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Improving Office Workflow to Increase Developmental Screening Using the Ages and Stages Questionnaire (ASQ-3) in a Primary Care Setting

Shelby L. Sikkila

Grand Valley State University, slsikkila@gmail.com

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Title Page

Title: Improving Office Workflow to Increase Developmental Screening Using the Ages and Stages Questionnaire (ASQ-3) in a Primary Care Setting

Author Name and Academic Degree: Shelby L. Sikkila, BSN, RN

Author Primary Affiliation: Kirkhof College of Nursing, Grand Valley State University

Corresponding Author: Karen Burritt, PhD, RN, FNP-BC; Dianne Slager, DNP, RN, FNP-BC; Geraldine Terry, MD, MSN, RN; Constanza Fox, MD, FAAP

Name: Shelby Sikkila

Address: 4120 Sand Piper Dr. SE Apt 105 Kentwood MI, 49512

Email: slsikkila@gmail.com

Phone: (906) 231-9217

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Structured Abstract

Background: It is estimated that 15% of children in the United States have at least one developmental delay, sadly, less than one-fifth of these children receive early intervention services before the age of three (Vitrikas, Savard, & Bucaj, 2017).

Objectives: Design, implement, and evaluate an evidence-based protocol to assist in timely referrals of identified children to intervention services in a pediatric primary care setting through staff education of the developmental screening tool ASQ-3.

Methods: Accurate assessment of current practice revealed the need for development and implementation of a protocol. Staff education was evaluated through pre and post-surveys. Data was collected pre and post-protocol implementation through chart reviews.

Results: The post-protocol implementation data resulted in an increase in screening and 5 children being referred for early intervention services and 4 are being watched with areas of concern.

Conclusions: Through education and the development of a protocol this quality improvement project improved quality of care, referrals, workflow, reimbursement, understanding, and overall developmental screening in this primary care practice.

Implications: This developmental screening protocol will provide a foundation to increase overall screening in the practice.

Keywords: “development”, “developmental screening”, “early intervention”, and “ASQ-3”

Introduction

Early identification of developmental delay is crucial for a child's well-being (American Academy of Pediatrics [AAP], Council on Children with Disabilities, Section on Developmental Behavioral Pediatrics, Bright Futures Steering Committee, & Medical Home Initiatives for Children With Special Needs, 2006). Developmental delay can have a variety of origins; some children are born with risk factors that can predispose them to developmental delay, medical conditions can attribute to developmental delay, or children can show signs of delayed development in early childhood (AAP et al., 2006). It is estimated that 15% of children in the United States have at least one developmental delay, sadly, less than one-fifth of these children receive early intervention services before the age of three (Vitrikas et al., 2017). Early identification of a developmental concern allows the care team to further evaluate, diagnose, and treat the concerns before they are long-term problems (AAP et al., 2006). The American Academy of Pediatrics (AAP) et al. (2006) report that developmental surveillance is to be incorporated at every well-child visit and if any concerns are raised during surveillance then a standardized developmental screening test may be performed. However, parental concern and surveillance alone are often insufficient in identifying developmental delay (Vitrikas et al., 2017).

Developmental screening is an inexpensive tool to complete a comprehensive assessment and objectively identify a child's development (Berry, Garzon, & Deloian, 2013). Developmental screening tools assess for normal development using the five developmental domains; gross motor, fine motor, language, cognitive, and social skills (Scharf, Scharf, & Stroustrup, 2016). Effective implementation of developmental screening tools provides a consistent, reliable, and efficient method for screening for developmental delays while increasing parent satisfaction and allowing the provider-parent partnership in the care of their child to grow (Berry et al., 2013). Developmental screening is not intended to be diagnostic but rather to identify red flags that require further evaluation (Scharf et al., 2016). The AAP, in collaboration with Council on Children with Disabilities, Section on Developmental Behavioral Pediatrics, Bright Futures Steering Committee and Medical Home Initiatives for Children With Special Needs Project Advisory Committee developed an algorithm to guide primary care providers in developmental surveillance and screening in 2006 (AAP et al.,

2006). The algorithm development reflected a recommendation that developmental surveillance is completed at every well-child visit and that developmental screening with a valid screening tool occurs at 9, 18, and 24 or 30-month visits (AAP et al., 2006). AAP et al. (2006) state that there is no universally accepted screening tool that is appropriate for all populations and ages. Broad screening tools that address developmental domains that are culturally and linguistically sensitive as well as both reliable and valid with good sensitivity and specificity should be selected.

Developmental screening tools that produce sensitivity and specificity levels of 70-80% (as cited in Barnes, 1982), are deemed acceptable for developmental screening. The Ages and Stages Questionnaire, third edition (ASQ-3) addresses the five developmental domains and an area to address general parental concerns (U.S. Department of Health and Human Services, 2014). The test-retest reliability of the ASQ-3 is 0.91 and inter-rater reliability is 0.92 (Ages & Stages Questionnaires [ASQ], 2017). The validity of the ASQ-3 is excellent at 0.82 to 0.88 with a sensitivity of 86% and specificity of 85% overall agreement (ASQ, 2017). A study compared the sensitivity and specificity of the ASQ and the Parents' Evaluation of Developmental Status (PEDS) in preschool children and concluded that the ASQ had moderate sensitivity (82%) and specificity (78%) and the PEDS had moderate sensitivity (74%) but low specificity (64%) in screening for developmental delay (Limbos & Joyce, 2011). The ASQ has been effectively implemented in busy health care settings and found to be a reasonable and feasible method to complete developmental screening (King et al., 2010). San Antonio, Fenick, Shabanova, Leventhal, and Weitzman (2014) compared the validity and reliability of administration of the ASQ in the waiting rooms of busy pediatric offices to standardized conditions and concluded that there was no statistical difference in the fail percentage between the waiting room and standardized conditions (San Antonio et al., 2014).

Primary care providers respond well to education about screening tools and an educational intervention involving the whole practice system to increase the performance of routine screenings (Allen, Berry, Brewster, Chalasani, & Mack, 2010). As primary care offices become patient-centered medical homes, screening and referrals will improve and bridge the gap in evidence-based screening and outcomes (Mackridges & Ryherd,

2011). Overall, to properly utilize the ASQ-3 and incorporate it into a patient-centered medical home, the ASQ-3 should be offered at regular intervals to allow for adequate screening and identification of children that require further intervention. For proper implementation of the ASQ-3 in a primary care setting a whole office quality-improvement approach is recommended.

An independent, pediatric primary care office identified a problem with consistent use of the ASQ-3 in areas of screening at appropriate intervals, assessment of the screening results, real-time discussion with parents, and timely referral to appropriate organizations. For this practice, developmental screening occurred at 9 and 15 months and results of the ASQ-3 were not being reviewed with the parents the day of the visit. The purpose of this quality improvement project was to implement an evidence-based practice protocol for the use of the ASQ-3 in a primary care setting to ensure that developmental screening occurred based on the AAP recommendations to allow for accurate assessment of the results, same day review of results with the parents, and timely referral to appropriate organizations. The objective of this quality improvement project was to design, implement, and evaluate the evidence-based office protocol.

To appropriately address workflow inconsistencies of the ASQ-3 a clinical question was created: Does the implementation of an evidence-based office protocol outlining developmental screening at appropriate intervals using the ASQ-3, allow for accurate assessment of the screening results, real-time discussion with parents, and timely referral to appropriate organizations as well as improve office workflow, reimbursement, understanding, and overall developmental screening in this primary care practice? The Health Promotion Model (as cited in Pender, 1996) was used to develop concepts in relation to the use of developmental screening tools in primary care. The Kotter Change Model's eight concepts guided the implementation of the evidence-based practice protocol to improve developmental screening in a primary care practice (Kotter International, 2017).

Methods

This quality improvement project was designed to improve office workflow to increase overall developmental screening in the practice. The project took place at a mid-Michigan pediatric primary care practice that consists of two providers, one office manager, two financial/billing personnel, three medical

assistants as well as three administrative assistants. Implementation and evaluation of the intervention took place after current practice was assessed, old workflow was removed, and protocol was created.

Intervention At onset of the project old workflow was removed and the protocol outlining new staff responsibilities and workflow was put into place. The protocol reflects the AAP recommended ages for screening as well as the ASQ-3 specific age window of when each tool should be administered based on the month that is being screened. This is reflected in the ASQ-3 scheduling guide (Table 1). This guide was placed at the front desk to assist with scheduling of well-child visits within the appropriate windows and for preparing charts. Each 9, 18, and 24-month well-child visit chart within the age range was flagged with a colored sheet to remind staff to distribute the ASQ-3 at this visit. Two copies of the 9, 18, and 24-month ASQ-3 and an educational sheet were printed on cardstock, laminated, and placed on book rings for easy parent handling. An education sheet was provided to assist parents in understanding the ASQ-3, the importance of developmental screening, and to decrease questions to administrative assistants. The education sheets were provided in the form of a flyer at the 6-month well-child visit as well as laminated and attached to the ASQ-3. The electronic health record (EHR) was updated with a check box and dialog box for providers to document the ASQ-3. The checkbox allowed providers to state that the ASQ-3 was complete and the dialog box allowed providers to select normal development, areas of concern, or referral needed.

The protocol outlined the new office workflow and staff responsibilities. The workflow reflected that the administrative assistants distribute the appropriate laminated ASQ-3 and education sheet to the parent as they check in for their well-child visit. Once the ASQ-3 is complete, it is scored by the medical assistant. Once scored, the medical assistant notifies the provider that it is ready for review. The provider enters the room to complete the well visit and review the results of the ASQ-3 with the parents. Then the provider documents that the ASQ-3 was complete and their interpretation of the results in the designated fields in the EHR. Finally, the provider indicates the appropriate billing code 96110. The 96110 billing code accounts for developmental testing; limited (AAP et al., 2006).

Approach At the onset of the project, pre-implementation data was collected based on chart review to provide a baseline of children being screened using the ASQ-3 at 9, 18, and 24 month visits. A week prior to implementation, pre-implementation surveys were given to assess overall staff understanding of the ASQ-3, and the implementation protocol was presented to all staff that attended the staff meeting. Staff that were unable to attend were educated on the protocol one-on-one. Implementation of the protocol occurred in week one and weekly chart reviews were performed to assess progress of protocol implementation using a spreadsheet in week one through five. Final chart review for data collection and completion of the spreadsheet occurred in week six. The results of the data collected were reviewed with staff that attended a staff meeting in week seven. At this meeting, an assessment of staff perception and overall comments on protocol implementation occurred as well as the completion of the post-assessment surveys to assess staff education on ASQ-3. No additional education occurred during the post-assessment survey.

Measures Data from pediatric patient charts that were seen for well-child visits at 9, 18, and 24 months, were reviewed pre and post-implementation. The pre-implementation data was collected to review pediatric patients seen at the 9, 18, and 24-month visits who were provided the ASQ-3 developmental screening tool for one month prior to process change. The post-implementation data included data from pediatric patients seen at the 9, 18, and 24-month visits and provided the ASQ-3 developmental screening tool one month after process change. Data was also collected in pre and post-implementation surveys to address staff education.

Analysis The charts of patients from 9, 18, and 24-month well-child visits were reviewed to obtain data regarding the child's age, which well-child visit they were attending, if the ASQ-3 was completed (yes/no), if referral was needed (yes/no), if documented in the EHR (yes/no), and if billed using 96110 (yes/no). The quantitative data was recorded on a spreadsheet to examine pre and post-implementation differences. Pre and post-implementation survey data was collected on objective educational material such as developmental categories of the ASQ-3, valid age range for screening a 9 month old child, the AAP evidence-based ages for developmental screening, point value of a "yes" answer in scoring the ASQ-3, and appropriate billing code used to charge for the ASQ-3.

Ethical Considerations Data collection began after this project was deemed quality improvement by the Institutional Review Board (IRB). All data collected for this project was stored on an office computer at the pediatric primary care location, protected under a secured firewall, and not stored, shared, or saved on a thumb drive, or in cloud storage.

Results

The results of this project were analyzed based on the clinical question and focused on appropriate screening, referral rates, and staff education. Results for pre-implementation data focus on a chart review of one month (21 days of service) during which a total of 40 patients were seen in the practice for a 9, 18, or 24-month well-child visit. Results for post-implementation data focus on a chart review of one month (24 days of service) during which a total of 64 patients were seen in the practice for 9, 18, and 24-month well-child visit. Results of pre-implementation survey data included seven staff assessed immediately after attending a staff meeting and education. Results of post-implementation survey data included 10 staff assessed before the start of a staff meeting with no additional education.

Appropriate Screening Rates

Appropriate screening rates were defined as the patients that were correctly screened using the ASQ-3 based on the protocol; to be included, screening occurred within the proper age window, results of screening were documented in the EHR, and screening was billed correctly. Screening within the proper age window allows for accurate assessment results of the child's development at that time. Reviewing documentation allows to objectively evaluate real-time discussion with parents. Providers documented the results after discussing the results with parents. Appropriate billing allows for proper reimbursement for the organization.

Pre-implementation screening rates at 9 months, seven of 14 patients (50%) were appropriately screened. At 18 months zero of 13 patients (0%) were appropriately screened and at 24 months zero of 13 patients (0%) were appropriately screened. Overall, a total of seven of 40 patients (18%) were screened appropriately pre-implementation.

Post-implementation screening rates indicated that a total of nine of 22 (41%) patients were screened appropriately at the 9-month visit, a total of 12 of 22 (55%) patients were screened appropriately at the 18-month visit, and a total of 11 of 20 (55%) patients were screened appropriately at the 24-month visit (Figure 1). Overall, a total of 32 of 64 patients (50%) were screened appropriately post-implementation compared to 18% pre-implementation resulting in a 32% increase in screening rates.

Referral Rates

Pre-implementation referral data indicated that of the seven patients screened at 9 months, zero (0%) were referred to intervention services for developmental delay. There was no evidence in the chart review that a referral to intervention services was appropriate. Post-implementation referral data indicated that of the nine patients appropriately screened at the 9-month visit, three (33%) were referred for intervention services; one was referred for speech delay, and two for gross motor delay. Post-implementation referral data also indicated that of the 12 appropriately screened at the 18-month visit, two (17%) were referred for intervention services; one for speech delay, and one for gross motor delay. Lastly, the post-implementation referral data indicated that zero (0%) patients of the 11 patients appropriately screened at the 24-month well-visit required a referral for intervention services (Figure 2). Overall, five of 64 patients (8%) were referred to intervention services during the post implementation phase.

Staff Education

Staff education was evaluated through pre and post-surveys that were conducted at staff meetings pre and post-protocol implementation. Pre-implementation survey data found that of the seven staff two (29%) could correctly identify four of the five developmental categories that the ASQ-3 screens, four of seven (57%) could accurately identify the age range in which a 9-month screening tool must be administered, four of seven (57%) could identify when evidence-based developmental screening should occur, four of seven (57%) could identify the value of a “yes” answer in scoring the ASQ-3, and six of seven (85%) could accurately identify the correct billing code.

Post-implementation survey data found that of the 10 staff three (30%) could correctly identify four of the five developmental categories that the ASQ-3 screens, six of 10 (60%) could accurately identify the age range in which a 9-month screening tool must be administered, five of 10 (50%) could identify when evidence-based developmental screening should occur, four of 10 (40%) could identify the value of a “yes” answer in scoring the ASQ-3, and two of ten (20%) could accurately identify the correct billing code (Figure 3). Surprisingly, staff education did not improve with protocol implementation. Although this was not a positive finding, it is evident that staff education did not affect the overall screening and referral rates in this organization.

Discussion

The purpose of this quality improvement project was to implement an evidence-based practice protocol for the use of the ASQ-3 in a primary care setting that outlines the appropriate ages for developmental screening based on AAP recommendations and improves workflow through education to office staff on their responsibilities, the ASQ-3 developmental screening tool overall, the referral process, and billing requirements. Utilizing the AAP recommendations for developmental screening increased the overall developmental screening in this pediatric primary care practice and a total of five children were referred to appropriate intervention services. Of these five children, two would not have been identified without the protocol implementation and workflow change to increase developmental screening at 18 and 24 months.

All participants for this study were screened using their chronological age at the time of the well-child visit. The protocol did not reflect that the child’s age or office well-child visit be adjusted for prematurity in this study. Developmental screening is increasingly important for premature infants and careful consideration should be given to correctly adjusting the child’s age for prematurity in future studies. Adjusting the age for prematurity allows for an accurate assessment of the child’s development at that time while reducing the risk of over referral (D’Agostino et al., 2011). On further review of the study results, it was found that of the five children referred, one was born at 36 weeks’ gestation. Although age was not adjusted for this participant and a

referral was needed, it is important to note that developmental screening is not meant to be diagnostic but to be used in addition to the provider's assessment of the child.

While implementation data focuses on appropriate screening rates it should also be noted that the protocol improved overall staff compliance in screening by 37%. The improvement was demonstrated by a decrease in missed screening of children within the appropriate age window from 58% to 11% overall. While there was also an increase in correctly identifying children that should not be screened from 20 to 25% overall, close attention should be given to ensuring that children outside the age window are not screened since the non-compliant screening of these children stayed relatively the same (5% pre-implementation, 6% post-implementation). Overall screening improved 32% with only an 8% increase in errors in documentation and billing (Table 2 and Table 3).

Enhanced EHR documentation allowed four children to be appropriately identified as having developmental areas of concern needing continued surveillance. Based on low ASQ-3 scores in personal social skills, speech, and gross motor. However, the study did identify a 17% decrease in overall staff education, it is pertinent that ongoing staff education occur.

Limitations Limitations to this quality improvement project are the small sample size and short implementation window. Another limitation was the inability to measure the real-time discussion with parents.

Conclusion

Developmental screening with evidence-based tools such as the ASQ-3, has proven to be an inexpensive method to complete a comprehensive assessment and objectively identify a child's development. This quality improvement project including the development of a protocol to improve quality of care, referrals, workflow, reimbursement, and overall developmental screening in a pediatric primary care practice in mid-Michigan was successful. Improving office workflow to reflect evidence-based recommendations for developmental screening increased the number of children screened in this practice and allowed for timely referrals to early intervention services.

Implications for Practice and Further Study in the Field

The implementation of this evidence-based protocol outlining developmental screening at appropriate intervals using the ASQ-3 in this primary care practice did have positive implications. This protocol implementation allowed for increased developmental screening being performed in the primary care practice and allowed for timely referrals to early intervention services. This protocol will provide a template for future protocols to increase overall screening in this primary care practice in a variety of topics and ages.

Figures

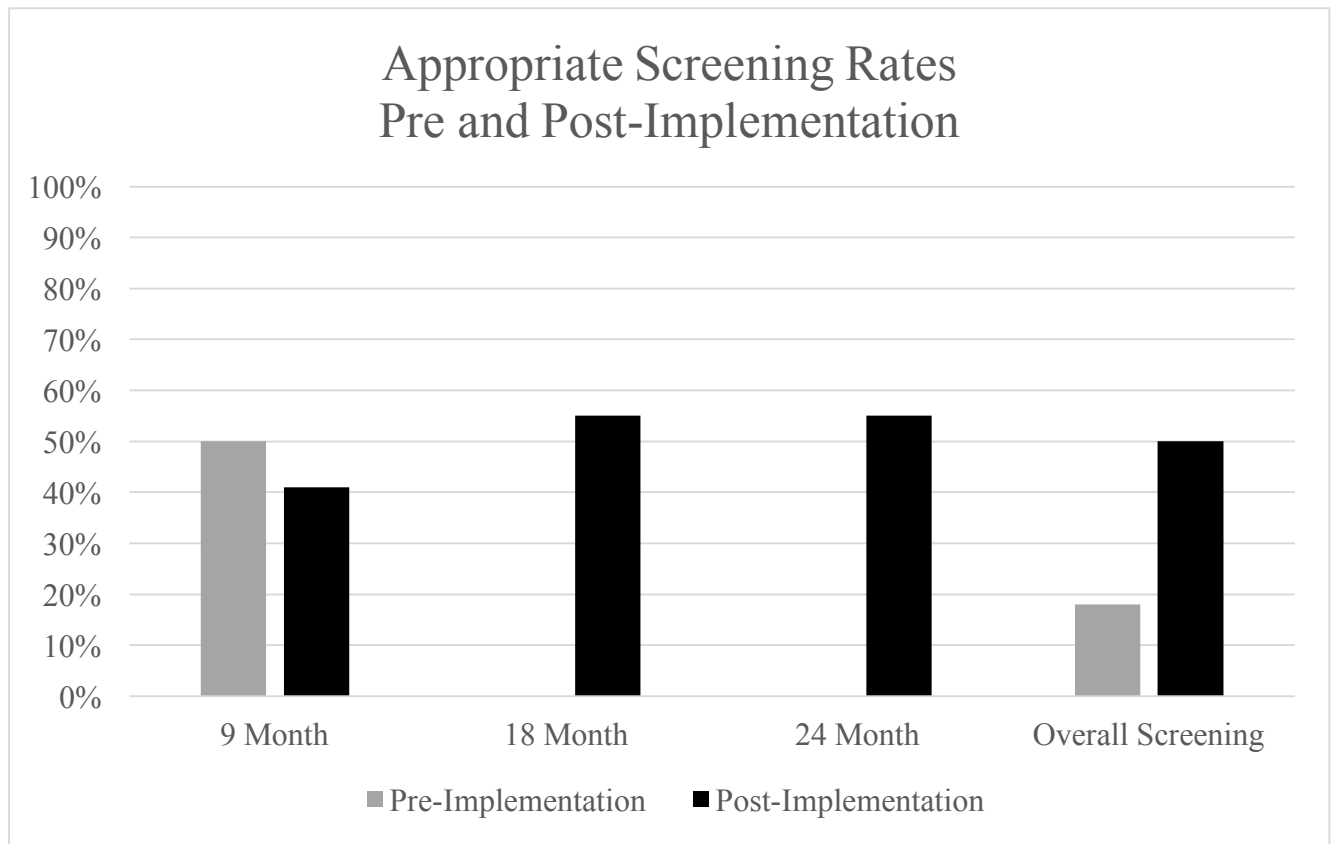


Figure 1. Screening Rates

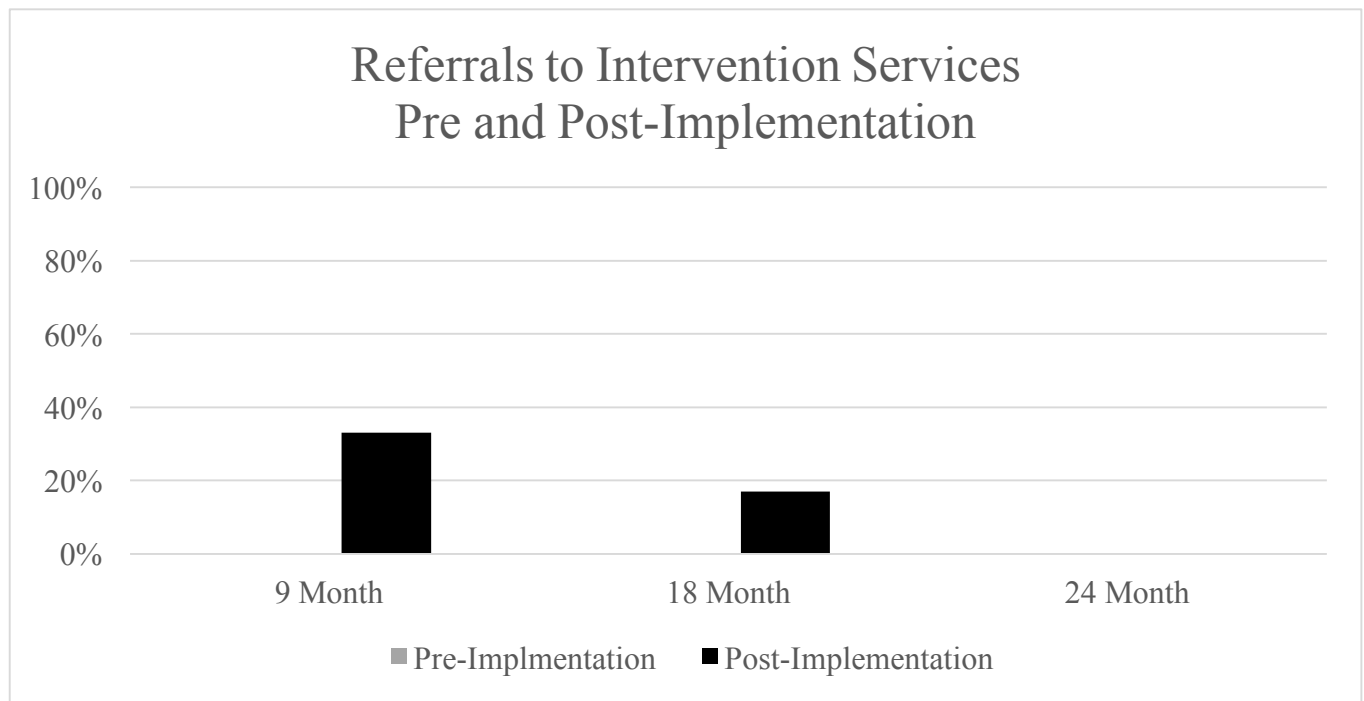


Figure 2. Referrals

Staff Education Survey Results Pre and Post-Implementation

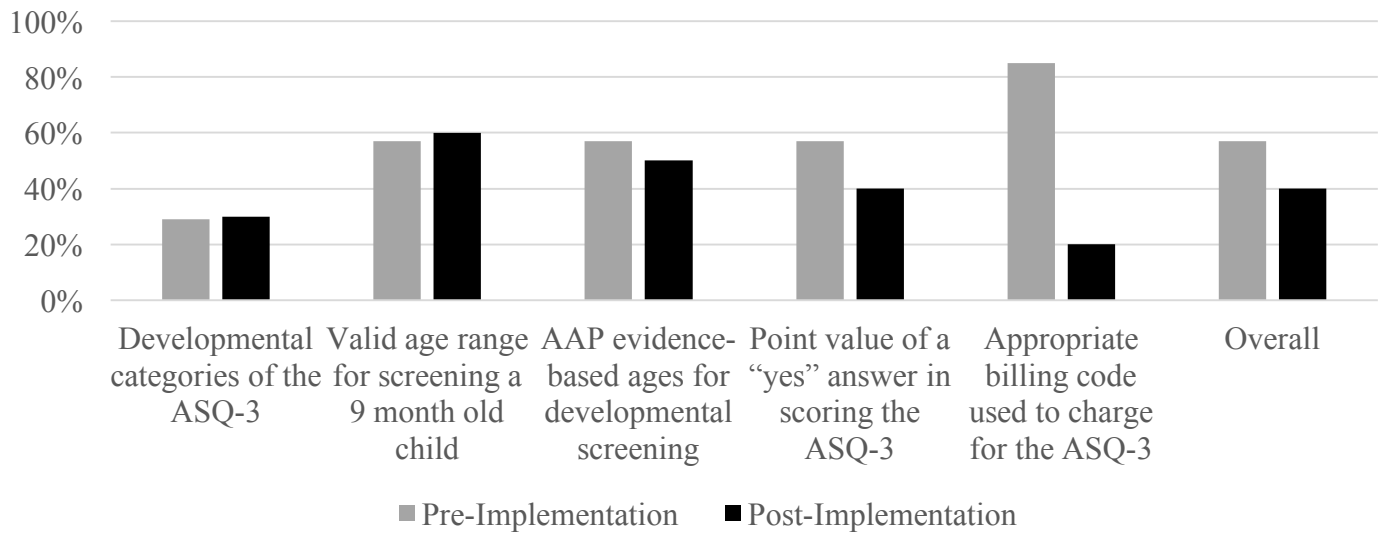


Figure 3. Staff Education

Tables

Table 1. ASQ-3 Scheduling Guide

Well-Visit	Appropriate Dates for Screening
9 Months	9 months 0 days – 9 months 30 days
18 Months	17 month 0 days – 18 months 30 days
24 Months	23 month 0 days – 25 month 15 days

Table 2. Compliance with Protocol Pre-Implementation

	Compliant		Not Compliant			
	Appropriately Screened (Within Age Range/ Results Documented/ Billed)	Appropriately Not Screened (Outside Age Range)	Outside Age Range/Results Documented/ Billed)	Within Age Range/Not Screened	Within Age Range/Results Documented/Not Billed	Within Age Range/Results Not Documented/Billed
9 Months	7/14 (50%)	1/14 (7%)	2/14 (14%)	4/14 (29%)	0/14 (0%)	0/14 (0%)
18 Months	0/13 (0%)	6/13 (46%)	0/13 (0%)	7/13 (54%)	0/13 (0%)	0/13 (0%)
24 Months	0/13 (0%)	1/13 (8%)	0/13 (0%)	12/13 (92%)	0/13 (0%)	0/13 (0%)
Total	7/40 (18%)	8/40 (20%)	2/40 (5%)	23/40 (58%)	0/40 (0%)	0/40 (0%)
Overall	38% Compliant*		63% Not Compliant*			

*Numbers may not add to 100% due to rounding

Table 3. Compliance with Protocol Post- Implementation

	Compliant		Not Compliant			
	Appropriately Screened (Within Age Range/ Results Documented/ Billed)	Appropriately Not Screened (Outside Age Range)	Outside Age Range/Results Documented/ Billed)	Within Age Range/Not Screened	Within Age Range/Results Documented/Not Billed	Within Age Range/Results Not Documented/Billed
9 Months	9/22 (41%)	6/22 (27%)	2/22 (9%)	2/22 (9%)	1/22 (5%)	2/22 (9%)
18 Months	12/22 (55%)	5/22 (23%)	2/22 (9%)	2/22 (9%)	1/22 (5%)	0/22 (0%)
24 Months	11/20 (55%)	5/20 (25%)	0/20 (0%)	3/20 (15%)	0/20 (0%)	1/20 (5%)
Total	32/64 (50%)	16/64 (25%)	4/64 (6%)	7/64 (11%)	2/64 (3%)	3/64 (5%)
Overall	75% Compliant		25% Not Compliant			

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Shelby L. Sikkila
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- Organization
 - Sindi Leak
- Family



Objectives for Presentation

1. Discuss the importance of developmental screening
2. Current literature about ASQ-3
3. Discuss the design, implementation, and evaluation of an evidence-based office protocol to improve office workflow and overall developmental screening in a primary care setting.



The Problem

- Children with developmental delays are not being identified early enough to fully benefit from early intervention programs (Rice et al., 2014).
- It is estimated that 15% of children in the United States have at least one developmental delay, sadly, less than one-fifth of these children receive early intervention services before the age of three (Vitikas et al., 2017).



Introduction

- Developmental delay
 - Variety of origins (AAP et al., 2006).
- Early identification allows for further evaluation, diagnosis, and treatment of the concerns before they are long-term problems (AAP et al., 2006).
- Developmental surveillance
 - Parental concern and surveillance alone are often insufficient in identifying developmental delay (Vitrikas et al., 2017).



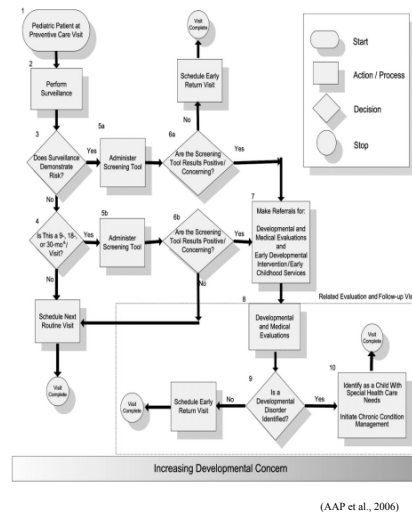
Background

- Developmental screening is an inexpensive method to complete a comprehensive assessment and objectively identify a child's development (Berry et al., 2013).
- Developmental screening tools assess for normal development using the five developmental domains (Scharf, Scharf, & Stroustrup, 2016).
- Effective implementation of developmental screening tools provides a consistent, reliable, and efficient method for screening for developmental delays while increasing parent satisfaction and allowing the provider-parent partnership in the care of their child to grow (Berry et al., 2013).



Developmental Screening

- The American Academy of Pediatrics (AAP), in collaboration with Council on Children with Disabilities, Section on Developmental Behavioral Pediatrics, Bright Futures Steering Committee and Medical Home Initiatives for Children With Special Needs Project Advisory Committee developed an algorithm to guide primary care providers in developmental surveillance and screening in 2006 (AAP et al., 2006).
- Developmental screening is not intended to be diagnostic but to identify red flags that require further evaluation (Scharf et al., 2016).
- No universally accepted screening tool that is appropriate for all populations and ages (AAP et al., 2006)
 - Tools that produce sensitivity and specificity levels of 70-80% are deemed acceptable for developmental screening (Barnes, 1982; AAP et al., 2006).



Ages and Stages Questionnaire (ASQ-3)

- Parent-completed questionnaire
- Addresses all developmental domains
- Test-retest reliability of 0.91 and inter-rater reliability of 0.92 (USDHHS, 2014; Ages & Stages Questionnaires [ASQ], 2017).
- Validity is excellent at 0.82 to 0.88 (ASQ, 2017).
- Sensitivity of 86% and specificity of 85% overall agreement (ASQ, 2017).
- Culturally and linguistically sensitive
 - Arabic, English, French, Spanish or Vietnamese (ASQ, 2017).
- 10-15 minutes for parents to complete (ASQ, 2016).
- 2-3 minutes for professionals to score (ASQ, 2016).



Organizational Assessment Tool

Canadian Foundation for Healthcare Improvement's (CFHI) Assessment Tool



(Canadian Foundation for Healthcare Improvement, 2014)



Assessment of Organization

- Inconsistencies
 - Screening
 - 9 and 15 months
 - Assessment of the screening results
 - Real-time discussion with parents
 - Timely referral
- Documentation
- Billing



SWOT Analysis

Internal	External
Strengths <ul style="list-style-type: none"> • Currently using ASQ-3 • Staff have been educated • Large population of children 9 mo-2 years • Parents willing to participate • Desire to provide high quality patient care • Appropriately billing 	Opportunities <ul style="list-style-type: none"> • Improve the quality patient care • Increased revenue through billing • Provider/parent relationship • Systemic quality improvement
Weaknesses <ul style="list-style-type: none"> • Many inconsistencies with delivery, reviewing, and retrieval process • Not reflecting AAP recommendations • Not all children being assessed due to large population • Missing opportunities for full reimbursement 	Threats <ul style="list-style-type: none"> • Length of well-child visit • Parents dissatisfaction • Parents finding new practice/provider • Results of ASQ-3 not being fully evaluated or explained to parents • Parents having to follow-up

Literature Review Findings

- Sensitivity and Specificity
 - ASQ had moderate sensitivity (82%) and specificity (78%) (Limbos & Joyce, 2011).
- Reliability and Validity
 - ASQ test-retest reliability had a 95% confidence interval for all five domains
 - No statistically significance in the reliability of the ASQ under each condition
 - The ASQ is an effective developmental screening tool for identifying risk for developmental delay in a real-world setting (San Antonio et al., 2014).
- Use of ASQ-3 in Primary Care
 - Effectively implemented in busy health care settings (King et al., 2010).
 - Primary care providers respond well to education and interventions involving the whole practice system to increase the performance of routine screenings (Allen, Berry, Brewster, Chalassani, & Mack, 2010).

Clinical Question

- Does the implementation of an evidence-based office protocol outlining developmental screening at appropriate intervals using the ASQ-3, allow for accurate assessment of the screening results, real-time discussion with parents, and timely referral to appropriate organizations as well as improve office workflow, reimbursement, understanding, and overall developmental screening in this primary care practice?



Project Plan

- Purpose
 - To implement a developmental screening protocol for the use of the ASQ-3
- Type
 - Quality improvement
- Setting
 - Mid-Michigan pediatric primary care practice
- Resources
 - Staff time
 - Computer use
 - Printed, laminated, and bought materials
- Participants
 - All children attending a 9, 18, and 24 month well-child visit.
 - Providers, office manager, financial/billing personnel, medical assistants, and administrative assistants.

IRB Approval

- Approval was granted from Grand Valley State University's Human Research Review Committee's (HRCC) Institutional Review Board (IRB) and deemed a quality improvement project.
- All data collected for this project was
 - Protected under a secured firewall on office computers
 - Not stored, shared, or saved on a thumb drive, or in cloud storage.

GRAND VALLEY STATE UNIVERSITY
Kirkhof College of Nursing

DATE: November 10, 2017

TO: Karen Burtt
FROM: HRCC
STUDY TITLE: Improving Evidence-Based Practice Protocol of the Ages and Stages Questionnaire (ASQ-3) in a Primary Care Setting
REFERENCE #: 18-1044
SUBMISSION TYPE: HRCC Research Determination Submission

ACTION: Not Research
EFFECTIVE DATE: November 10, 2017
REVIEW TYPE: Administrative Review

Thank you for your submission of materials for your planned scholarly activity. It has been determined that this project does not meet the definition of research* according to current federal regulations. The project therefore does not require further review and approval by the Human Research Review Committee (HRCC).

A summary of the reviewed project and determination is as follows:

This quality improvement study seeks to develop an office protocol that will increase screening for developmental delays through proper utilization of the ASQ-3 developmental screening tool based on evidence-based practice. The project is being carried out at a single site and is not designed to be generalizable. Therefore, this project does not meet the federal definition of "research" per 42 CFR 46.102(d).

An archived record of this determination form can be found in IRBManager from the Dashboard by clicking the "archive" link under the "My Documents & Forms" menu.

If you have any questions, please contact the Office of Research Compliance and Integrity at (616) 331-3391 or oirc@valstate.edu. Please include your study title and study number in all correspondence with our office.

Sincerely,
Office of Research Compliance and Integrity

*Research is a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge (42 CFR 46.102 (d)).

Human subject means a living individual about whom an investigator (whether professional or student) conducting research obtains data through observation or interaction with the individual or identifiable private information (42 CFR 46.102 (f)).

Scientific activities that are not covered under the Code of Federal Regulations should not be described or referred to as research in materials to participants, sponsors or in dissemination of findings.

Office of Research Compliance and Integrity | 1000 East 11th Avenue NE | Holland, MI 49423
419.229.2297 | oirc@valstate.edu | www.valstate.edu



Implementation Model

Kotter's Change Model

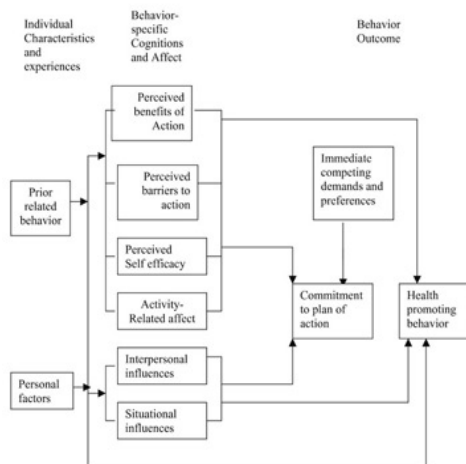


(Kotter International, 2017)



Theoretical Framework

Health Promotion Model



(McEwen, 2014)

Project Objectives

- Design an evidence-based office protocol to improve office workflow and overall developmental screening
- Remove old workflow
- Implement protocol
- Evaluate protocol

Phases of Project Implementation

1. Obtained pre-protocol data to provide a baseline
2. Developed an office protocol and educational sheets
3. Presented the protocol and educational sheets for stakeholder review
4. Conducted pre-assessment surveys during a staff meeting prior to protocol implementation
5. Removed old workflow
6. Implemented the new office protocol reflecting new workflow
7. Obtained weekly chart reviews assessing progress of implementation in week 1-5
8. Displayed weekly progress reports for organization
9. Conducted post-assessment surveys and presented a final data review to the stakeholders during a staff meeting in week 6
10. Disseminating the results



Protocol

- Age
 - Provided at 6 month visit
 - During screening
- Education
- Job Responsibilities



Preparing for Implementation

ASQ-3 Scheduling Guide

Well-Visit	Appropriate Dates for Screening
9 Months	9 months 0 days – 9 months 30 days
18 Months	17 month 0 days – 18 months 30 days
24 Months	23 month 0 days – 25 month 15 days

- Screening within the proper age window allows for an accurate assessment of the child's development at that time



Preparing for Implementation

- ASQ-3
 - Two sets of the 9, 18, and 24-month were copied on cardstock and laminated.
 - One on book rings and one on a clipboard
- Education
 - Flyer
 - Education sheet
 - Laminated
 - Attached with ASQ-3
- EHR updated
 - Check box
 - Dialog box

The screenshot shows a portion of an EHR form. At the top, there is a section labeled 'ASQ' with a checkbox. Below it is a dropdown menu for 'INTERPRETATION' with three options: 'Normal Development', 'Areas of Concern', and 'Referral Needed'. The form also includes sections for 'Care Plan:' and 'Visit Summary:'. The 'Visit Summary:' section has a vertical scroll bar on the right side.



Implementing New Workflow

1. The ASQ-3 and educational sheet were given to the parents on a laminated sheet upon arrival, by the administrative assistant, and completed with a dry erase marker in the waiting room and/or patient room.
2. After being completed, the tool was scored by the medical assistant.
3. Once scored, the medical assistant notified the provider that it is ready for review.
4. The provider entered the room and complete the well-child exam, reviewed the results of the ASQ-3 with the parents, documented, and billed.



Methods

- Data from pediatric patient charts that were seen for well-child visits at 9, 18, and 24 months
 - Pre and post-implementation
 - One month prior to and after process change
- Data was also collected in pre and post-implementation surveys to address staff education.

Measures

- The charts were reviewed to obtain data pre and post-implementation data regarding
 - Child's age
 - Well-child exam
 - ASQ-3 completed (yes/no)
 - Referred (yes/no)
 - Documented (yes/no)
 - Billed (yes/no)
- Pre and post-implementation survey data was collected on objective educational material
 - Developmental categories the ASQ-3 screens
 - Valid age range for screening a 9-month old child
 - The AAP evidence-based ages for developmental screening
 - Point value of a "yes" answer in scoring the ASQ-3
 - Appropriate billing code used to charge for the ASQ-3



Analysis and Results

- Results of this project were analyzed based on the clinical question and focused on appropriate screening rates, referral rates, and staff education.
 - Pre-implementation data
 - One month (21 days of service)
 - 40 patients
 - Post-implementation data
 - One month (24 days of service)
 - 64 patients
 - Pre-Survey
 - 7 of 11 staff completed
 - Post-Survey
 - 10 of 11 staff completed



Results

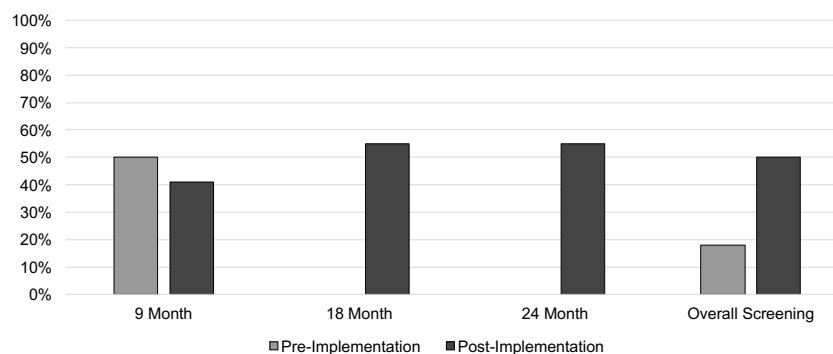
Appropriate Screening Rates

- The patients that were correctly screened using the ASQ-3 based on the protocol
 - Proper age window
 - Results were documented
 - Billed correctly



Screening Rates

Appropriate Screening Rates
Pre and Post-Implementation



Compliance with Protocol Pre-Implementation

	Compliant		Not Compliant			
	Appropriately Screened (Within Age Range/ Results Documented/ Billed)	Appropriately Not Screened (Outside Age Range)	Outside Age Range/Results Documented/ Billed)	Within Age Range/Not Screened	Within Age Range/Results Documented/Not Billed	Within Age Range/Results Not Documented/Billed
9 Months	7/14 (50%)	1/14 (7%)	2/14 (14%)	4/14 (29%)	0/14 (0%)	0/14 (0%)
18 Months	0/13 (0%)	6/13 (46%)	0/13 (0%)	7/13 (54%)	0/13 (0%)	0/13 (0%)
24 Months	0/13 (0%)	1/13 (8%)	0/13 (0%)	12/13 (92%)	0/13 (0%)	0/13 (0%)
Total	7/40 (18%)	8/40 (20%)	2/40 (5%)	23/40 (58%)	0/40 (0%)	0/40 (0%)
Overall	38% Compliant*		63% Not Compliant*			

*Numbers may not add to 100% due to rounding



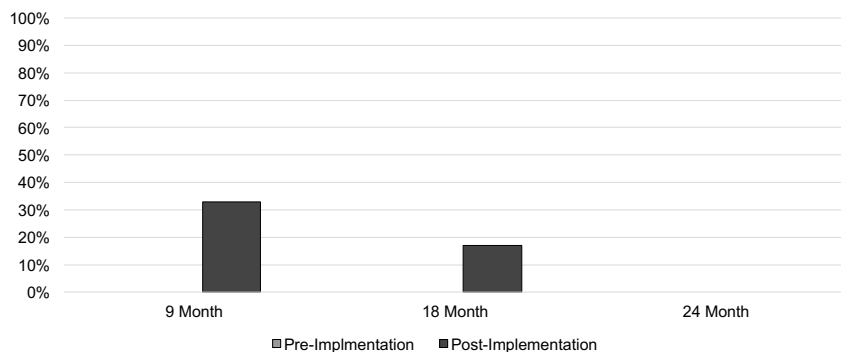
Compliance with Protocol Post-Implementation

	Compliant		Not Compliant			
	Appropriately Screened (Within Age Range/ Results Documented/ Billed)	Appropriately Not Screened (Outside Age Range)	Outside Age Range/Results Documented/ Billed)	Within Age Range/Not Screened	Within Age Range/Results Documented/Not Billed	Within Age Range/Results Not Documented/Billed
9 Months	9/22 (41%)	6/22 (27%)	2/22 (9%)	2/22 (9%)	1/22 (5%)	2/22 (9%)
18 Months	12/22 (55%)	5/22 (23%)	2/22 (9%)	2/22 (9%)	1/22 (5%)	0/22 (0%)
24 Months	11/20 (55%)	5/20 (25%)	0/20 (0%)	3/20 (15%)	0/20 (0%)	1/20 (5%)
Total	32/64 (50%)	16/64 (25%)	4/64 (6%)	7/64 (11%)	2/64 (3%)	3/64 (5%)
Overall	75% Compliant		25% Not Compliant			



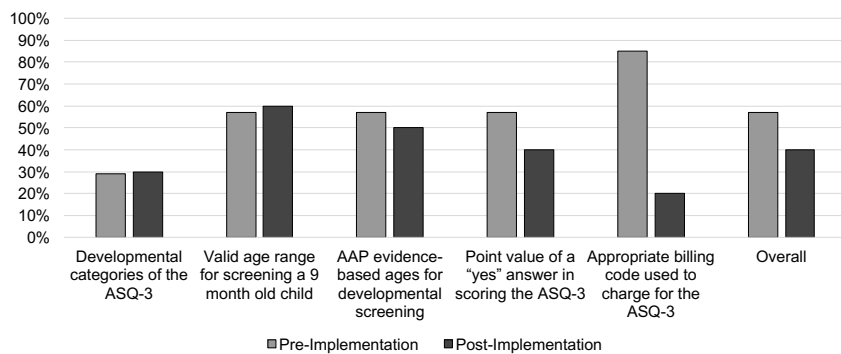
Referral Rates

Referrals to Intervention Services
Pre and Post-Implementation



Staff Education

Staff Education Survey Results
Pre and Post-Implementation



Discussion

- It can be determined that utilizing the AAP recommendations for developmental screening increased the overall developmental screening in this pediatric primary care practice and a total of five children were able to be referred to appropriate intervention services.
- Of the five children referred, two would not have been identified without the protocol implementation and workflow change to increase developmental screening at 18 and 24 months.



Discussion

- Enhanced EHR documentation allowed four children to be identified as having developmental areas of concern needing continued surveillance.
- Encouraged real-time discussion with parents.



Limitations

- Small sample size and short implementation window
- Not having an objective measure for real-time discussion with parents.
- 17% decrease in overall staff education, it is pertinent that ongoing staff education occur.



Implications for Practice

- Developmental screening being performed in the primary care practice increased and allowed for timely referrals to early intervention services.
- This protocol will provide a template for future protocols to increase overall screening in this primary care practice in a variety of topics and ages.



Conclusions

- The development of this protocol improved quality of care, referrals, workflow, reimbursement, and overall developmental screening in this pediatric primary care practice.
- Improving office workflow to reflect evidence-based recommendations for developmental screening increased the number of children screened in this practice and allowed for five children to have timely referrals to early intervention services.



Budget/Resources

Personnel or Item	Hourly Wage X Projected Time	Cost of Item
Pediatrician	\$276.00	
Physician Assistant	\$129.00	
Medical Assistant	\$48.00	
Office Manager	\$108.00	
Administrative Assistant	\$45.00	
DNP Student (In kind donation)	\$6,144.00	
Computer		\$500.00
Educational Documents/Supplies		\$40.00
Lamination		\$100.00
Dry Erase Markers		\$15.00
Total Expenses	\$606.00	\$655.00
Total Revenue	\$6,144.00	
Net	\$5,538.00	



Sustainability

- The protocol will have the ability to be adapted to other recommended screening for children, adolescents and young adults such as an adolescent risk screening tool (Hagen, Shaw, & Duncan, 2013)
 - Bright Futures recommended screening
- The organization has a new NP that has expressed interest in sustaining this project.



Dissemination

- Presented results to the organization
- Presenting my final defense to my advisory team
- Poster will be presented at Michigan NAPNAPs spring conference
- Final paper is written in manuscript form for preparation for publication
- Submitting final manuscript to Scholarworks



Reflection on DNP Essentials

- **Essential I: Scientific Unpinnings for Practice**
 - Used nursing and change theories to guide my quality improvement project.
 - Performed a thorough literature review
- **Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking**
 - Positively impacted the practice policies and procedures to meet the healthcare needs of the patient population and created and sustained changes at the organizational level.
- **Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice**
 - Used analytic methods to conduct a comprehensive literature review to determine and implement the best evidence for practice.

(American Association of College of Nursing [AACN], 2006)



Reflection on DNP Essentials

- **Essential IV: Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care**
 - Improved quality of care through enhancing EHR documentation and adequately evaluating the EHR documentation.
- **Essential V: Health Care Policy for Advocacy in Health Care**
 - Advocated for the nursing profession within the practice.
 - Project advocates for evidence-based practice for the vulnerable population
- **Essential VI: Interprofessional Collaboration for Improving Patient and Population**
 - Effectively communicated and collaborated with the practice team in development, implementation, and evaluation of the quality improvement project.

(AACN, 2006)



Reflection on DNP Essentials

- Essential VII: Clinical Prevention and Population Health for Improving the Nation's Health
 - Implementation of this quality improvement project increased referrals for developmental delay and will continue to provide a protocol focused on clinical prevention and aim to increase the overall health for this population.
- Essential VIII: Advanced Nursing Practice
 - Demonstrated advanced clinical judgment, systems thinking, and accountability through designing, implementing, and evaluating the evidence-based practice protocol for developmental screening.

(AACN, 2006)



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Questions

