AN INTEGRATIVE BEHAVIORAL HEALTH CARE MODEL USING AN AUTOMATED SBIRT PROCESS 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, three-period, interrupted time series study was used to explore which of three different integrative behavioral healthcare screening and management models were the most efficient and effective in prompting behavioral health screening, identification, interventions, and referrals in a community health practice.

99.5% (p<0.001) of medical patients completed behavioral health screenings; brief intervention rates nearly doubled to 83% (p<0.001) and 100% (p<0.001) of identified at-risk patients had referrals made using a combination of electronic tablets, EMR and care coordination.
Introduction

Patients frequently present to primary care medical practices with mental and behavioral health concerns.\textsuperscript{1,2,3} Psychological stress and disability often accompany many chronic illness encounters in medical practices.\textsuperscript{4} However, these conditions remain under-diagnosed\textsuperscript{5} and successful management of them in the primary care setting have been mixed.\textsuperscript{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 access and coordination of care.\textsuperscript{8} Survey studies indicate behavioral health processes in the clinical setting are favorable and acceptable to patients and medical providers.\textsuperscript{9} In addition, principles advocating the patient-centered medical home concept of coordinated & integrated patient care with a whole person orientation to improve patient care delivery\textsuperscript{10} support behavioral health 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 co-morbid behavioral health conditions.\textsuperscript{1} Successfully identifying these conditions, yet experiencing low patient-kept-appointment rates when referred to external behavioral health counselors, led to the development of an integrated health care delivery model. By mid-2014, full-time behavioral health counselors were embedded in the practice setting to support the integration effort.

A prospective, three-period, interrupted time series study was used to explore which of three different integrative behavioral healthcare screening and management models were most
efficient and effective in prompting behavioral health screening, identification, interventions, and referrals in a community health clinic.

Methods

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

Time analysis for each of the models was used to measure efficiency while screening completions, brief interventions, referral rates and kept-appointment data with behavioral health counselors from each of three sequential time periods were used to determine effectiveness.

Three model time periods were compared utilizing different combinations of electronic documentation, paper screening and care coordinators with the integrative process. Full-time behavioral health counselors were assigned to the medical clinical areas during all three study periods.

Model Time Period 1 (Electronic tablets used for both behavioral screening and demographic intake with no case management):

Hewlett Packard Elite Pad electronic touch screen tablets (e-tablets) were customized and utilized by all medical patients 18 years and older with every encounter to collect demographic and insurance information as well as to complete the SBIRT screening at check-in. Those patients eliciting positive SBIRT screenings were given one or more of the following appropriate 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 providers were able to view scores, perform a brief intervention and make a behavioral health referral or initiate pharmacotherapy if indicated by a standardized recommendation scale.

A brief intervention was recommended for every patient with a positive screening SBIRT score. Those requiring further intervention and/or counseling were directed to an in-house behavioral health counselor. Patients were referred to external agencies when they required more intensive levels of care.

Model Time Period 2 (Paper screenings only):

Behavioral health screenings were completed via a paper format. Results were manually entered by the nursing staff into the EMR following completion and prior to the medical provider’s encounter with the patient. The same process occurred as indicated in Time Period 1 for all positive tested patients.

Model Time Period 3 (Electronic tablets were used for behavioral screening only. A care coordinator was added in this model):

Customized electronic tablets were returned to the clinical floor to obtain only SBIRT screening data (without demographic collection). The same processes occurred as indicated in Model Time Period 1 for all positive tested patients.

A full-time patient care coordinator was added to this model period whose roles were to perform brief interventions with positive SBIRT patients when providers were unable; to assure
proper documentation into the EMR, and to confirm referrals were completed with in-house counseling services or external behavioral health counseling. The care coordinator is an experienced behavioral health case manager who received on-site training in ONE Health’s behavioral health screening processes and the EMR system.

**Results**

Cohorts across the three 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. Total number of encounters ranged from 1508 to 1821 for the three groups (Table 1).

Model Time Period 1 had the highest rate (9.6%) (Table 1) of SBIRT screening refusals while Model Time Period 2, characterized by the use of paper screening tools only, exhibited a significantly higher percentage of screenings that were missed or not properly documented (p<0.001, Table 1). Model time period 3 resulted in 99.5% of patients being screened. As a result, the percentage of patients receiving brief interventions nearly doubled to 83%. These results indicate that utilizing e-tablets with a patient care coordinator facilitated a more effective brief intervention process. (p<0.001, Table 1).

Additionally, during time period 3, those eligible for counseling referrals increased to 94 patients compared to 50 and 62 for models 1 and 2 respectively. This increase in eligibility coincides with the increase in documented brief interventions performed for this model. While 94 referrals were made, 67% kept their appointments.
The median throughput time was five 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 only added five additional minutes to the typical patient visit (p<0.001, Table 3).

**Discussion**

A fully integrated, efficient, and effective behavioral health program promotes the success of the chronic care or disease management model of primary healthcare delivery, which encourages “both the early identification in primary care of populations that are at risk for costly chronic disease and the provision of educational orientation and evidence-based algorithms”.

This study indicates that automation through the use of e-tablets and EMR for behavioral health screening and treatment improves efficiency, although it was evident that automation alone was not enough to prompt brief interventions and referrals. Time analysis (p<0.001), indicates negligible differences in the models; however, the improvement in effectiveness in model 3 within similar appointment throughput time indicates efficiency has improved.

The addition of a dedicated care coordinator to assure appropriate screening processes, interventions and documentation compliance as well as coordination of referrals and appointments significantly improved the effectiveness of the model. In part, this is evidenced by the documented brief interventions performed and appointment referrals in Model Time 3. Although time period 3 resulted in 67% kept-appointment rate; the Model did not have the highest rate of kept-appointments due primarily to the limitation of the counselor managing new and current patient caseloads (Table 2). However, the kept-appointment rate significantly improved compared to a previous ONE Health study\(^1\) where only 24.4% of the referred patients kept their appointments to outside behavioral health counselors. Thus, integrating behavioral counseling into the clinical setting 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 three time epochs.

The findings of this investigation indicate the best delivery model for an integrative behavioral health program in a large medical setting is the use of EMR, including e-tablets, to efficiently screen and identify at-risk patients and incorporating a care coordinator to improve the effectiveness by increasing at-risk intervention rates and assuring prompt referrals. This process supports the concept of patient-centered medical home principles and encourages replication of this model improving the quality of the integrative health care delivery process.
Table 1 - SBIRT* by Encounter Characteristics

<table>
<thead>
<tr>
<th>Time Period</th>
<th>1 (06/16/2015-10/10/2015)</th>
<th>2 (10/11/2015-01/03/2016)</th>
<th>3 (01/04/2016-03/04/2016)</th>
<th>p values</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBIRT Delivery Method</td>
<td>e-tablets w/ both SBIRT and demographic intake; no care coordinator</td>
<td>Paper SBIRT only</td>
<td>e-tablets with SBIRT only; care coordinator</td>
<td></td>
</tr>
<tr>
<td><strong>Total Eligible SBIRT Encounters</strong></td>
<td>1821</td>
<td>1585</td>
<td>1508</td>
<td></td>
</tr>
<tr>
<td>SBIRTs Given (%) Completed</td>
<td>1640 (90.1%)</td>
<td>1500 (94.6%)</td>
<td>1501 (99.5%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>SBIRTs Refused</td>
<td>174 (9.6%)</td>
<td>38 (2.4%)</td>
<td>4 (0.3%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>***SBIRTs missed</td>
<td>7 (0.4%)</td>
<td>47 (3.0%)</td>
<td>3 (0.2%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Positive SBIRTs (%)</td>
<td>756 (46.1%)</td>
<td>653 (43.5%)</td>
<td>641 (42.7%)</td>
<td>0.134</td>
</tr>
<tr>
<td>Brief Intervention Documented (%)</td>
<td>334 (44%)</td>
<td>314 (48%)</td>
<td>531 (83%)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

*The term SBIRT became a “catch-all” phrase to describe the behavioral health screening program.

**Eligible encounters is defined as medical patients at YCHC who are 18 years or older

***Missed are due to clerical error or failure to document

Each period was distinct after post-hoc testing unless bolded to indicate only one distinct study period result.
Table 2- Referral to Behavioral Health Counseling Characteristics

<table>
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<td>e-tablets with SBIRT only; case management</td>
<td></td>
</tr>
<tr>
<td>*Total Eligible Referrals</td>
<td>50</td>
<td>62</td>
<td>94</td>
<td>0.273</td>
</tr>
<tr>
<td>Total # Referrals</td>
<td>38 (76.0%)</td>
<td>27 (43.5%)</td>
<td>94 (100%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Referrals In-house</td>
<td>30 (78.9%)</td>
<td>23 (85.2%)</td>
<td>91 (96.8%)</td>
<td>0.002</td>
</tr>
<tr>
<td>In-House Referrals Kept</td>
<td>22 (73%)</td>
<td>14 (61%)</td>
<td>61 (67%)</td>
<td></td>
</tr>
</tbody>
</table>

*Eligible referrals defined as those individuals receiving brief intervention who are not currently in counseling or on medication
**Referrals kept during the defined time period.
Table 3- Appointment Throughput Time (Minutes)

<table>
<thead>
<tr>
<th>Time Period</th>
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</tr>
<tr>
<td>Mean (SD)</td>
<td>71.5 (164.36)</td>
<td>72.2 (72.03)</td>
<td>76.3 (96.45)</td>
</tr>
<tr>
<td>Median (IQR)</td>
<td>56 (42-76)</td>
<td>61 (46-82)</td>
<td>61.5 (45-81)</td>
</tr>
</tbody>
</table>

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 bolded to indicate only one 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 bolded to indicate only one distinct study period result.


