred kept their appointments with outside BH agencies. The addition of an embedded BH counseling program in the clinical setting, along with an automated and supportive process improved identification of those patients requiring counseling and ongoing comprehensive care. Thus, integrating BH with

other clinical disciplines through automation and care coordination improves kept-appointment rates.

This study is limited in that only a single center was studied and there are no confounding effects of time with outcomes since there were no parallel studies but rather one that continued across 3 time epochs. Also, the study did not analyze time differences for patient groups who were negative or positive for the BH screening processes. This process supports the concept of patient-centered medical home principles and encourages replication of this model to improve the quality of the integrative health care delivery processes.

The findings of this investigation indicate the best BH integrative health care delivery process in a large clinical outpatient setting includes the combined use of EMR, e-tablets to efficiently screen and identify at-risk patients, and incorporating BH care coordinators to improve effectiveness and efficiency of screening, identifying, and treating BH patients. The study also reveals when collecting BH information from patients through a screening process, it is better to avoid concurrently grouping data collecting such as patient demographic and/or insurance data. A significant decline to participate in BH screening processes can result.

Authors' Note

The views expressed in the submitted article are the authors' own and not an official position of the Ohio North East Health Systems, Inc.

Declaration of Conflicting Interests

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