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Implementation of an Evidence-Based Screening Tool for Children For Detection of Developmental, Behavioral and Family Issues

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Abstract

Background: Children are a vulnerable population who are at risk for a variety of developmental, behavioral and family concerns. Early intervention leads to improved outcomes. By implementing the comprehensive evidence-based screening tool the Survey of Well-being for Young Children (SWYC), within a Federally Qualified Health Center (FQHC), outcomes for these children may be improved through early intervention.

Methods: The SWYC survey was provided to parents and guardians of children ages zero to five years at one pilot site at a FQHC in New England during well child visits (WCV) over a 6-week period. Implementation success was measured through review of electronic medical record (EMR) reports, tracking referrals, and an anonymous staff satisfaction survey.

Results: Chi-square analysis showed no significant difference between the pre-intervention and post-intervention groups developmental screening rate (p=.099) and referral rate (p=1.00). A significant difference (p=.017) was noted in completion of the M-CHAT between groups. The staff satisfaction survey had an estimated responses rate of 50%. Responses indicated that 40% of staff were satisfied with the SWYC survey, 50% were neutral, and 10% were unsatisfied.

Conclusion: Findings from the QI project indicate that the sample size may have been too small to see a difference between the pre-intervention and post-intervention groups. M-CHAT rates may have been lower during the QI project because the POSI found within the SWYC survey also screens for autism. An emerging theme was that the SWYC had a greater focus on family concerns when compared to the previous tool used in this FQHC. Recommendations for the future include a larger sample size and higher engagement of clinical staff during pilot project planning.

Keywords: *screening, children, development, behavior, primary care*

Implementation of an Evidence-based Screening Tool for Children

Introduction

Children are a vulnerable population who are at risk for a variety of developmental, behavioral, and family concerns. Screening can help to identify these concerns early leading to improved outcomes for the children now and as they grow into adults. Creating a healthier pediatric population means we are creating a healthier population for the future.

Background

One in six children have a developmental disorder, including autism (0.5%) and intellectual disabilities (0.7%), learning disabilities (7.7%), and developmental delays (3.7%) (Boyle et al., 2011). Given the number of children that have developmental disorders the American Academy of Pediatrics and the National Association of Pediatric Nurse Practitioners recommends screening during primary care visits for young children. Identifying these children at a young age can get them the appropriate evidence-based interventions earlier in life which can lead to better long-term outcomes (Fallucco, Blackmore, Bejarano, Wysocki, Kozikowski & Gleason, 2017).

Children that are not treated at a young age are at an increased risk for school failure, are less likely to be employed in adulthood, are at an increased risk to be teen parents, experience higher healthcare costs, and are more likely to participate in criminal activity (Simon, Pastor, Avila, Blumberg, 2013). Another benefit of earlier identification is having services provided at a free or reduced cost, at least 12% of children under the age of three may be eligible for services provided under the Individuals with Disabilities Act (Rosenberg, Zhang, & Robinson, 2008). Children, ages zero to five years, are seen at their pediatric primary care providers (PPCP) office

routinely for well-child visits (WCV). Due to these frequent routine visits, the WCV is an ideal time to screen for potential developmental, behavioral, and family concerns.

Problem Statement

Children ages zero to five years can be at risk for developmental, behavioral issues as well as family concerns. The earlier these concerns are identified the more likely children are to receive the appropriate care needed. Lack of early identification of developmental, behavioral, or family concerns may lead to reduced health and wellness as the child ages. This quality improvement (QI) project will include implementing an evidence-based screening tool for children ages zero to five years in an outpatient pediatric site in New England.

Organization "Gap" Analysis of Project Site

The Federally Qualified Health Center where this QI project was implemented had not routinely used an evidence-based screening tool for developmental, behavioral, and family concerns. The only evidence-based tool being implemented was the Modified Checklist for Autism in Toddlers (M-CHAT) (Robins, Fein, & Barton, 2009). The screening tool currently embedded within the electronic medical record (EMR) is a Blended Denver Developmental tool. However, this tool had not been updated in the EMR making it no longer evidence-based care.

The desired outcome of this project was to incorporate a comprehensive evidence-based screening tool which can be used on children ages zero to five years. The tool piloted was the Survey of Well-being of Young Children (SWYC) (Floating Hospital for Children at Tufts Medical Center, 2019). The SWYC survey is the only available evidence-based screening tool that comprehensively screens for behavioral, developmental and family concerns. A sample of the SWYC survey can be found within Appendix A.

Review of the Literature

Search Process

A review of literature was completed via the Cumulative Index of Nursing Allied Health Literature, MEDLINE, and Cochrane databases. The SWYC website and American Academy of Pediatrics were also utilized. Keywords searched include *developmental, behavioral,* and *family screening tools, children,* and *primary care*. Inclusion criteria narrowed the search to peer reviewed articles, published dates between 2012 and 2019, those in the English language and from the United States of America. The databases search revealed a total of 19 articles; articles were also pulled from the SWYC website for a total of 23. After review, one article was excluded as it focused on teaching psychiatric assessment skills, another ten articles were also excluded because the ages of the screened individuals were out of the range of up to five years old. Articles chosen for this review included evidence-based screening methods for children ages five years and younger for a total of twelve articles.

Synthesis

Of the twelve articles reviewed, four focused on development and testing of reliable and valid screening tools (Studts, Polaha, & Van Zyl, 2017; Sheldrick & Perrin, 2013; Sheldrick, Henson, Neger, Merchant, Murphy & Perrin, 2013; Sheldrick, Henson, Merchant, Neger, Murphy & Perrin, 2012). Three of these tools are from the SWYC survey.

Developmental screening tools. The Baby Pediatric Symptom Checklist (BPSC) and Preschool Pediatric Symptom Checklist (PPSC) were developed by a team of experts who reviewed current assessment tools and related research. Both of these tools showed promise as a social emotional screening tool for PPCP. (Sheldrick et al., 2013; Sheldrick et al., 2012).

The SWYC Milestone items were developed by a team of experts who reviewed current research and existing tools. The SWYC Milestone which screens for developmental concerns, displayed a good fit regardless of race/ethnicity, education level, and child gender with adequate sensitivity and specificity (Sheldrick & Perrin, 2013).

The final article looked at a brief screening tool developed from the Pediatric Symptom Checklist (PSC-17) and Behavior Problems Index (BPI) (Studts et al., 2016). The abbreviated screening tool which consisted of 18 questions was found to have eight items which were undesirable for screening diverse populations of children (Studts et al., 2016). Each article used in this literature review was evaluated using The Johns Hopkins Nursing Evidence-Based Practice Rating Scale (Newhouse, Dearholt, Poe, Pugh, & White, 2005). The four articles described above were all quasi-experimental studies, making the strength of evidence Level II. The quality of evidence was assessed as good.

Parents' Observations of Social Interactions. One article (Level II, good) compared and contrasted an existing evidence-based practice tool with a new abbreviated screening tool (Smith, Sheldrick, & Perrin, 2012). The article was located on the SWYC website and consisted of two studies. In both studies the Modified Checklist for Autism in Toddlers (M-CHAT) and Parents' Observations of Social Interactions (POSI) were compared to assess reliability and validity of the POSI. In one study no statistically, significant differences were noted. In the other the POSI was more sensitive and the specificity was lower. The authors concluded that the POSI had good internal reliability and was comparable in terms of sensitivity/specificity to the M-CHAT. (Smith et al., 2012)

Autism screening. Three articles shared best practices related to screening for autism disorder (Sanchack & Thomas, 2016), screening mothers for post-partum depression and anxiety

disorder (Kurtz, Levine, & Safyer, 2017), and developmental screening approaches in primary care practice (Williams, Cormack, Chike-Harris, Durham, Fowler & Jensen, 2015). To summarize the basic findings Sanchack and Thomas (2016) recommend screening for autism spectrum disorder early in life at the 18-month and 24-month WCVs (Level IV, good). Kurtz et al. (2017), recommend screening parents for post-partum depression and anxiety at WCVs (Level IV, good). By diagnosing these disorders early this can decrease the long-term impacts of parental depression and anxiety on their children (Kurtz et al., 2017). Williams et al. (2015) concludes that early recognition of developmental delays is necessary in pediatric primary care (Level IV, good). Various screening tools are shared including the Ages and Stages Questionair-3, the Parents' Evaluation of Developmental Status (PEDS), and the M-CHAT-Revised (Williams et al., 2015).

Policy. One cross sectional design study (Level I, high) looked at impacts of policy change in behavioral screening with primary care practices (Savageau, Keller, Willis, Muhr, Aweh, Simons, & Sherwood, 2016). They found that a Massachusetts Medicaid policy change, the Children's Behavioral Health Initiative, which reimbursed behavioral health screening with standardized tools resulted in wide spread behavior health screening in Massachusetts primary care practices for children with Medicaid (Savageau et al., 2016).

Family screening. Well child visits are not only an opportunity to screen children but can also be valuable opportunity to screen parents. Parents, in particular mothers, may spend more time focusing on their children's health rather than their own. Well child visits are an opportunity to screen for potential mental health concerns like post-partum depression. One systematic review (level IV, good) looked at post-partum depression screening in pediatric practice. They found that post-partum depression can be managed within pediatric primary care

and that these are needed to implement timely and non-stigmatized care (Olin, Kerker, Stein, Weiss, Whitmyre, Hoagwood, & Horwitz, 2016).

Implementation of screening tools. There were also two primary research studies. One looked at data from a screening tool website to help inform clinicians embarking on evidence-based screening tools and to describe various strategies used by practices (Glascoe, 2015). Glascoe (2015) found that online screening tools were used in a variety of ways to provide screening services (level II, good). The next study (level II, good) looked at implementing Early Childhood Screening Assessment (ECSA) within a primary care practice (Fallucco et al., 2017). They found that 70% of clinicians were using the ECSA and of these 89% agreed that it helped detect more cases of behavioral and emotional problems than history taking alone (Fallucco et al., 2017).

Themes. The literature revealed that there are various screening tools available for young children. A common theme is that these tools can be used to improve the life of children and their parents. The SWYC screening tool was chosen as it is comprehensive and encompasses behavior, developmental, and family concerns (including screening for depression in parents).

Evaluation of screening tools. Other developmental screening tools evaluated, in addition to the SWYC survey, included the Ages and Stages Questionnaire, Communication and Symbolic Behavior Scales - Developmental Profile, Parents' Evaluation of Developmental Status, Parents' Evaluation of Developmental Status - Developmental Milestones. The below table was modified from the Star Center Screening Technical Assistance & Resource Center in collaboration with the American Academy of Pediatrics (2017). This table outlines the current evidence-based developmental screening tools for children ages zero to five.

Table 1

Child Developmental Screening Tool Comparison

Title of Screening Tool	Category	Topics Covered	Number of Items	Parent Completion Time (in Minutes)	Cost
Ages and Stages Questionnaire (ASQ-3)	Development	Behavior, Language Development, Motor, Problem Solving	30	10 to 15	$225
Communication and Symbolic Behavior Scales - Developmental Profile	Development	Language Development	24	15 to 20	$399
Parents' Evaluation of Developmental Status (PEDS)	Development	Behavior, Language Development, Motor, Problem Solving, Social-emotional Development	10	2	$299
Parents' Evaluation of Developmental Status - Developmental Milestones (PEDS-DM)	Development	Behavior, Language Development, Motor, Problem Solving, Social-emotional Development	6 to 8	5	$299
Survey of Well-being of Young Children	Development, Autism, Social-emotional Development, Maternal Depression, Social Determiants of Health	Autism, Family Stress, Language Development, Maternal Depression, Motor, Social-emotional Development	10 to 17	5 to 10	$0

Evidence Based Practice: Verification of Chosen Option

The SWYC survey was implemented in a Federally Qualified Health Center (FQHC) for this QI project. This survey is the only identified comprehensive survey for children up to five years of age and screens for developmental, behavioral and family concerns. The practice

elected to continue using the M-CHAT to screen for autism and also used the Parent Observations of Social Interactions from the SWYC survey.

Theoretical Framework or Evidence Based Practice Model

The nursing theory used to guide this project is the Science of Unitary Human Beings by Martha E. Rogers (1990). The mission of this theory is "the translation of nursing knowledge into human service" (Fawcett, 2014, p.10). The most recent concepts in this conceptual system are energy field, openness, pattern, and pandimensional with the homeodynamics being helicy, resonancy, and integrality (Fawcett, 2014). Finally, this theory visualizes the nursing process as three steps: assessment, voluntary mutual patterning, and evaluation (Fawcett, 2014; Petiprin, 2016).

The Science of Unitary Human Being's applied research includes research of already available knowledge in practice situations (Fawcett, 2014). This aligned with implementing an already developed evidence-based screening tool like the SWYC survey. The primary purpose for practice is promoting the well-being for all human beings, wherever they are (Fawsett, 2014). The SWYC survey not only assesses the child but also the family and environment, meeting them where they are.

The SWYC survey also recognizes the importance of comprehensive screening by looking at multiple elements which might impact life including, behavior, social, and environmental impacts. This connects with Rogers (1990) theory to serve the entire person with safe practice. Rogers (1990) also felt that the scientific nursing knowledge the nurse can bring to practice is important. A diagram of this conceptual framework can be found within Appendix B.

Goals, Objectives and Expected Outcomes

The overarching goal for this project was to increase screening and detection of developmental, behavioral and family related problems in order to promote early intervention and prevention of longer-term sequelae. To that end, the main expected outcome for this QI project was successful implementation of an evidence-based screening tool for children ages zero to five.

The specific objectives of this QI project included:

1. 100% of children ages 0-5 will be screened using the SWYC survey when coming in for a WCV at the completion of the six-week pilot. From October 21, 2018 to December 31, 2018, 49 children ages 0-5 were seen for a WCV.
2. The number of referrals for children ages 0-5 to a specialist for developmental, behavioral, or family concerns will increase during the six-week pilot as compared to the same six-weeks from the previous year (October 21, 2019-November 1, 2019 compared to October 21, 2018-November 1, 2018).
3. At least 90% of staff will self-report that they are satisfied or extremely satisfied with the workflow process for implementing SWYC after six-weeks.

Project Design

This quality improvement project was projected to lead to successful implementation of an evidence-based screening tool for children five years and younger within a primary care practice. This project began with educating the FQHC staff on the survey tool SWYC. During the month of October staff were educated during a department meeting, one-on-one interactions, and via email. Staff included in the education were one Site Director, seven Patient Service Representatives, five nurses (RNs), six medical assistants, and eight providers (3 Medical

Doctors [MDs], 3 Advanced Practice Registered Nurses [APRNs], and 1 Physician Assistants [PAs]). The DNP student was available at least two days a week on site for additional follow-up training and to answer questions as needed. See Appendix C for a training outline.

Project Site and Population

This Quality Improvement Project was conducted at a Federally Qualified Health Center (FQHC) in New England. They have three separate facilities within one state. As of April 3, 2019, the total number of active pediatric patients ages zero to five at all three FQHC sites was 1,617. The pilot site, has a total of 296 pediatric patients ages zero to five years. Of the 296 pediatric patients, 134 are female and 162 are male. The primary race is white at 231, nine are Asian, four African American, three Multiple Race, one American Indian or Alaska Native, and 48 unspecified.

The primary ethnicity is non-Hispanic at 222, no ethnicity specified in 57, and 17 identify as Hispanic. There are no homeless patients at this time. Insurances include insured, uninsured, sliding fee scale (SFS), and state/federally funded insurances. Of the 296 pediatric patients, 94 have private insurance, 41 are on the SFS, 154 are covered by state or federally funded insurances, and 7 have no insurance noted.

This site has a total of ten health care providers (MDs, APRNs, PAs), of which seven see pediatric patients. There are six nurses (RNs and LPNs), ten medical assistants, and eight patient service representatives.

Setting facilitators and barriers. Facilitating factors for this project were a motivated QI team at the FQHC and a motivated Pediatric Primary Care Provider. The screening tool was already available within the EMR which supported ready access. Parents were provided with the appropriate SWYC form to complete prior to seeing the medical provider and completion time

for the survey was estimated to be between 5-10 minutes and the scoring of the survey will be automated via the EMR. A permission letter was received by this facility to complete this project.

Barriers may have included staff resistance to change in workflow including the time pressures associated with completing the SWYC survey. There was also additional time spent by the MA or nurse to enter the results into the EMR. Another barrier was ensuring the SWYC information is entered it into the computer before the patient is seen by the medical provider. Another phenomenon that might have impacted implementation is click fatigue, since there are so many items to check off within the EMR this survey added to the already numerous boxes which must be checked.

Methods

On October 15, 2019 the staff at the FQHC were educated on the SWYC survey and the recommended workflow (refer to Appendix D) for this quality improvement pilot. The training took place during a weekly meeting with the nurses, medical assistants, and patient service representatives. Education was completed by the DNP student. The staff was provided with the SWYC manual and training materials from the SWYC website. An email was sent to all the FQHC providers with a summary of the planned pilot project, the SWYC manual, and the SWYC website resources. Then the DNP student followed-up with each of the FQHC providers to conduct a brief training and answer any questions.

The pilot began on October 21, 2019 and ran for six weeks. During this time the patient service representative or medical assistant/nurse handed the parents the SWYC survey to complete. Parents completed the survey and handed it to the individual rooming the patient (medical assistant or nurse). The medical assistant or nurse rooming the patient then entered the

SWYC survey data into the patient's chart within the EMR prior to the provider entering the room to see the patient.

Measurement Instruments

Once the six weeks was over the QI team and DNP student used specific measurements to see if the pilot was effective. In order to measure the outcomes of this DNP project, the QI nurse ran reports from the EMR weekly during the 6-week pilot. At the end of the 6-week pilot a comprehensive report was run which measured how often the SWYC survey was completed for children coming in for a WCV and the number of referrals to behavioral or developmental specialists for children ages zero to five. This data was then compared by the DNP student to a retrospective report measuring the same data from 12 months prior. This ensured that no differences are due to the time of year the pilot study occurred. The EMR reports allowed us to look at individual provider results, teams, and the entire practice site to help identify areas that might need improvement.

During the six-weeks of implementation the DNP student was available onsite (at least 2 days a week), via phone and via email for any questions related to the pilot. Additional support was provided through the DNP student's preceptor, the QI nurse. Files were created for the patient service representative and each of the teams (nurses and medical assistants). These files held printed copies of the SWYC survey and copies of the workflow as a quick reference.

Another measurement was an anonymous *Staff Satisfaction Survey* to assess satisfaction with the SWYC implementation workflow which was administered at the end of the pilot. The brief *Staff Satisfaction Survey* consisted of questions about the providers' perception of the

screening tool's usefulness, the survey length, the workflow's success, and suggestions for workflow improvement (Appendix E).

Data Collection Procedures

Data was collected by the QI Nurse and DNP student through EMR reports and the *Staff Satisfaction Survey*. EMR reports we de-identified and included no patient identifiers. EMR reports included the patient's age in months, time of visit, type of visit, if SWYC was completed, if referral was done, primary language spoken, race, ethnicity, homeless status, if M-CHAT was completed, type of provider, and provider name. The main goal was to measure usage of the SWYC survey and referrals, to see how often the survey was done correctly and referrals were completed.

The follow-up *Staff Satisfaction Survey* was distributed to providers and staff after the pilot was completed. This was an anonymous electronic survey, using Qualtrics, sent out via email. Results were collected through a report run in Qualtrics and analyzed for trends and themes.

Data Analysis

Data collection procedures included pre-intervention and post-intervention EMR reports that were compared and contrasted through a cross tabulation with Chi-Square statistical analysis using SPSS. Chi-square tests are used to determine if a significant difference exists between two groups. The *Staff Satisfaction Survey* was used as part of the PDSA cycle for the practice. The data from the *Staff Satisfaction Survey* was analyzed for themes and summarized for the practice to use as a tool for potential changes when implementing this screening tool at all three sites.

Results

EMR Reports

A total of 49 patients (n=49) ages 0-5 had a WCV during the pre-intervention stage and 61 patients (n=61) during the post-intervention stage had a WCV. Table 1 below presents a characteristic summary of the pre- and post- intervention groups. These two groups were comparable and no statistically significant difference was noted between the pre-intervention and post-intervention group. Characteristics examined included provider type, race, ethnicity, preferred language, gender, and homelessness. Homelessness is not included within the table because no patients during either of these timeframes reported being homeless.

Table # 1

Characteristics Pre- and Post-Intervention Population

Characteristics	Pre-Intervention (n=49)		Post Intervention (n=61)		Significance Based on Chi-Square
	N	%	N	%	p-value
Providers					.667
MD	22	44.9%	25	41%	
APRN	25	51.0%	35	57.4%	
PA	1	2.0%	1	1.6%	
Missing	1	2.0%	0	0%	
Patient Race					.180
White	40	81.6%	49	80.3%	
Black	3	6.1%	2	3.3%	
Asian	3	6.1%	1	1.6%	
Multi-race	1	2.0%	2	3.3%	
American	2	4.1%	7	11.5%	
Indian/Alaska Native					
Ethnicity					.640
Non-Hispanic	39	79.6%	44	72.1%	
Hispanic	3	6.1%	6	9.8%	
Missing	7	14.3%	11	18%	
Patient Preferred					.262
Language	43	87.8%	51	83.6%	
English	1	2.0%	0	0%	
Spanish	1	2.0%	0	0%	
Arabic	4	8.2%	10	16.4%	

Missing					
Patient Gender					.701
Male	26	53.1%	29	47.5%	
Female	23	46.9%	32	52.5%	

*Age in months not included in above table. This chi-square was also non-significant at p=.267

A Chi-Square and crosstabulations was run to determine if any significant difference existed between the pre-intervention and post-intervention groups developmental screenings numbers. Table 2 shows us that there was no significant difference between the pre-intervention and post-intervention group in their completed developmental screenings (*p*=.099). It is also important to note that 75.4% of the post-intervention group had a developmental screening completed.

Table # 2

Result of Chi-Square Test Pre- and Post- Intervention Developmental Screening

	Developmental Screening Completed	
	Yes	No
Pre-Intervention	29 (59.2%%)	20 (40.8%)
Post-Intervention	46 (75.4%%)	15 (24.6%)

Note. X^2=3.298, df=1, p=.099.

A variety of Chi-Square and cross tabulation analyses were run to see if any differences existed in the referrals of patients from the pre-intervention group and the post-intervention group. Table 3 shows the results of the Chi-Square and crosstabulation for all referrals, no statistical significance was found (*p*=1.00). The other Chi-Square and crosstabulations completed for referrals indicated no statistically significant difference between the pre-intervention and post intervention groups: mental health referrals (p=.322), pediatric nurse specialist referrals (p=.458), and Physical Therapy or Occupational Therapy referrals (p=.404).

Table # 3

Result of Chi-Square Test Pre- and Post- Intervention Referral

	Referral Ordered	
	Yes	No
Pre-Intervention	8 (16.3%)	41 (83.7%)
Post-Intervention	9 (14.8%)	52 (85.2%)

Note. X^2=.051, df=1, p=1.00.

In addition to comparing the pre-intervention and post-intervention groups developmental screening, a comparison was also done to see if there was a difference in the use of M-CHAT (an autism screening tool used for patients 16-30 months of age). Table 4 shows there was a statically significant difference noted between the pre-intervention and post-intervention group (p=.017). Pre-intervention group had a 36.7% completion rate compared the post-intervention group at 16.4%. To follow-up on this result an additional Chi-Square analysis was completed to see if there was any difference between the pre-intervention and post-intervention group related to the age for M-CHAT. Patients were identified as falling into the age group of 16-30 months or outside of this age group. There was no statistical significance found between patients in this ae range pre and post-intervention (*p*=.815).

Table # 4

Result of Chi-Square Test Pre- and Post- Intervention M-CHAT

	M-CHAT Completed	
	Yes	No
Pre-Intervention	18 (36.7%)	31 (63.2%)
Post-Intervention	10 (16.4%)	51 (83.6%)

Note. X^2=5.925, df=1, p=.017.

Staff Satisfaction Survey

There was a total of 10 responses to the anonymous staff satisfaction survey. While there are potentially 31 staff involved in this pilot, some staff were not involved in this process. The DNP student estimates that the number of staff involved in this pilot was closer to 20 indicating

an approximate 50% response rate. Table 5 provides a summary of the results from the anonymous staff satisfaction survey.

Table # 5

Summary of Staff Satisfaction Survey

Question	Response	% Total (N=10)
During the 6 week SWYC Pilot Project, were the results of the SWYC survey available for the provider (MD, DO, APRN, PA) at the time of the patient's well child visit?	• 3, all the time • 2, most of the time • 2, neutral • 2, some of the time • 1. Never	30% 20% 20% 20% 10%
The following question is for providers (MD, DO, APRN, or PA). During the 6 week SWYC Pilot Project did you feel the screening results were credible? Please explain.	• 4, yes • 1, no • 5, not applicable Explanation narratives: "It wasn't that I didn't find it was credible but I did not find it as useful and much more time consuming, often not relevant" "I did not see it once" "Didn't do any WCV (Well child visits)" Six responses entered as, "not applicable"	40% 10% 50%
How satisfied were you with the work-flow used during the 6 week SWYC Pilot Project?	• 2, very satisfied • 2, satisfied • 5, neutral • 1, unsatisfied	20% 20% 50% 10%
During the 6 week SWYC Pilot did you follow the work-flow shared during the training?	• 5, yes • 5, no	50% 50%
If you answered YES to the previous question, please share what made this work flow successful and what could be improved. If you answered NO to the previous question, please share	Narrative Responses: "Not sure"	

what work flow you used, what made this workflow successful, and what could be improved.	"Was not present for training so I'm unsure" "Again, I did not see it once, sounded great" "I would enter the answers into the chart once I was out of the room and as the provider was going in. This helped because I had to pull the form in and enter it, doing it this way. I was not in the exam room too long." "Worked well" "Inputting the results into the EMR is very time consuming and sometimes providers forget to return the forms to MA/nurse to input." "Having the parent fill out the form before the actual visit was extremely helpful" "Some of the MAs provided questionnaire, some did not. Not always given to provider prior to seeing patient" "I did not attend the training and the "workflow" seems to be led by front desk and/or MA's"	
What changes did you see in identification of family, behavioral, and/or developmental concerns when using the SWYC tool vs the Blended Denver Developmental Tool?	Narrative Response: "More parent focused" "Did not see it" It let us know in writing if they met the age appropriate guidelines or if they needed further assessment" "Brought more awareness to psychosocial needs"	Family focused: 30%

	"Greater insight into FAMILY struggles" "Great info available on family functioning and parent perspective" 4 responses "Not applicable"	
Do you have any concerns about implementing the SWYC survey at all three sites within the FQHC?	• 4, yes • 6, no	40% 60%
If you answered YES to the previous question, please explain your concerns about implementing the SWYC survey at all three sites within the FQHC.	Narrative responses: "I think in order for it to be helpful the survey would need to either be abbreviated or custom fit to different visits." "Length of time to collect/add to computer" "Improve training, get survey out earlier due to length" "I think it misses some developmental concerns; providers should also focus on clinical observation" 6, "Not Applicable"	

Discussion

The findings from the pre-intervention and post-intervention groups are mostly not significant. While there was an increase from a 59.2% developmental screening completion to 75.4%, this was not statistically significant at p=.099, which could have been impacted by the small sample size. The goal of 100% completion rate was not reached. This may indicate that this FQHC already had a good process in place to ensure that childhood developmental screenings are not missed. However, there is still room for improvement given the that 24.6% of patients seen for a WCV between the ages of 0-5 were not screened.

Referral comparisons were also insignificant. The expected outcome was that post-intervention referrals would be higher than pre-intervention referrals. However, the pre-intervention referrals were 16.3% and the post-intervention referrals were 14.8%. This difference was not significant at p=1.00. This could indicate that the interpretation of the pre-intervention developmental screening tool is similar to the SWYC. This results also aligns with the goal of researchers who developed SWYC, not as a diagnosis or need to refer tool but as a tool for information and help guide clinical judgements (Perrin, Sheldrick, Visco & Mattern, 2016).

The one significant finding was that the M-CHAT was completed more often in the pre-intervention group (36.7%) than the post-intervention group (16.4%) with p= .017. This finding may indicate that more education was needed on the importance of completing the M-CHAT in addition to the POSI found in the SWYC survey. While the SWYC survey does have this component to screen for autism which has shown good internal reliability and similar specificity/sensitivity to the M-CHAT in two independent groups (Smith et al., 2012), the FQHC has elected to keep completing the M-CHAT during this quality improvement project.

The goal for the staff satisfaction survey was a 90% response rate. The estimate is that about 50% of those involved in the QI project completed the anonymous staff satisfaction survey. These results indicate that about 50% of the time, the SWYC survey results were available to the provider prior to seeing the patient for a WCV. This indicates that may providers were unable to use these screening results as a clinical tool during the WCV. The feeling of credibility of the screening results was also accessed. Results from the survey indicate that 80% (n=4) of providers who completed the survey said yes and 20% (n=1) said no. It appears that the

individuals who answered no gave the explanation, “It wasn’t that I didn’t find it was credible but I did not find it as useful and much more time consuming, often not relevant.”

In addition to measuring satisfaction of the tool itself, the satisfaction with the work-flow was also examined. The survey indicates that 40% of respondents were satisfied, 50% answered neutral and 10% were unsatisfied. Per staff report only 50% of staff followed the work-flow outlined for this QI project. There was a variety of feedback (which can be found in Table 5) indicating why this work-flow worked well and what could be improved. Some key takeaways is that the SWYC screening tool is time consuming and having the parent/guardian fill out the form prior to entering the room is helpful. While the SWYC survey was created to be short, easy, and simple to answer (Perrin et al., 2016) the feeling of not having enough time to complete visits in Primary Care Practice is common (McDonald, Rodriguez & Shortell, 2018). Examination of this barrier is outside of the scope of this QI project.

Another important part of this survey was the changes from using the Blended Denver Developmental Tool to the SWYC screening tool. A theme which emerged was the greater focus on family, including responses such as “more parent focused”, “greater insight into family struggles”, and “great info available on family functioning and parent perspective.” Pediatric primary care can be a great place to screen families especially parents for post-partum depression (Serene Olin et al., 2016; Kurtz et al., 2017) which are addressed in questions six and seven on the SWYC family questions. Additional family screenings on the SWYC include tobacco use, substance use disorders, food insecurity, and domestic violence (Perrin et al., 2016).

The final question on the survey asked about concerns with implementing SWYC across all three FQHCs. A majority of the participants had no concern (60%). However, that leaves 40% who did have concerns. The main theme in these concerns seemed to be the time it takes to

complete the SWYC survey. One individual also indicated that this screening tool may miss developmental concerns and providers need to focus on clinical observation.

Cost-Benefit Analysis/Budget

The costs for this health care quality improvement project included data collection, education of staff on new workflow, and implementation of a new surveying tool. There was no capital investment costs as the systems needed were already in place. These included an electronic medical record (EMR), email, and conference rooms. It is important to note that any costs associated with the project were absorbed by the FQHC and/or DNP student. A list of potential costs are outlined below.

- Data collection of referrals and implementation of survey. This includes running surveys pre- and post-intervention and collecting survey data from staff on work-flow process.
- Education on the screening tool, follow-up, and resources.
- Implementation of the SWYC survey.
    - SWYC survey is a free tool which was already embedded in the FQHC's EMR

Estimated Cost-Savings

Screening which may lead to earlier interventions may have a cost savings for individual patients and their families. This also has the potential to lead to reduced government spending for these children. Research suggests that government funds invested early in the lives of children result in decreased government expenditures. Therefore, by providing screening and identifying concerns early in life we may decrease the cost of caring for these children as adults. Please see Appendix F for a figure which reflects on potential cost versus savings to government (i.e. taxpayers). (RAND, n.d.)

Benefit and Value

Although there is limited available literature related to the benefit and value of the SWYC survey, primary prevention interventions aimed at early detection such as this have been shown to reduce costs within the health care system. Researchers claim that early interventions targeted at children benefit children and their families. The programs examined lead to gains in emotional or cognitive development, improved parent-child relationships, increased economic self-sufficiency, reduced criminal activity, and improvements in health indicators. (RAND, n.d.)

Ethical Considerations/Projective of Human Subjects

The University of Massachusetts, Amherst (UMass) Internal Review Board (IRB) approval was obtained prior to initiating the DNP Project. All participants were protected by the Health Insurance Portability and Accountability Act of 1996 (HIPAA) which guarantees the privacy of patients' health information (Department of Health and Human Services, 2013). The DNP student and practice personnel who will conduct this project will follow the standards of care for the FQHC. The information will be collected as aggregated data and will not include any potential patient identifiers.

There are specific ethical considerations that this project will address in connection with the American Nurses Association Code of Ethics with Interpretive Statements (2015). These include:

Provision 3.1: Protection of the Rights of Privacy and Confidentiality

Provision 3.4: Professional Responsibility in Promoting a Culture of Safety

Provision 5.5: Maintenance of Competence and Continuation of Professional Growth

Provision 7.2: Contributions through Developing, Maintaining, and Implementing Professional Practice Standards.

This QI project did not involve unnecessary intrusion into a person's life and privacy will be upheld through no access to patient identifiers. By implanting the SWYC survey within this FQHC we are promoting a culture of safety through early intervention. Nurses are self-regulating and must strive to promote oneself and the betterment of the populations they serve through striving for excellence. This excellence is achieved through continuous quality improvement. The accepted standards are that nurses will use evidence-based tools to assure quality of care. The SWYC survey is an evidence-based tool that will be replacing an outdated tool.

Limitations and Future Recommendations

Study sample size. The sample size for this project may have been too small to see a significant effect on developmental screening numbers. Two ways to increase the sample size could have been expanding the QI project to more than one site or increasing the length of the QI project beyond 6 weeks.

QI projects support from clinical staff. One of the perceived benefits to implementing this QI project was a motivated QI team and pediatric primary care provider. Prior to implementation of the project the pediatric primary care provider retired and begin working limited hours. The management of the QI team also changed as the QI nurse manager began working at another practice as an APRN. This left fewer individuals on in the clinical setting who were familiar with the DNP student implementing the project and advocates for the use of SWYC. It may have been beneficial for the DNP students to have developed more networking with clinical staff on the front lines prior to implementation.

Conclusion

Young children are at risk for a variety of developmental, behavioral, and family concerns. Screening can be used as a valuable tool to identify these concerns early on leading to

early intervention. This early intervention had been shown to lead to improved outcomes. The SWYC screening tool is an evidence-based method which comprehensively screens children and their families for a variety of concerns. The FQHC where this QI project occurred serves may low-income families and implementation of the SWYC survey may have helped to identify problems early on among these families who may already be facing many challenges.

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Appendix A

Survey of Well Being for Young Children (SWYC)

SWYC™: 18 months

18 months, 0 days to 22 months, 31 days
V1.07, 4/1/17

Child's Name:
Birth Date:
Today's Date:

DEVELOPMENTAL MILESTONES

These questions are about your child's development. Please tell us how much your child is doing each of these things. If your child doesn't do something any more, choose the answer that describes how much he or she used to do it. Please be sure to answer ALL the questions.

	Not Yet	Somewhat	Very Much
Runs	0	1	2
Walks up stairs with help	0	1	2
Kicks a ball	0	1	2
Names at least 5 familiar objects - like ball or milk	0	1	2
Names at least 5 body parts - like nose, hand, or tummy	0	1	2
Climbs up a ladder at a playground	0	1	2
Uses words like "me" or "mine"	0	1	2
Jumps off the ground with two feet	0	1	2
Puts 2 or more words together - like "more water" or "go outside"	0	1	2
Uses words to ask for help	0	1	2

PRESCHOOL PEDIATRIC SYMPTOM CHECKLIST (PPSC)

These questions are about your child's behavior. Think about what you would expect of other children the same age, and tell us how much each statement applies to your child.

		Not at all	Somewhat	Very Much
Does your child...	Seem nervous or afraid?	0	1	2
	Seem sad or unhappy?	0	1	2
	Get upset if things are not done in a certain way?	0	1	2
	Have a hard time with change?	0	1	2
	Have trouble playing with other children?	0	1	2
	Break things on purpose?	0	1	2
	Fight with other children?	0	1	2
	Have trouble paying attention?	0	1	2
	Have a hard time calming down?	0	1	2
	Have trouble staying with one activity?	0	1	2
Is your child...	Aggressive?	0	1	2
	Fidgety or unable to sit still?	0	1	2
	Angry?	0	1	2
Is it hard to...	Take your child out in public?	0	1	2
	Comfort your child?	0	1	2
	Know what your child needs?	0	1	2
	Keep your child on a schedule or routine?	0	1	2
	Get your child to obey you?	0	1	2

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Floating Hospital for Children at Tufts Medical Center

********** **Please continue on the back** **********

PARENT'S OBSERVATIONS OF SOCIAL INTERACTIONS (POSI)

	Many times a day	A few times a day	A few times a week	Less than once a week	Never
Does your child bring things to you to show them to you?	○	○	○	○	○

	Always	Usually	Sometimes	Rarely	Never
Is your child interested in playing with other children?	○	○	○	○	○
When you say a word or wave your hand, will your child try to copy you?	○	○	○	○	○
Does your child look at you when you call his or her name?	○	○	○	○	○
Does your child look if you point to something across the room?	○	○	○	○	○

	Says a word for what he or she wants	Points to it with one finger	Reaches for it	Pulls me over or puts my hand on it	Grunts, cries or screams
How does your child usually show you something he or she wants?					
(please check all that apply)	☐	☐	☐	☐	☐

	Playing with dolls or stuffed animals	Reading books with you	Climbing, running and being active	Lining up toys or other things	Watching things go round and round like fans or wheels
What are your child's favorite play activities?					
(please check all that apply)	☐	☐	☐	☐	☐

For acknowledgments, validation, and other information concerning the POSI, please see www.theswyc.org/posi

PARENT'S CONCERNS

	Not At All	Somewhat	Very Much
Do you have any concerns about your child's learning or development?	○	○	○
Do you have any concerns about your child's behavior?	○	○	○

FAMILY QUESTIONS

Because family members can have a big impact on your child's development, please answer a few questions about your family below:

	Yes	No
1 Does anyone who lives with your child smoke tobacco?	Ⓨ	Ⓝ
2 In the last year, have you ever drunk alcohol or used drugs more than you meant to?	Ⓨ	Ⓝ
3 Have you felt you wanted or needed to cut down on your drinking or drug use in the last year?	Ⓨ	Ⓝ
4 Has a family member's drinking or drug use ever had a bad effect on your child?	Ⓨ	Ⓝ

	Never true	Sometimes true	Often true
5 Within the past 12 months, we worried whether our food would run out before we got money to buy more.	○	○	○

Over the past two weeks, how often have you been bothered by any of the following problems?	Not at all	Several days	More than half the days	Nearly every day
6 Having little interest or pleasure in doing things?	⓪	①	②	③
7 Feeling down, depressed, or hopeless?	⓪	①	②	③

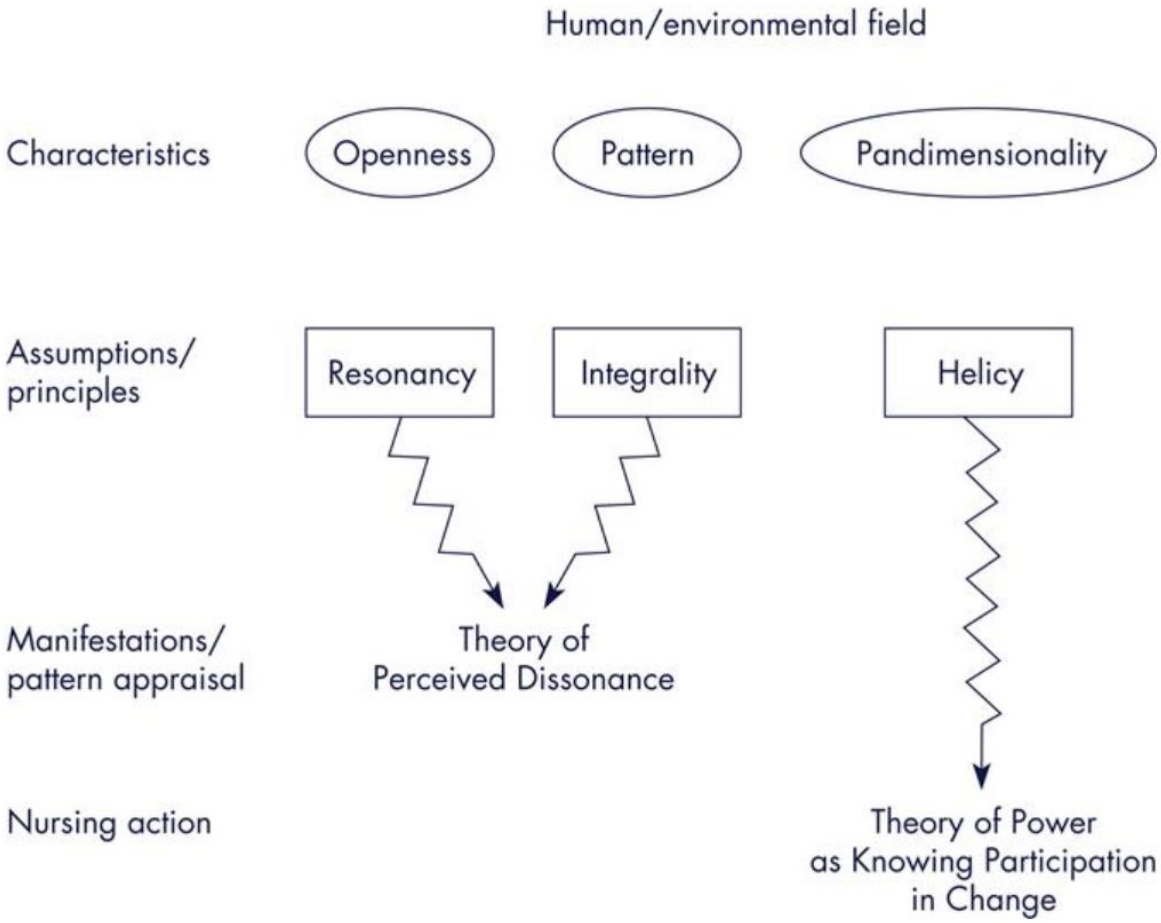
	No tension	Some tension	A lot of tension	Not applicable
8 In general, how would you describe your relationship with your spouse/partner?	○	○	○	○

	No difficulty	Some difficulty	Great difficulty	Not applicable
9 Do you and your partner work out arguments with:	○	○	○	○

10 During the past week, how many days did you or other family members read to your child?	⓪	①	②	③	④	⑤	⑥	⑦

Appendix B

Science of Unitary Human Beings (Bultemeier, 2017)



Appendix C

Training Outline

The Survey of Well-being of Young Children

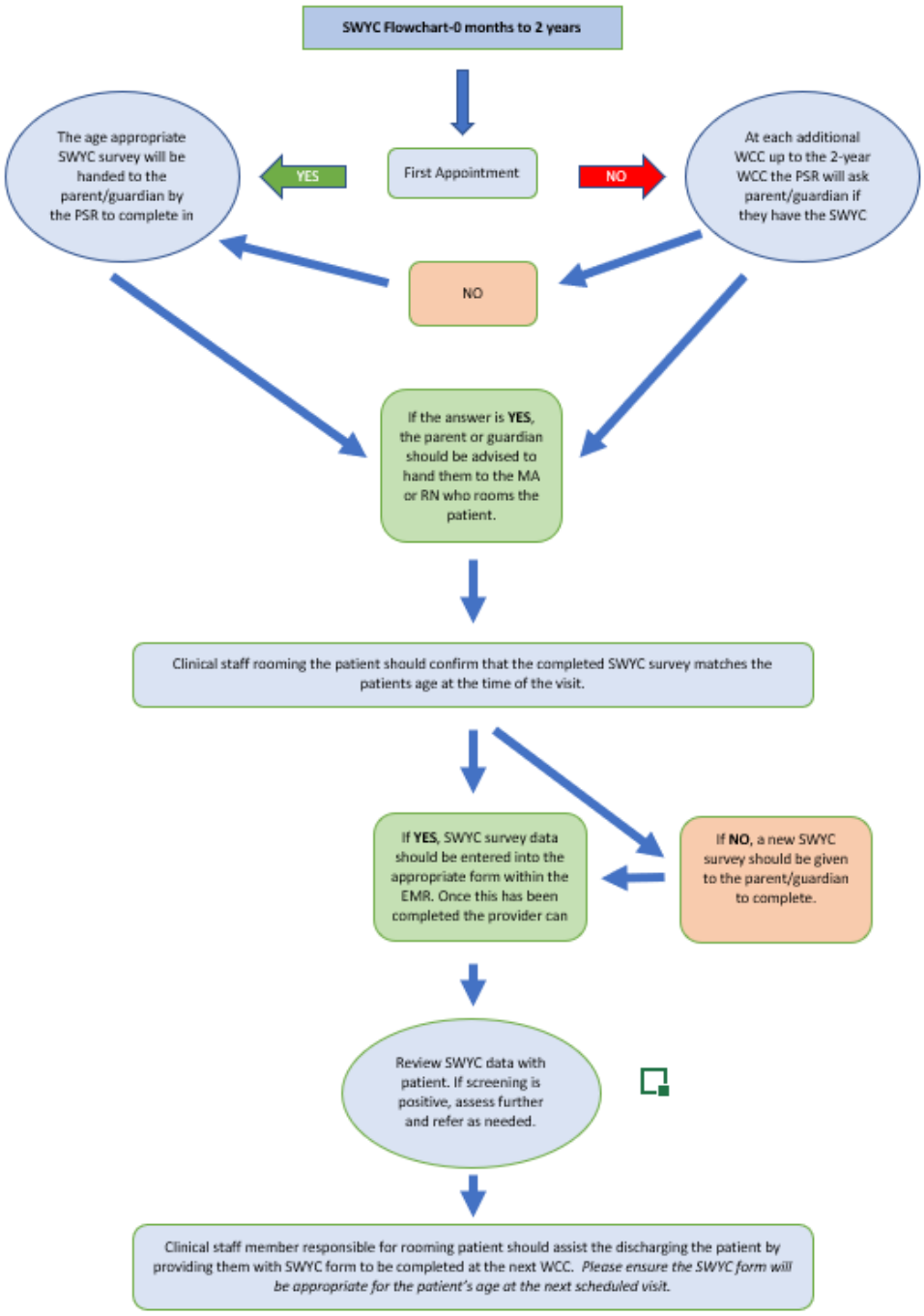
Training Outline

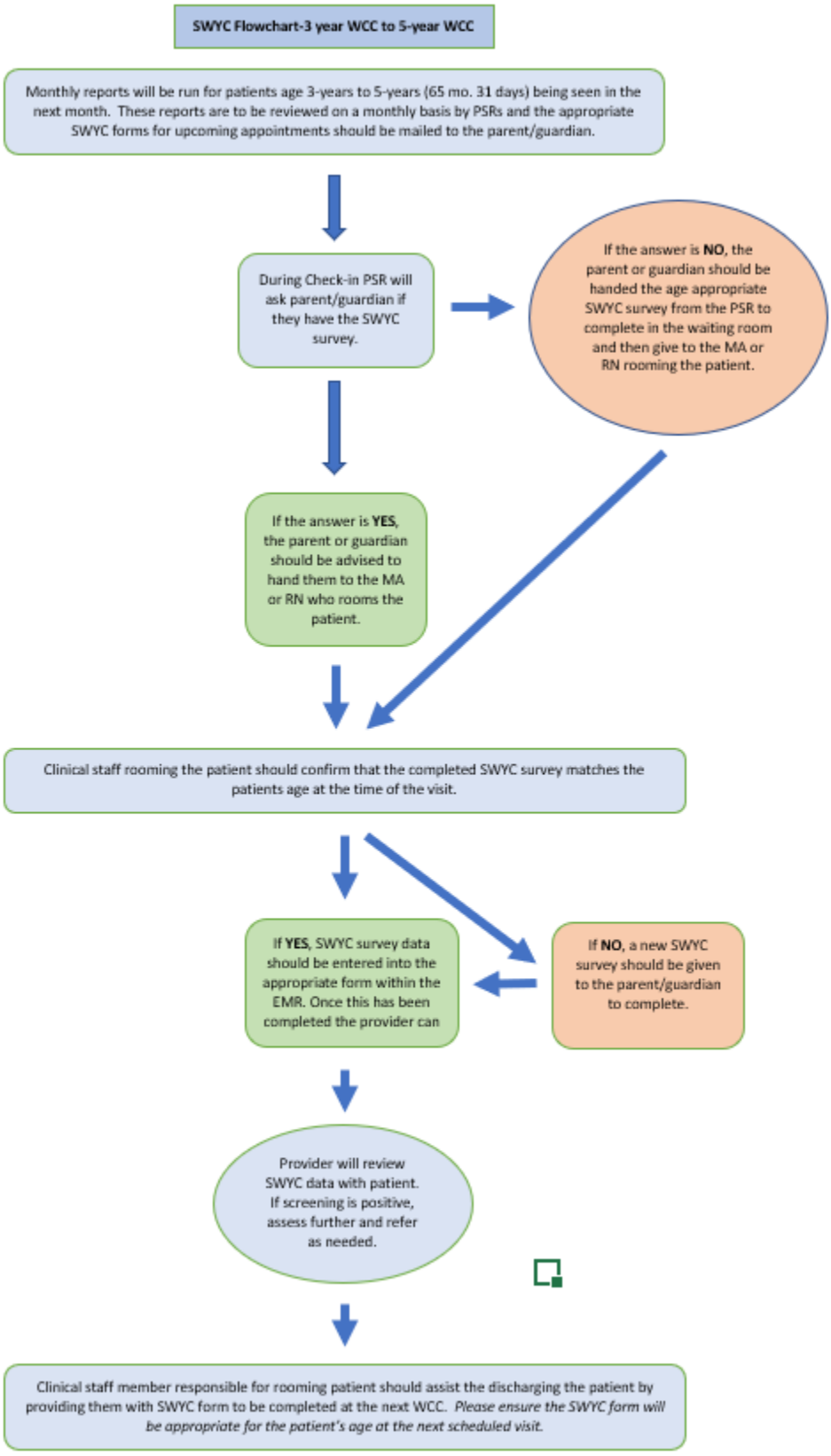
Purpose: This document serves as a guide for training staff at FQHC who will be involved in implementing the Survey of Well-being of Young Children (SWYC Survey).

1. General Overview of the SWYC Survey
    a. What is the SWYC Survey?
    b. How will it benefit our patients and practice?
    c. Design of the Survey
2. Roles of Staff
    a. Responsibilities
3. Implementation
    a. Work-Flow
    b. Administration
4. Interpretation
    a. Scoring
5. Post-Screening Actions
    a. Follow-up and Referral

Appendix D

Workflows




SWYC Flowchart-3 year WCC to 5-year WCC
Monthly reports will be run for patients age 3-years to 5-years (65 mo. 31 days) being seen in the next month. These reports are to be reviewed on a monthly basis by PSRs and the appropriate SWYC forms for upcoming appointments should be mailed to the parent/guardian.
During Check-in PSR will ask parent/guardian if they have the SWYC survey.
If the answer is NO, the parent or guardian should be handed the age appropriate SWYC survey from the PSR to complete in the waiting room and then give to the MA or RN rooming the patient.
If the answer is YES, the parent or guardian should be advised to hand them to the MA or RN who rooms the patient.
Clinical staff rooming the patient should confirm that the completed SWYC survey matches the patients age at the time of the visit.
If YES, SWYC survey data should be entered into the appropriate form within the EMR. Once this has been completed the provider can
If NO, a new SWYC survey should be given to the parent/guardian to complete.
Provider will review SWYC data with patient. If screening is positive, assess further and refer as needed.
Clinical staff member responsible for rooming patient should assist the discharging the patient by providing them with SWYC form to be completed at the next WCC. Please ensure the SWYC form will be appropriate for the patient's age at the next scheduled visit.

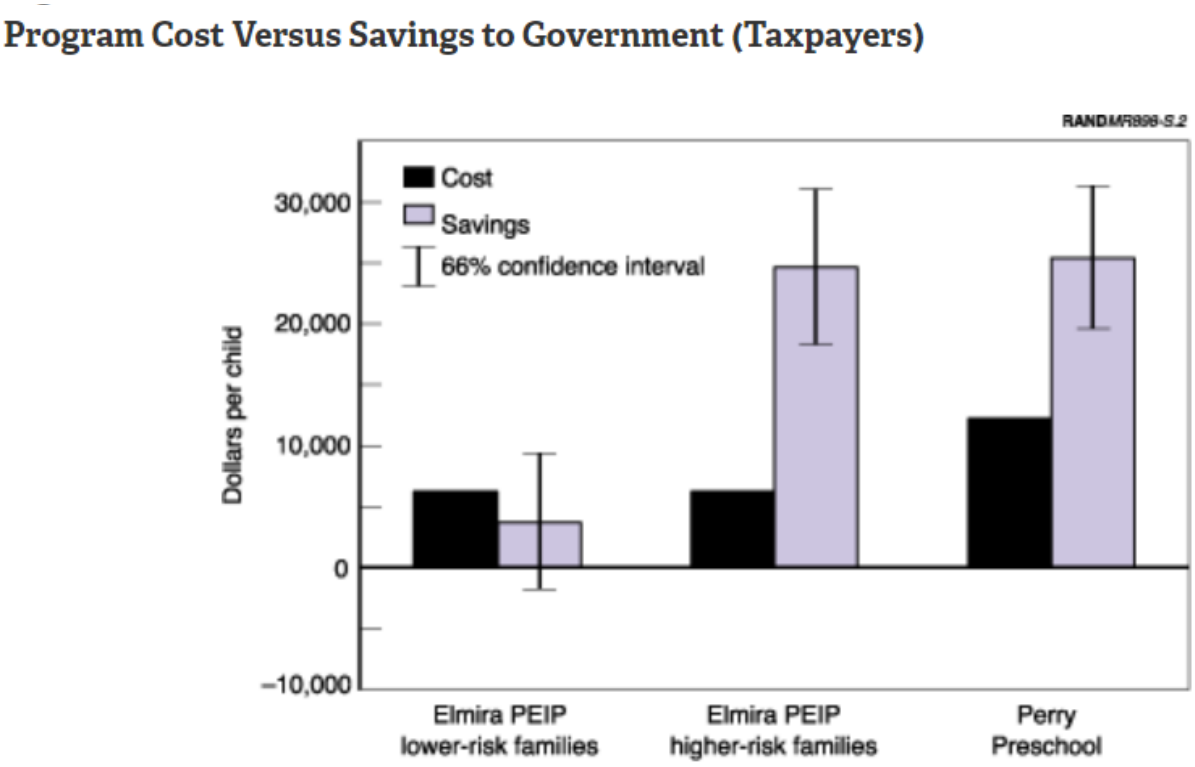
Appendix E

Staff Satisfaction Survey

1. During the 6 week SWYC Pilot Project, were the results of the SWYC survey available for the provider (MD, DO, APRN, PA) at the time of the patient's well child visit?
    a. All of the time
    b. Most of the time
    c. Neutral
    d. Some of the time
    e. Never
2. The following question is for the providers (MD, DO, APRN, or PA), if you are not a provider please select "Not Applicable." During the 6 week SWYC Pilot Project did you feel the screening results were credible?
    a. Yes
    b. No
    c. N/A
3. Please explain why you felt the results were or were not credible. Type in "Not Applicable" if you are not a provider and therefore did not answer the previous question.
    Open narrative response.
4. How satisfied were you with the work-flow used during the 6 week SWYC Pilot Project?
    a. Very satisfied
    b. Satisfied
    c. Neutral
    d. Unsatisfied
    e. Very Unsatisfied
5. During the 6 week SWYC Pilot did you follow the work-flow shared in trainings?
    a. Yes
    b. No
6. If you answered YES to the previous question, please share what made this work flow successful and what could be improved. If you answered NO to the previous question, please share what work flow you used, what made this workflow successful, and what could be improved.
    Open narrative response.
7. What changes did you see in identification of family, behavioral, and/or developmental concerns when using the SWYC tool vs the Blended Denver Developmental Tool (previous screening tool used by FQHC)?
    Open narrative response.
8. Do you have any concerns about implementing the SWYC survey at all three sites within FQHC?
    a. Yes
    b. No

9. If you answered yes to the previous question, please explain your concerns about implementing the SWYC survey at all three sites within FQHC. If you answered no, please type in “Not Applicable”
   Open narrative response.
10. If you have any additional comments related to this pilot project please share them here.
   Open narrative response.

*Health Center name was replaced with FQHC

Appendix F

Program Costs vs Savings (RAND, n.d.)