A prospective study on the implementation and documentation of the PSC-Y adolescent depression screen in an academic outpatient pediatric clinic

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Introduction:
An estimated 8% of adolescents between 12 to 17 years of age experience symptoms of major depression in any given year with only a third of these children receiving psychological services, equating to roughly 600,000 children in the US and 10,000 children in South Carolina. (1) According to the World Health Organization, unipolar depression is the leading cause of years lost to disability in ages 10 to 19 years. (2) Morbidities include obesity, poor perception of health, increased “screen time”, poor parental interactions, poor school performance, and increased incidence of at-risk behaviors. These and many other adverse health behaviors continue into adulthood when not addressed. (3) Also, suicide is the third leading cause of death in children from 10 to 24 years of age. (4)

Roughly 50% of all adolescents are seen by their primary care physician for routine health care each year, and of these physicians only 23% endorse routinely screening for depression. (5) This has led to an estimated two thirds of adolescents with depression not being identified by their doctor. (6) Racial and ethnic disparities have also been identified in those adolescents who are screened. (7) Of the adolescents who attempt suicide roughly 83% were not recognized as being suicidal by their primary physician. (8) Also, an estimated 45% of suicide victims had visited their primary care provider in the month prior to their death. (9)

On February 24, 2014 The American Academy of Pediatrics revised their recommendations for screening at well child visits to include screening for depression between the ages of 11 to 21 years. In the recommendation they referenced a number of depression screens including the PHQ-9, PSC, and the PSC-Y. The Pediatric Symptom Checklist (PSC) is a validated parent-report questionnaire designed for use in the pediatric primary care setting. (10) The use of the PSC has been shown to increase referral rates for psychological services in the pediatric population from 2% to 12%. What is more striking is a drop back to a 2% referral rate when the PSC was discontinued in the same setting indicating the effectiveness of the screening tool. (11) Concern for under-reporting by parents or caregivers led to the implementation of a modified PSC, the PSC-Y, to be used as a self-report questionnaire. When implemented in a secure setting away from parents and caregivers the PSC-Y has been shown to identify 20% of children between the ages of 9 to 14 years who lived in a small city, and 14% of youth 13 to 18 years of age who live in an inner city. The screen also identified 3% of youth between 11 to 18 years of age had suicidal ideation and 2% had actually attempted suicide. (12)

The Palmetto Health Children’s Hospital Outpatient Clinic is a resident staffed academic pediatric clinic. The purpose of this quality improvement project was to initiate a depression screen, the PSC-Y, in our academic pediatric clinic in order to improve
identification of those adolescents with depressive symptoms. Prior to this study there was no standardized method of screening for depression in our clinic. By the end of the study our goal was to have a workflow that would screen 90% of patients at well child checks between the ages of 13 to 18 years. A second aim was to ask if the rates of positive screens in our academic clinic match those described in the original validation study by Pagano et.al. (12) By initiating the depression screen we hope to improve the identification of children at risk of major depression and provide them with care and referrals as needed to psychiatric professionals.

**Methods:**
The PSC-Y was administered in both English and Spanish to adolescents between the ages of 13 and 18 years at the beginning of their well child visits. The patient and parent were instructed to allow the patient to complete in confidentiality. The screen was then taken by the resident at the beginning of the visit and scored during the visit. A score of $\geq 30$ or answering yes to suicidality or suicide attempts was considered positive and warranted further action. The resident was asked to document the outcome of the depression screen in the electronic medical record followed by handing the physical copy of the PSC-Y into the attending for scanning into the electronic medical record. The electronic medical records were then reviewed for those patients between the ages of 13-18 years during 4 week PDSA cycles to determine the number of patients screened and documented during that time point. For each 4 week interval the results were tallied and changes were made with the intent to improve the number of patients screened with an end point of at least 90% of all comers screened.

The data was collected for each patient including MRN, age, sex, screen results and outcomes of positive screens. The number of positive screens for depressive symptoms and suicidality was then evaluated as a percent of the total patients screened. Patient confidentiality was kept by using MRNs linked to depression screen results. No names were recorded.

**Results:**

**Cycles**
At the beginning of cycle #1 a short 20 minute presentation on the PSC-Y screen and how to grade it was presented to the audience at our monthly outpatient clinic quality improvement meeting. Copies of the PSC-Y were made available in the front office and the nursing staff was individually asked to hand out the screen to the patients. At the beginning of cycle #2 the residents that were scheduled to rotate in the clinic during the following 4 weeks were given a 10 minute PowerPoint presentation in a small group about scoring the screen and documentation in the chart. The screens were better organized in a handout system in the front office. At the beginning of cycle #3 a short presentation was given at the next outpatient quality improvement lecture on the results of the first 8 weeks of implementation. The nursing staff was reminded by the nurse manager to hand out the screen. An email with a PowerPoint presentation about the PSC-Y screen was sent to all pediatric residents with a request to document the results. At the beginning of the cycle #4 the data for the preceding 12 weeks was again presented at the
monthly clinic quality improvement meeting with a request to continue the same. No other change was made.

Data

<table>
<thead>
<tr>
<th></th>
<th>Average</th>
<th>S.D.</th>
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<tbody>
<tr>
<td>Number of Patients</td>
<td>22.3</td>
<td>3.6</td>
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<tr>
<td>Age (years)</td>
<td>15</td>
<td>1.56</td>
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<tr>
<td>% Female</td>
<td>48%</td>
<td>4%</td>
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There were a total 89 children between the ages of 13 to 18 years that were seen for well child exams in a 16 week period. As seen in the above figure there were on average 22 patients screened for each cycle. There was no appreciable difference in the average age or sex between the four cycles. Ethnicity was not recorded.

![Percent of PSC-Y Screens](image)

As seen in Figure #1 there was a steady increase in the number of adolescents aged 13 to 18 years screened as a percentage of all 13 to 18 year well child visits. The percent documented in the daily note also increased accordingly, but always lagged behind the percent screened. This is due to the fact that the PSC-Y screens were performed and scanned in the electronic chart, but were not documented in the daily note. There was no
appreciable difference in the percent positive between all four cycles. Not shown is the percent found to have suicidal thoughts or attempts. The numbers were small but did equate to roughly 2% when you combine all cycles together. There were four referrals made for counseling, two referrals for post trauma resources due to assault, and two office discussions with follow-up in the office.

Discussion:
Based on the this Quality Improvement Project we have permanently added the PSC-Y to our battery of screening tools in our academic resident staffed pediatric outpatient clinic at Palmetto Health Richland. The screen successfully identified teens at risk of depression and incited conversations that ultimately led to referrals for those children at greatest risk. Although we were able to screen 85% of teens between 13-18 years by the end of the last PDSA cycle, we failed to completely implement the screen for greater than 90%, which was one of our markers of success. Barriers to reaching the 90% goal included poor documentation by visiting residents from other departments, medical student documentation, and the loss / non-scanning of the original PSC-Y document into the electronic medical record.

Although we were unable to reach our goal of 90% screened we did find that of the patients that were screened we had a 10% positive screen rate and a 2% suicidal ideation rate. This matches closely with published data that showed a 14% positive screen rate for depression and 3% suicidal ideation rate for adolescents between 13 – 18 years of age in a small city. (12) This comparative data further validates the use of the PSC-Y in our clinic.

In the future we plan to focus on better ways of educating our visiting residents and medical students on the PSC-Y screen as well as better ways to capture the original documents into the medical electronic medical record. We plan to expand the screen to 11 and 12 year old children per the AAP recommendation, and to possibly add the screening tool to our ADHD follow-up population. It would be interesting at years end to retrospectively review the number of depression or mood disorders diagnosed or referred for before and after implementation of the PSC-Y screen.

References:
2.  
5. Adolescent patients - Healthy or hurting? Missed opportunities to screen for suicide risk in the primary care setting. Frankenfield D, Keyl P, Gielen A, Wissow L,