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Creating equal opportunities through developmental screening at a rural health clinic

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Title: Creating equal opportunities through developmental screening at a rural health clinic

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Dianne Slager DNP, FNP.BC: Primary project advisor

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Abstract

Background: 17% of United States children have a developmental delay, but only 2-3% receive early intervention referrals (Rice et al., 2014; Zablotsky et al., 2019). Standardized developmental screening improves developmental delay identification and early intervention referrals (Guervara et al., 2013; Lipkin et al., 2020). **Objectives:** This project aimed to implement standardized developmental screening, refer positive screenings, and generate revenue through proper billing. **Methods:** A 12-week quality improvement project was implemented with the M-CHAT and Ages and Stages Questionnaire (ASQ) through four PDSA cycles at a rural health clinic for 9, 18, and 24-month well-child checks. Data were analyzed through a Fisher's Exact test. **Results:** Delay identification improved from 0/29 to 5/36 children with a p-value of 0.06. Referrals were placed for 60% of positive screenings. **Conclusions:** Although not statistically significant, identification of delays dramatically improved. **Implications:** Further study is warranted for improving early intervention referrals.

Introduction

Approximately 17% of United States children struggle with developmental delays (Zablotsky et al., 2019). Capturing developmental delays early in childhood improves pediatric health and maturation (Lipkin, Macias, & Council on Children with Disabilities 2020). The incorporation of validated developmental screening tools, such as the Ages and Stages Questionnaire (ASQ) and the Modified Checklist for Autism in Toddlers (M-CHAT), is proven to capture developmental deviations that may otherwise be overlooked (Robins et al., 2014; Sheldrick et al., 2020).

The American Academy of Pediatrics (AAP) recommends standard developmental screening at 9, 18, and 24-month wellness checks and autism screening at 18 and 24-month wellness checks (AAP, 2014). Currently, a rural Midwestern primary care office does not utilize a standardized developmental screening tool, and therefore the extent of missed developmental delays is unknown. The unplanned kindergarten retention rate of the clinic's school district is 2.5 times higher than other schools in the county (Michigan Department of Education, 2020a; Michigan Department of Education, 2020b). This data supports that children are not ready to start kindergarten, likely in part, due to delays in social, emotional, or cognitive development.

Over 12 weeks, from November 2019 through February 2020, 29 children were seen for 9, 18, and 24-month well-child visits. None were identified to have a developmental delay, which is significantly lower than the 17% national average. In hopes of improving patient outcomes, meeting AAP and rural health clinic guidelines, and increasing potential revenue, the clinical staff requested assistance in implementing a standardized developmental screening workflow.

Methods

The setting for the quality improvement (QI) project was a rural primary care office under the umbrella of a major health organization in Michigan. Approximately 40% of the patient population receives government insurance and of the remaining 60%, the majority of patients are covered by private insurance with a small percentage being self-pay. Spanish is the preferred language for over 50% of patients. The organizational assessment of strengths, weaknesses, opportunities, threats (SWOT), and stakeholders were guided by the Burke-Litwin Model (Burke & Litwin, 1992) **(**Figure 1; Figure 2). Key concepts that were monitored to improve developmental delay identification and early intervention referrals were time, staff engagement, sustainability with limited resources, and financial revenue. Primary stakeholders involved the pediatric patients, parents, and clinical staff.

Using the SWOT analysis and stakeholders as reference points, the incorporation of the AAP endorsed ASQ and M-CHAT tools into the rooming process of 9, 18, and 24-month well-child checks was initiated. the MAs would present the tools to parents of qualifying patients. After completing the screenings in the room, the MAs would transfer the data into the electronic versions in the electronic health record (EHR), which would automatically generate a score. providers would interpret the screening, review the results with parents, bill the screening in the encounter, and refer to a specialist if indicated. The CPT code 96110 is associated with childhood-instrument developmental screening and has an insurance reimbursement rate ranging between $4.95 and $13.88, with a mean of $10.58. The CPT code can be billed in the EHR and used in association with the ICD-10 code Z13.42 which is the “encounter for screening for developmental delays”.

The outline for the project plan was primarily guided by the QI Toolkit, released by the AAP, which provides step-by-step recommendations for initiating an effective developmental

screening workflow (AAP, 2018). The selected implementation strategies included staff meetings and education directed by the Training of Trainers model, EHR utilization, creation of a community resource, a workflow blueprint, staff reminders, identifying a champion, billing cheat sheets, and ongoing consultation with the student project leader (National Center for Chronic Disease Prevention and Health Promotion Division of Population Health, 2019; Powell et al., 2015)

The successes and failures of implementation were evaluated through stakeholder feedback and chart audits of completed screenings, billing, and referrals. The data were collected over four three-week Plan-Do-Study-Act (PDSA) cycles **(**Figure 3). The alterations to the workflow were created as a consequence of each cycle. The completed developmental screenings and positive screenings rates over the entire 12-week project period were compared to baseline data from the same time frame in 2020 at the clinic. A qualitative statistical analysis of pre and post-implementation data was conducted through a Fisher's Exact test.

While IRB approval was obtained from the IRB board of the umbrella organization of the clinic, there were several ethical concerns to consider throughout project execution. The involvement of children in studies always raises concern because they do not have agency. However, this project only offered potential benefits to pediatric patient outcomes, properly addressing this ethical concern. Another sensitive consideration was the relationships with the undocumented immigrant patient population, which has an increased risk of a decreased access to and comfortability with referrals. This information was protected through de-identifying data and supported by the trust that the clinical staff had previously established within the community. Parental literacy level limiting the ability to participate in screening was another consideration. While both of the selected screening tools are available in English and Spanish

and written at a fourth-grade reading level, parental comprehension could not be guaranteed. All of these ethical considerations were carefully monitored during the project.

Results

Overall, 36 children qualified for developmental screening during the 12-week time frame. Of the 36 children, 16 were successfully screened. Furthermore, five patients had positive screens for a developmental delay, and three of those children were referred to neuropsychology or developmental therapy (Table 1; Figure 4). The staff compliance fluctuated throughout the project, but ultimately a continued upward trend was noticed (Figure 5). Statistical analysis through a two-tailed Fisher's Exact test supported a marginally significant nonrandom relationship between implementing developmental screening into the workflow and delay identification ($p=0.06$). While the data did not support a statistically significant nonrandom relationship, an increase from 0/29 to 5/36 is a notable improvement.

The number of referral was not large enough to warrant statistical analysis. However, valuable information was still obtained regarding the discrepancy between developmental delay identification and referrals (Figure 6). There were two critical rationales for the failure to refer. One was a parent's concern to minimize exposure to SARS-CoV2. Ultimately, parents requested that the physician continue to follow the patient's development and wait to refer until vaccination for Covid was available. The second reason was lack of engagement in the project by one provider, which resulted in missing a positive screen during the visit.

The implementation strategies and project plan were well received by staff. Valuable descriptive statistical data included the staff feedback on education comprehension and project adaptability Likert scales. After the initial educational meeting with staff regarding the rationale for, benefits of, and instructions on, using developmental screenings, the staff feedback was

overwhelmingly positive (Table 2). Additionally, staff reported optimism about the adaptability of the project from the beginning (Table 3). The staff's beliefs about adaptability slightly decreased by the end of the project, but that was mainly due to the unforeseen complications and barriers discovered during the project (i.e., time requirements) (Table 4).

Revenue generation was the final success of the project. The cost of materials was the main expense. The notable secondary cost is the recurring expense of the MAs' time to conduct and chart screenings (Table 5). Without the inclusion of the in-kind donations of the DNP student's and the physician site mentor's time, the project is forecasted to have made a profit of $19.90 within nine weeks and an ongoing profit of approximately $7.50 with each future screening (Table 6).

Discussion

Many amendments were applied to the project implementation process due to the feedback obtained from the PDSA cycles. The changes incurred from the PDSA cycles did not always directly influence the staff and patient compliance with screening completion. However, the alterations supported the ongoing sustainability of the project. Before the project began, staff's feedback prompted the creation of a developmental screening toolbox. A concern was raised that parents may say their children have not achieved a task simply because they had not witnessed it or their children had not tried the activity. A toolbox of mirrors, stacking blocks, strings, books, and other toys was compiled based on the 9, 18, and 24-month ASQ questionnaires to be utilized if any additional evaluation was warranted.

In the second PDSA cycle, the staff raised concerns about the time constraints of completing the screenings during the visit, particularly if a parent presented with multiple young children, limiting the parental ability to complete the tools. The concept of mailing screenings

ahead of visits was suggested, and then the determination of expenses and logistics were addressed in the third PDSA cycle. The process of mailing screenings ahead of visits and informing parents during the pre-registration phone call was inaugurated in the third PDSA cycle. The products of this adjustment were not appreciated by the project's end, as the first mailed questionnaires were for appointments that fell outside of the project timeline.

A third learned lesson was the need for an engaged champion. The initial champion was selected solely based on the relationship with the DNP student. However, another staff member quickly demonstrated greater initiative in, ownership of, and engagement in the project. Therefore, the designation of the champion was reassigned, and the project thrived under the new staff leader.

The final product of the project occurred during the fourth PDSA cycle. The clinic manager requested the creation of a master binder of all questionnaires in English and Spanish to be available in the event of a concern arising for any child under five years of age, the capped age of the ASQ. A binder was created of Spanish questionnaires, and a second binder was created of English questionnaires. All screenings were laminated to endorse reusability and decrease future expenditures.

Creating a community resource guide was a byproduct of the project that was appreciated by the staff (Figure 7). While the referral process for developmental delays will need continued intervention, awareness of available resources and referrals removes a potential barrier. A copy of the resource guide was disseminated to the providers in the office. Also, a master copy with permission to edit was released to the office manager.

An intriguing anomaly that resulted from the study was the positive rate among those screened. While 5/36 (13.8%) screened aligns closely with the national benchmark (17%), 5/16

(31%) was the actual percentage of positive screens based on screenings that were given during the project. One possible explanation for this deviation is that the staff may have been prompted to administer the tool based on abnormal behaviors exhibited or voiced parental concerns in the visit, skewing the likelihood of being screened when already presumed to be delayed. Even if this is the case, the benefit of the project was supported as having the tools available aided the child in receiving needed evaluation and support.

A few factors support the sustainability of the project. Firstly, the site mentor is passionate about addressing discrepancies in health and resource equity; and with the project champion, will work to support the ongoing success of the project. Secondly, a Medicaid-certified rural health clinic's qualifications deem that a clinic must show ongoing quality improvement (Medicare Learning Center, 2019). This project benefits the clinical progress toward that goal. Finally, the primary reimbursement source for the clinic is Medicaid, which offers less payment than private insurances. Routinely billing for developmental screenings is an opportunity for increased reimbursement without expense to the patients, which improves the business model and supports the longevity of the clinic.

There were a few notable limitations to this quality improvement study. The primary limitation was the current global Covid pandemic. During the project, the clinic had several instances where providers and MAs were quarantined due to a viral infection or exposure. This resulted in a disjointed workflow and inconsistency in screening administration. The clinical staff's infections also restricted student access to the site. Further, to minimize exposure, one family opted not to pursue a referral. Other barriers were time and literacy concerns. These were addressed during the project with the conversion to mailing screenings ahead of appointments. The full impact of the effort to minimize the restraints of these barriers was not fully appreciated

during the short 12-week window.

There was an identified area for improvement after project completion regarding screening children who were born prematurely. It is recommended to use the corrected ages until age two. The ASQ considers 39 weeks full term. Three of the five positive screenings that resulted from the project were for 24-month-old children, therefore this caveat does not apply. However, the remaining two positive screenings were for 18-month-old children. The 18-month ASQ tools is approved for children aged 17 months through 18 months and 30 days (Paul H. Brookes Publishing Co, 2018). Therefore, a child born 5 weeks prematurely would still be appropriately assessed with the 18-month tool. Still, this was not confirmed for the 18-month olds that screened with developmental delays during the project timeline. The clinical staff will be educated on how to assess premature children in upcoming encounters to strengthen the validity of the project.

Conclusion

Health care professionals often desire to comply with practice recommendations, like developmental screening, but unfortunately, time and resources can limit opportunities. The use of DNP students and, eventually, professionals trained in implementing quality improvement projects creates a bridge between what is recommended and what is reality. Creating a workflow to support routine developmental screenings aligning with the AAP guidelines in a rural primary care clinic required strong site mentor support, staff buy-in, and flexibility. Each clinic can successfully find a way to screen a child for developmental delays, but creativity may be needed to support the change in workflow. Each child deserves a medical home where they can be given every opportunity to succeed, and every clinic has the opportunity to participate.

Implications for Further Study

This project opened the door for additional opportunities to improve patient care. Additional research on improving referral rates and the coordination of care between primary care providers and specialists would be beneficial knowledge. In this project patient population, many barriers exist that inhibit access to resources.

Kindergarten readiness is another interesting topic that this project did not address, but would be interesting to investigate further. In Michigan, each school district funds early intervention programs. Working with elementary school administrators and combining knowledge bases to address barriers and improve kindergarten readiness may pave the way for continued improved child outcomes.

Tables

Table 1

PDSA Cycle Overview

	PDSA #1	PDSA #2	PDSA #3	PDSA #4	Total
Completed	5/15	7/11	3/9	1/1	16/36
Completed %	33%	63.6%	33%	100%	44%
Abnormal	1/5	1/7	2/3	1/1	5/16
Abnormal %	20%	14%	66%	100%	25%
Abnormal Referred	1/1	0/1	1/2	1/1	3/5
Completed Billing	5/5	7/7	3/3	1/1	16/16

Note. This is the sum totals of each PDSA cycle to show the progression of compliance and response to amendments throughout the project.

Table 2

Education Evaluation

	Average Score
The presented material was helpful	4 *(Strongly Agree)*
I understood the presented material	4 *(Strongly Agree)*
My questions were answered	3.8 *(Strongly Agree)*
I feel confident in my ability to use the presented material	3.7 *(Strongly Agree)*
Comments: *"You did a great job with explaining all details"*	

Note. This is the feedback obtained from eight staff members after the educational meeting. The Likert scale was scored 0 (strongly disagree) to 4 (strongly agree).

Table 3

Developmental Screening Project Adaptability Evaluation Pre-Implementation

	Average Score
The project workflow is sustainable	3.9 *(strongly agree)*
I am able to complete my work in a timely manner	3.7 *(strongly agree)*
I feel supported in this project implementation process	4 *(strongly agree)*
Comments: *"I feel it will take time to see if the routine/timing work"*	
Note. This is the feedback obtained from eight staff members after the educational meeting regarding beliefs about the adaptability of the project into the workflow. The Likert scale was scored 0 (strongly disagree) to 4 (strongly agree).	

Table 4

Developmental Screening Project Adaptability Evaluation Post Implementation

	Average Score
The project workflow is sustainable	*3.7*
I am able to complete my work in a timely manner	*3.0*
I feel supported in this project implementation process	*4*
Comments: *"Depends on the parent's reading level"*	
Note. This is the feedback obtained from eight staff members after the final PDSA cycle. The Likert scale was scored 0 (strongly disagree) to 4 (strongly agree).	

Table 5

Budget: Expenses

ASQ and M-Chat License (previously obtained by umbrella org.)	$0.00
MA Time (10 minutes per patient=$2.48)	$39.68
DNP Student (50-hour in-kind donation)	($2,250.00)
Physician Site Mentor (10-hour in-kind donation)	($1,000.00)
Supplies (paper, lamination, ring, dry erase markers, 45 mailed)	$109.70
Meetings	($50.00)
Total	$149.38

Note. The finalized budget of the project, including the mailing fees acquired during the final PDSA cycle.

Table 6

Final Budget

Revenue (16 screenings)	$169.28
Expenses	($149.38)
Total	$19.90

Note. The project achieved a profit within 12 weeks. In the future, an average of $7.50 profit from each screening is anticipated, in consideration of mailing and MA time fees.

Figures

SWOT Analysis	
Strengths	**Weaknesses**
• Part of a large Midwest healthcare system • *The clinic has established trust within the community* • *Clear leadership and teamwork under new manager* • Providers are established with high patient retention • *All providers speak English and Spanish (tools also)* • *Established workflow for rooming*	• *Facility resources* • Not all staff speaks Spanish • New EHR • Lack of knowledge of screening recommendations • *High percentage under resourced population (40% governmental insurance)*
Opportunities	**Threats**
• Improved patient outcomes • Support for Medicaid certified Rural Health Clinic Status • Insurance financial reimbursement • Meet recommended standards of care	• *The potential risk of not obtaining rural health clinic status* • Fear of discovery by undocumented immigrants • *Time* • *Covid-19*

Figure 1. This figure demonstrates the SWOT analysis of the organizational context. Notable factors are italicized.

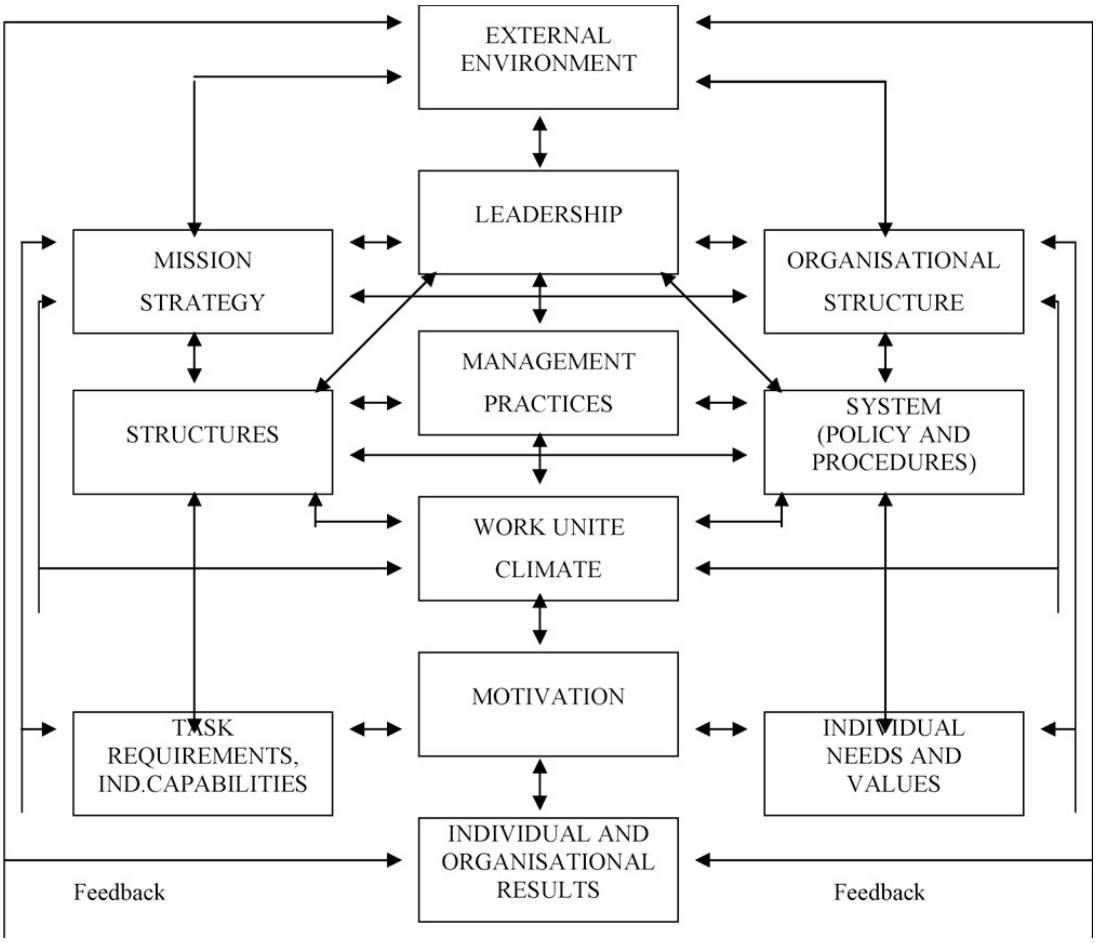

Figure 2. Burke-Litwin model. Adapted from "A causal model of organizational performance and change," by W. Burke and G. Litwin. Copyright 1992 by Journal of Management.

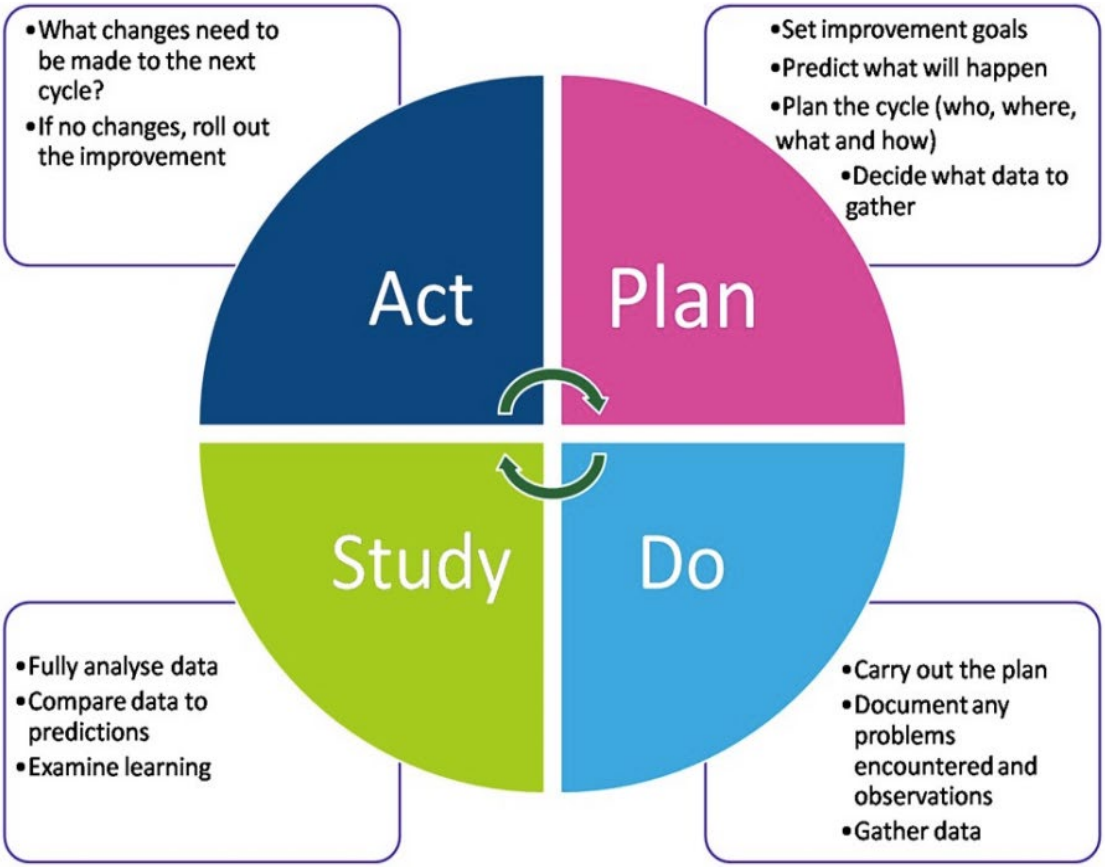

Figure 3. The PDSA Cycle Framework. Adapted from "Diabetes Toolkit - Think, Check, Act," by Health Improvement Scotland, 2017, Retrieved from https://ihub.scot/project-toolkits/diabetes-think-check-act/diabetes-think-check-act/getting-started/plan-do-study-act/. Copyright 2020 by The Improvement Hub.

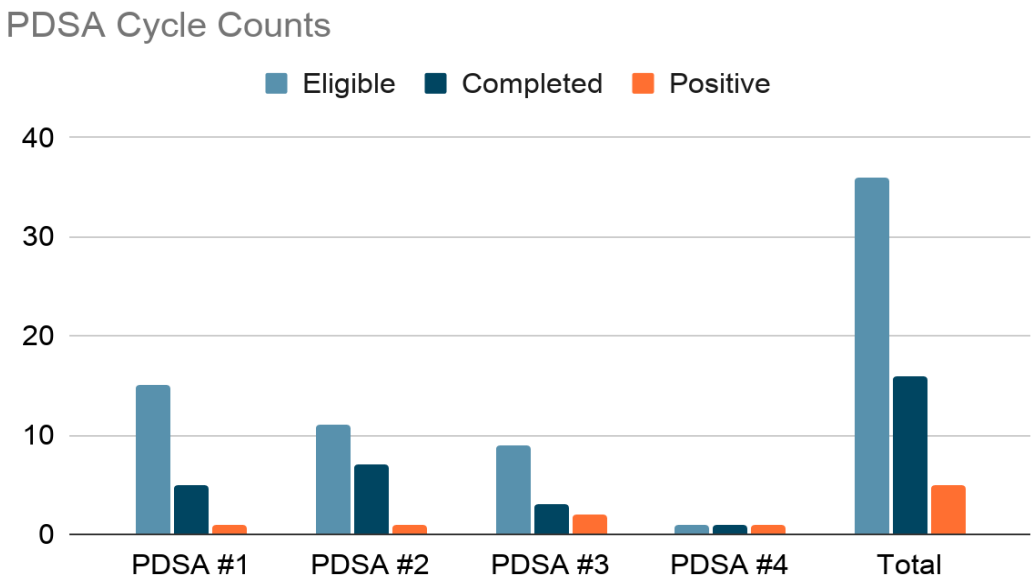

Figure 4. Bar graph of patients who were eligible for, completed, and had positive results of 9, 18, or 24-month developmental screenings.

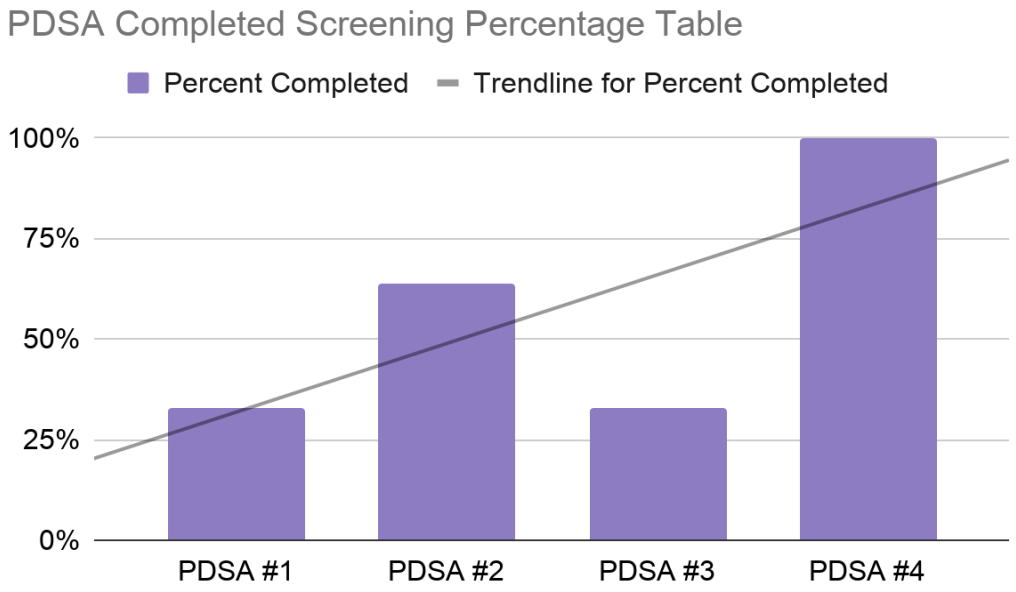

Figure 5. Bar graph of percentages of completed eligible screenings to demonstrate project compliance with evidence of progressive, upward trend.

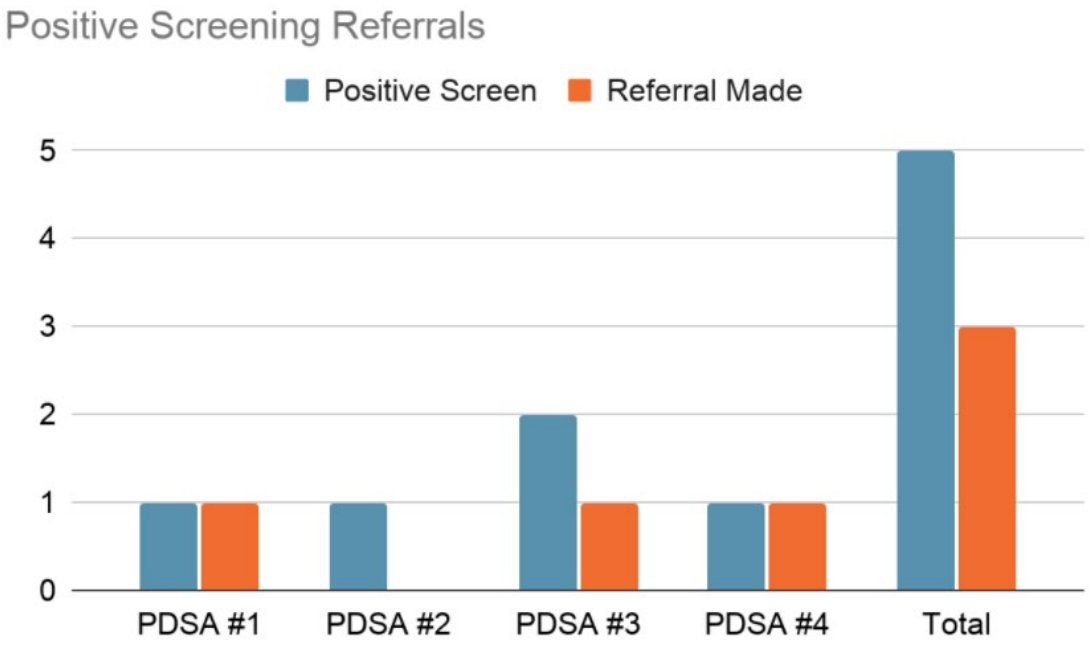

Figure 6. Bar graph demonstrating the number of patients who had a positive developmental delay screening compared to the amount of early intervention referrals that were placed.

Organization	Services Provided	Insurance/ Payment	Address	Contact Information
Adult Education	• Ages 18+ • High school diploma • GED • English as a second language • Workforce preparation and job training • No residency requirements for online schooling	Free	• Cedar Springs • Comstock Park • Lowell • Sparta • NW Grand Rapids	**Phone:** 616.887.7321 **Website:** https://www.spartaschools.org/departments/adult-education/
Arbor Circle	• Counseling services • Psychiatry • Recovery services • Early childhood parental skills and education • Safe shelter program for children 10-17 facing homelessness (The Bridge) • After school programs	Free	Kent: 1115 Ball Ave. NE Grand Rapids, MI 49505 Newaygo: 232 East 82nd St. Newaygo, MI 49337	**Email:** info@arborcircle.org **Kent Phone:** 616.456.6571 **Newaygo Phone:** 231.652.1780
Arc of Kent County	• For individuals with intellectual and physical disabilities • Advocacy for services, education, housing, employment, recreation, family support • Referrals to schools, health care, attorneys, etc	Free	2922 Fuller Ave. NE Ste 201 Grand Rapids, MI 49505	**Email:** patt@arckent.org **Phone:** 616.459.3339 **Website:** arckent.org

Figure 7. Sample of the community resource guide that was created and disseminated to the clinic.

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Creating Equal Opportunities Through Developmental Screening at a Rural Health Clinic

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DNP Project Final Defense

March 25, 2021

Grand Valley State University

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Presentation Objectives

1. Review the identified gap in care and plan
2. Synthesize the project implementation process
3. Evaluate the implementation results
4. Discuss future recommendations for care

Phenomenon of Interest: Background

- 17% of U.S. children have a developmental delay (Zablotsky et al., 2019)
- Only 2-3% of qualifying children are referred by age 3 (Rice et al., 2016)
- Early identification through screening is EBP for improving outcomes (Lipkin, Macias, & Council on Children with Disabilities 2020; Rice et al., 2014)

Project Setting

- Part of a larger health organization
- 2 MDs, 3 PAs, 1 SW, 8 MAs
- 40% Medicaid/Medicare
- 55% Spanish speaking

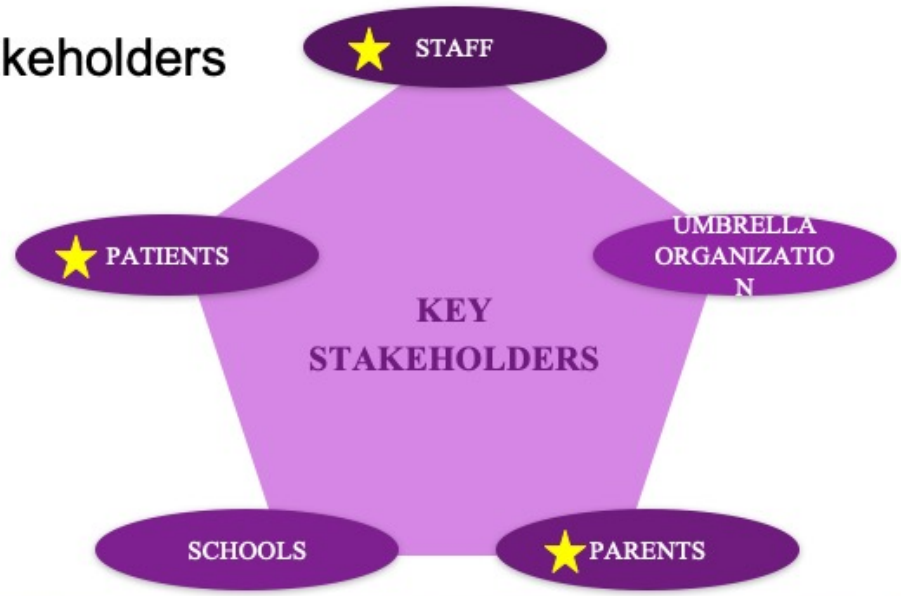
- Applying to be a Medicaid certified RHC
- Not a standardized practice to developmental screen

Organizational Context

SWOT Analysis

Strengths	Weaknesses
· Part of a large Midwest healthcare system · *The clinic has established trust within the community* · *Clear leadership and teamwork under new manager* · Providers are established with high patient retention · *All providers speak English and Spanish (tools also)* · *Established workflow for rooming*	· *Facility resources* · Not all staff speaks Spanish · New EHR · Lack of knowledge of screening recommendations · *High percentage under resourced population (40% governmental insurance)*
Opportunities	**Threats**
· Improved patient outcomes · Support for Medicaid certified Rural Health Clinic Status · Insurance financial reimbursement · Meet recommended standards of care	· *The potential risk of not obtaining rural health clinic status* · Fear of discovery by undocumented immigrants · *Time* · *Covid*

Stakeholders



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Available Knowledge

What is known about the problem and intervention:

- Screening and intervention are endorsed by the AAP (AAP, 2014)
- Established tools (Robins et al., 2014; Sheldrick et al., 2020)
- Initial baseline: 806 qualifying patients; only 8.6% coded for a developmental delay in the past year
- *Updated baseline data: 0/29 coded for development delay during 12 week winter season last year*
- Improved patient satisfaction and perception of care (Alawami, Perrin, & Sakai, 2019)

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Literature Review Synthesis

Theme	Literature Support	Reference
Team Engagement	Improved adaptation with staff input	Alawam et a., 2019 Bright et al., 2019 Gellasch, 2015 Ibañez et al., 2019
Demographics	Minorities and education level	Khowaja et al., 2015
Time	Mailing before visit, limits time for standard office visit assessment	Ibañez et al., 2019 Valla et al., 2019
Implementation Model	Improved adaptation with model utilization; Change Packet, PDSA	Al-Mamari et al., 2019; Bright et al., 2019

Phenomenon of Interest Framework: PARIHS

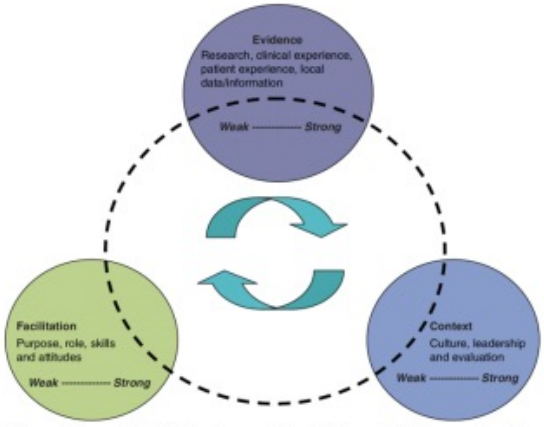

Figure 3. The PARIHS framework. Adapted from "Aspects Affecting Occupational Therapists' Reasoning When Implementing Research-Based Evidence in Stroke Rehabilitation," by H. K. Kristensen, T. Borg, and L. Hounsgaard, 2011, *Scandinavian Journal of Occupational Therapy, 19,* p. 120. Copyright 2011 by Taylor & Francis Ltd.

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Clinical Question

Does standardized developmental screening implementation with the ASQ and M-CHAT tools in a rural Midwest primary care clinic improve pediatric patient developmental delay identification and referral placement over a three month time frame?

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PROJECT PLAN

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Project Overview

- *Purpose*: To create equal opportunities for pediatric patients through implementing standardized developmental screening of patients aged two years and younger into an established clinic workflow
- *Design*: Quality Improvement

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Project Objectives

01	Implement standardized developmental screening into the 9, 18, and 24 month well child check rooming process	3-month period (November - February)
02	Sign off on staff ASQ and MCHAT scoring and documentation competencies	October 2020
03	Educate staff on identification of positive screening with an established tool and recommended follow up with community resources	November 2020
04	Initiate routine developmental screening coding and billing for all 9, 18, and 24 month well child checks by providers	November 2020

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Ethical Considerations

- Pediatric patients
- Undocumented population
- De-identified patient data
- Literacy level
- IRB approval

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Ethical Considerations: IRB Approval

[redacted]

NOTICE OF CLINICAL QUALITY IMPROVEMENT MEASUREMENT DESIGNATION

To: Allison Hensberd, RN, DNP-s
[redacted]

Re: IRB# 20-0724-2
Creating Equal Opportunities Through Developmental Screening at a Rural Health Clinic: A Quality Improvement Study

Date: 07/29/2020

This is to inform you that the [redacted] Regional Institutional Review Board (IRB) has reviewed your proposed research project entitled "Creating Equal Opportunities Through Developmental Screening at a Rural Health Clinic: A Quality Improvement Study". The IRB has determined that your proposed project is not considered human subjects research. The purpose and objective of the proposed project meets the definition of a clinical quality improvement measurement. All publications referring to the proposed project should include the following statement:

> "This project was undertaken as a Clinical Quality Improvement Initiative at [redacted] and, as such, was not formally supervised by the [redacted] Regional Institutional Review Board per their policies."

The IRB requests careful consideration of all future activities using the data that has been proposed to be collected and used "In order to educate and train staff regarding the Ages and Stages Questionnaire (ASQ-3) and the Modified Checklist for Autism in Toddlers (M-CHAT) questionnaires, and their implementation into the workflow, scoring parental responses and determining appropriate referrals of children aged 0-3 years with developmental delays."

The IRB requests resubmission of the proposed project if there is a change in the current clinical quality improvement measurement design that includes testing hypothesis, asking a research question, following a research design or involves overriding standard clinical decision making and care.

Please feel free to contact me if you have any questions regarding this matter.

[redacted], PharmD, FCCP, BCPS
IRB Chairperson

Copy: File

Institutional Review Board - [redacted]

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Implementation Framework: PDSA

Figure 4. The PDSA Cycle Framework. Adapted from "Diabetes Toolkit - Think, Check, Act," by Health Improvement Scotland, 2017, Retrieved from https://ihub.scot/project-toolkits/diabetes-think-check-act/diabetes-think-check-act/getting-started/plan-do-study-act/. Copyright 2020 by The Improvement Hub.

Implementation Strategies

1. Conduct educational meetings
2. Distribute educational materials
3. Engage stakeholders
4. Make billing easier
5. Provide ongoing consultation
6. Develop a formal blueprint
7. Remind clinicians
8. Promote adaptability
9. Use other payment schemes
10. ID and prepare champions

Powell et al., 2015

Implementation Strategies: Education

- Meetings
  - MA meeting
  - Provider meeting
  - Monthly over lunch (with snacks)
- Materials
  - Questionnaire administration and scoring
  - Smartphrases
  - Community resource list

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Education Model

Training of Trainers Model

Figure 5. Training of Trainers Model. Adapted from "Understanding the Training of Trainers Model" by the National Center for Chronic Disease Prevention and Health Promotion Division of Population Health, 201i, Retrieved from https://www.cdc.gov/healthyschools/tths/train_trainers_model.htm#:~:text=The%20Training%20of%20Trainers%20(ToT,the%20material%20to%20other%20people.

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Community Resource Guide

SPARTA HEALTH CENTER RESOURCE GUIDE

Organization	Services Provided	Insurance/Payment	Address	Contact Information
Adult Education	• Ages 18+ • High school diploma • GED • English as a second language • Workforce preparation and job training • No residency requirements for online schooling	Free	• Cedar Springs • Comstock Park • Lowell • Sparta • NW Grand Rapids	**Phone:** 616.887.7321 **Website:** https://www.spartaschools.org/departments/adult-education/
Arbor Circle	• Counseling services • Psychiatry • Recovery services • Early childhood parental skills and education • Safe shelter program for children 10-17 facing homelessness (The Bridge) • After school programs	Free	Kent: 1115 Ball Ave. NE Grand Rapids, MI 49505 Newaygo: 232 East 82nd St. Newaygo, MI 49337	**Email:** info@arborcircle.org **Kent Phone:** 616.456.6571 **Newaygo Phone:** 231.652.1780
Arc of Kent County	• For individuals with intellectual and physical disabilities • Advocacy for services, education, housing, employment, recreation, family support • Referrals to schools, health care, attorneys, etc	Free	2922 Fuller Ave. NE Ste 201 Grand Rapids, MI 49505	**Email:** patt@arckent.org **Phone:** 616.459.3339 **Website:** arckent.org
Bright Beginnings	• Prenatal-Kindergarten • English and Spanish • Parent educator home visits • Playgroups • Parent meetings • Hearing, vision, development, social, emotional screenings	Free	Varies	**Phone:** 616.365.2276 **Website:** https://www.kentisd.org/early-childhood/bright-beginnings/

Implementation Strategies: Adaptation

- Easier billing
  - Cheat sheets by provider work space
- Stakeholders
  - Monthly meetings/PDSA cycles
- Ongoing consultation
  - Accessibility to DNP student
  - PDSA cycles to implement feedback

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Billing Cheat Sheet

WAIT! DID I BILL MY DEVELOPMENTAL SCREENING?	
ICD-10 **may use more than one**	**CPT**
Z13.42 Encounter for screening for global developmental delays	96110
F80.1 Expressive language disorder	
F82 Specific developmental disorder of motor function	
F98.9 Unspecified behavioral and emotional disorders with onset usually occurring in childhood and adolescence	

Data Collection: Implementation Strategies

Topic	Concept	How Measured	When Measured	Who Measures
Implementation Strategies	Develop a formal blueprint	Discussion	Pre-implementation; with each PDSA cycle	Student
	Identify champion	Discussion	Pre-implementation	Student
	Develop educational/ resource materials	Discussion, Likert scale survey	Pre-implementation	Student
	Promote adaptability	Discussion, Likert scale survey	Pre-implementation; with each PDSA cycle	Student
	Engage stakeholders	Discussion	Pre-implementation; with each PDSA cycle	Student

Data Collection Tool: Education Results

With educational meeting

Education Evaluation	
	Average Score
The presented material was helpful	**4** *(Strongly Agree)*
I understood the presented material	**4** *(Strongly Agree)*
My questions were answered	**3.8** *(Strongly Agree)*
I feel confident in my ability to use the presented material	**3.7** *(Strongly Agree)*
Comments: *"You did a great job with explaining all details"*	

Data Collection Tool: Adaptability (*PRE*)

Given with PDSA Cycles

Developmental Screening Project Adaptability Evaluation	
	Average Score
The project workflow is sustainable	**3.9** *(strongly agree)*
I am able to complete my work in a timely manner	**3.7** *(strongly agree)*
I feel supported in this project implementation process	**4** *(strongly agree)*
Comments: *"I feel it will take time to see if the routine/timing work"*	

Data Collection Tool: Adaptability (*POST*)

Given with PDSA Cycles

Developmental Screening Project Adaptability Evaluation	
	Average Score
The project workflow is sustainable	***3.7** (strongly agree)*
I am able to complete my work in a timely manner	***3.0** (agree)*
I feel supported in this project implementation process	***4** (strongly agree)*
Comments: *"Depends on the parent's reading level"*	

Data Collection: Patient Outcomes

Topic	Concept	How Measured	When Measured	Who Measures
Patient outcomes	Developmental screening capture rates	EHR audit	Pre (1 year retrospective); monthly with PDSA cycle; post implementation (February 2021)	Student
	Positive ASQ rate	EHR audit	monthly with PDSA cycle; post implementation (February 2021)	Student
	Referral/resources rate from positive ASQ	EHR audit	monthly with PDSA cycle; post implementation (February 2021)	Student
	Positive MCHAT	EHR audit	monthly with PDSA cycle; post implementation (February 2021)	Student
	Referral/resources rate from positive MCHAT	EHR audit	monthly with PDSA cycle; post implementation (February 2021)	Student

Data Collection Tool: ASQ 9 Month

Figure 8. Nine month ages and stages questionnaire. "Ages and Stages Questionnaire: 9 Month Questionnaire," by J. Squires and D. D. Bricker, 2009. Copyright 2009 by Paul H. Brookes Publishing Company.

Data Collection Tool: MCHAT-

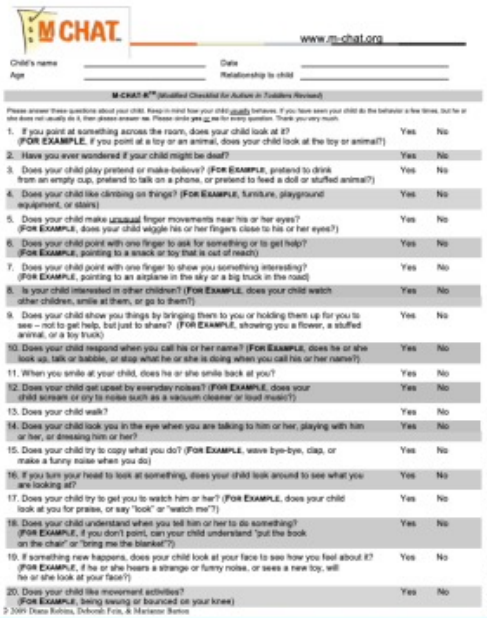

Figure 9. Modified checklist for autism in toddlers (M-CHAT). "Modified Checklist for Autism in Toddlers, Revised with Follow-Up," by D. Robins, D. Fein, and M. Barton, 2009, retrieved from https://cms.m-chat.org/LineagenMChat/media/Lineagen-M-Chat-Media/mchatDOTorg.pdf. Copyright 2009 by Diana Robins, Deborah Fein, & Marianne Barton.

Data Collection

Tool submitted to the IRB:

Patient	Age	Sex	ASQ-3 score	ASQ-3 Interpretation	MCHAT score	MCHAT Interpretation	Referral	Referral Type

Timeline

March 2020

- Discussed project proposal with Dr. Utter

June 26, 2020

- Finalized organizational assessment

July 24, 2020

- Completed literature review

July 28, 2020

- IRB approval

Timeline con't

October 14, 2020

- Defense proposal

October 21 & 22, 2020

- Staff education on scoring, documentation, and interpretation

October 28, 2020

- Initiation of project material creation

November 18, 2020

- First PDSA Cycle: Data collection beings (delay due to office Covid outbreak)

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Timeline con't

December 8, 2020

- End of first PDSA Cycle

December 9, 2020

- Second PDSA Cycle begins

December 30, 2020

- End of second PDSA Cycle

December 31, 2020

- Third PDSA Cycle begins

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Timeline con't

January 20, 2021

- Third PDSA Cycle ends

January 21, 2021

- Fourth PDSA Cycle beings

February 11, 2021

- Fourth PDSA Cycle ends

February 13, 2021

- Data Analysis

Timeline con't

March 25, 2021

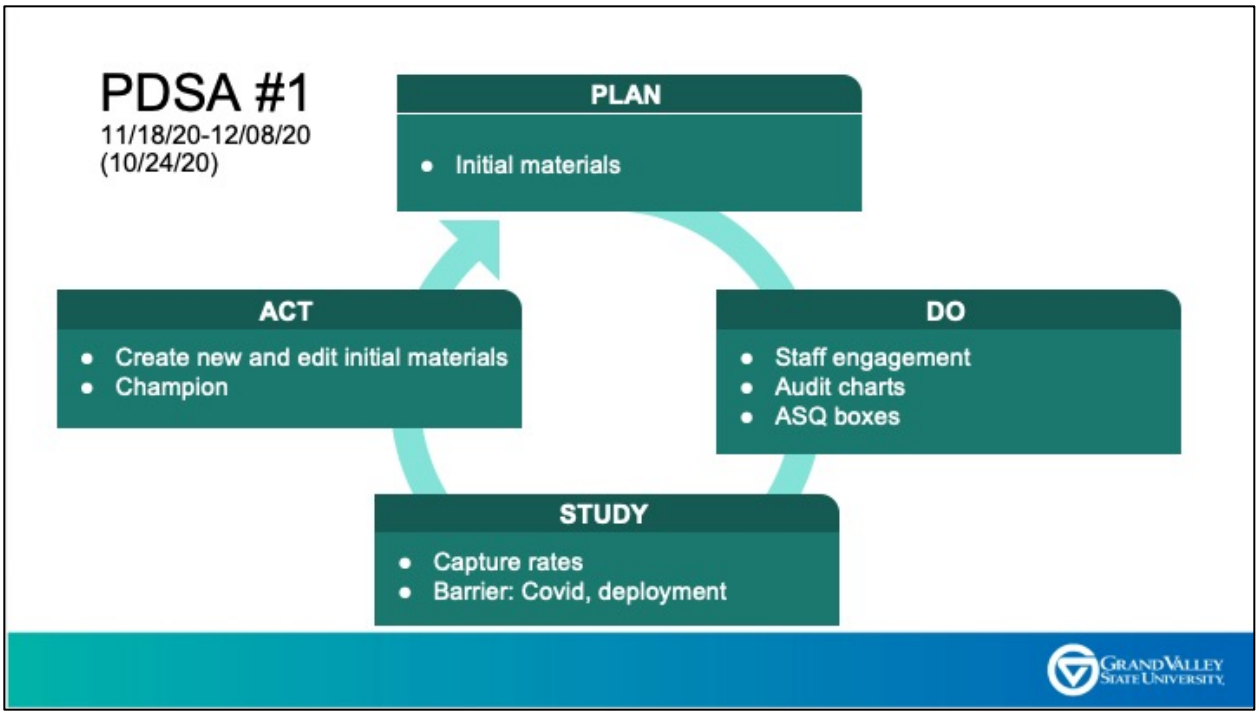
- Final defense

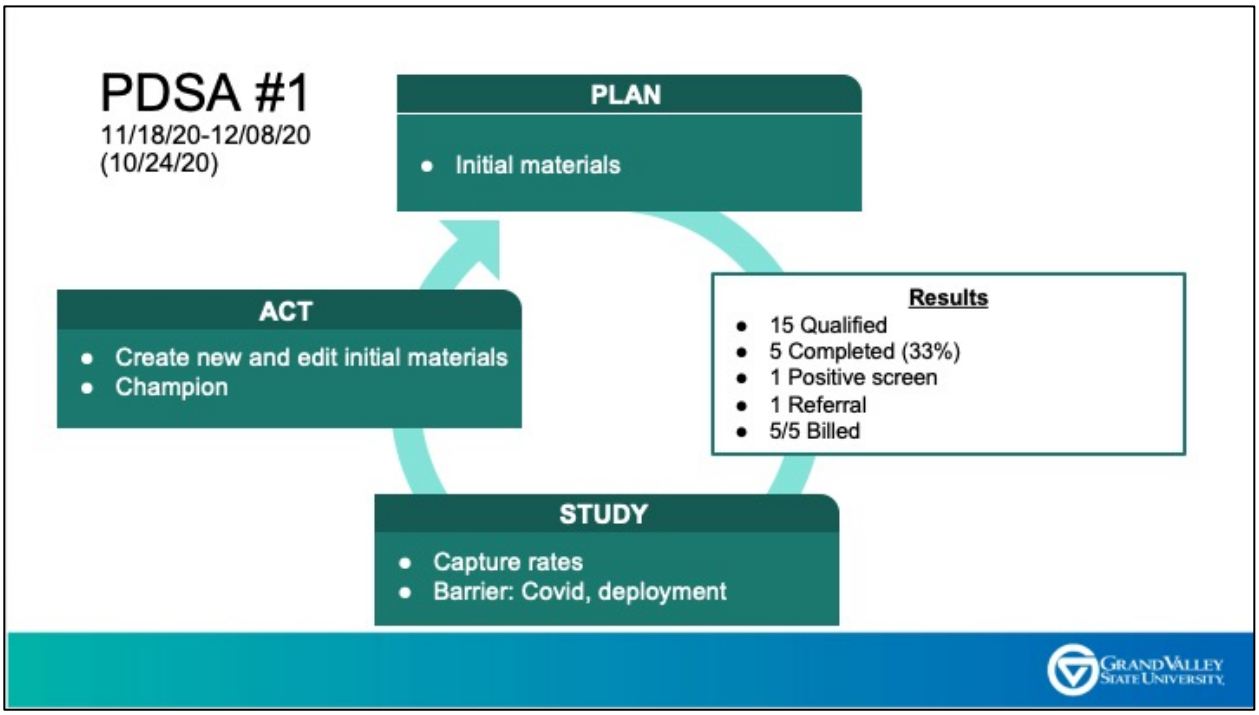
April 2021

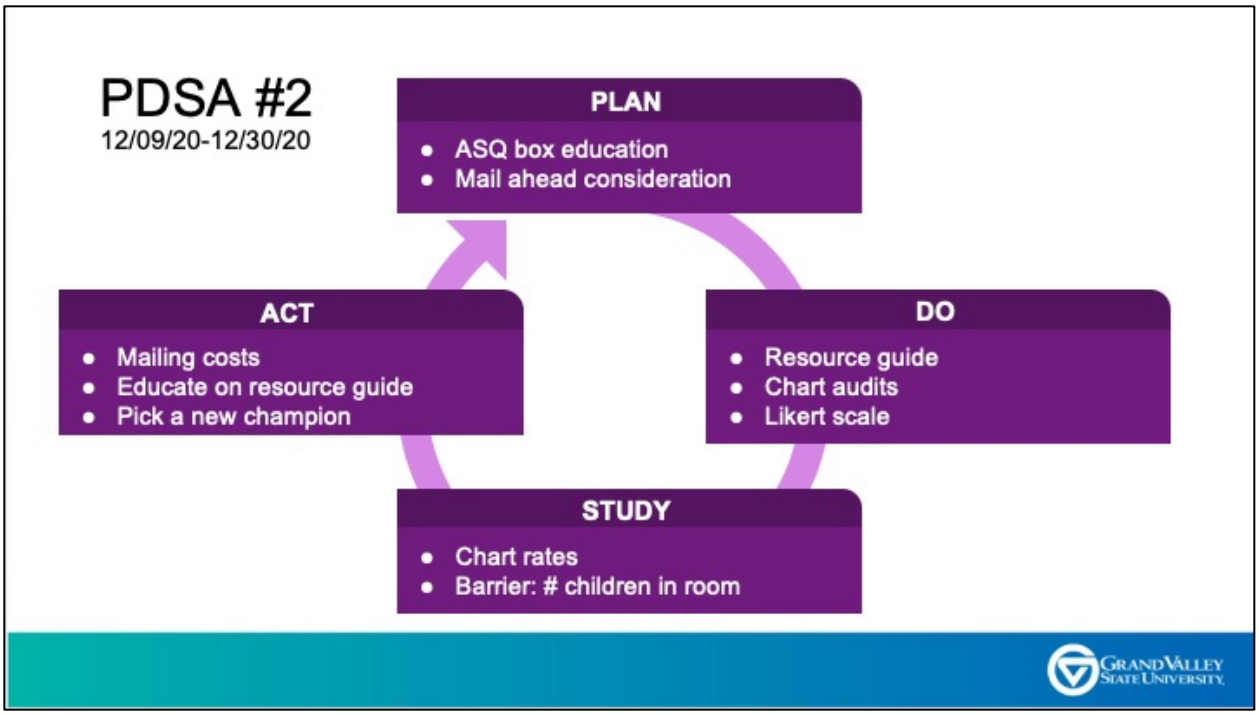
- Dissemination- Journal of Pediatric Health Care

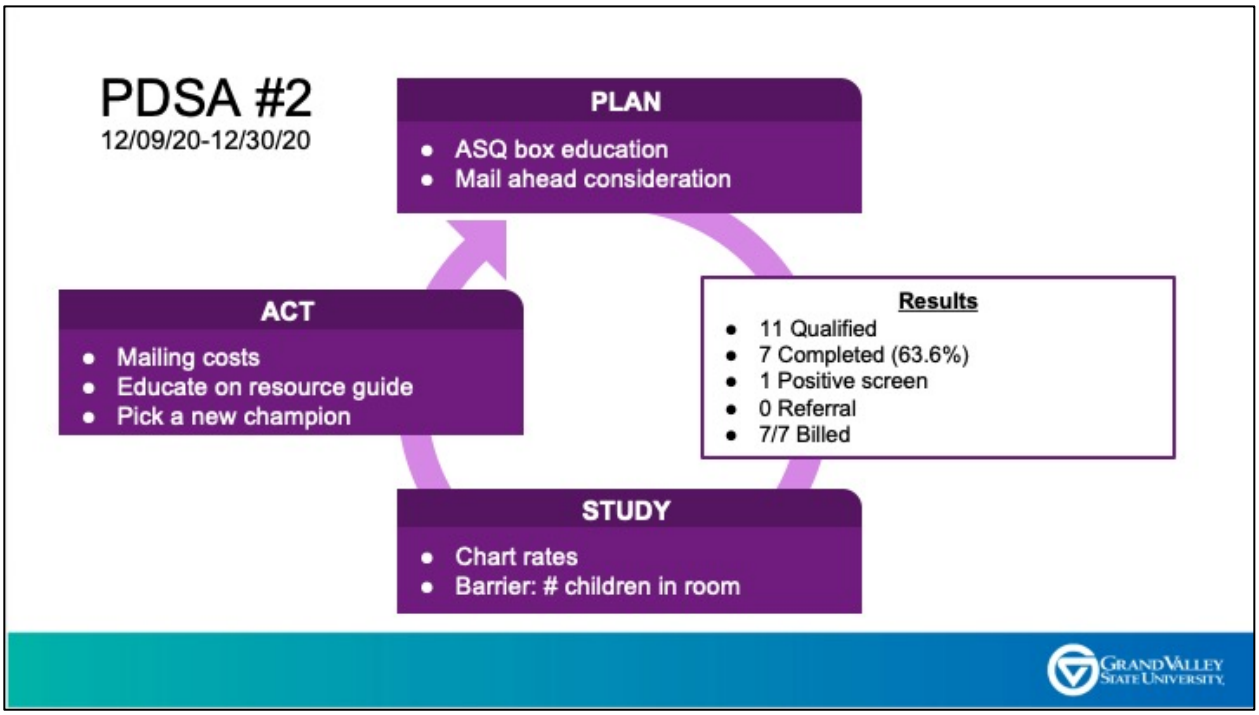
April 2021

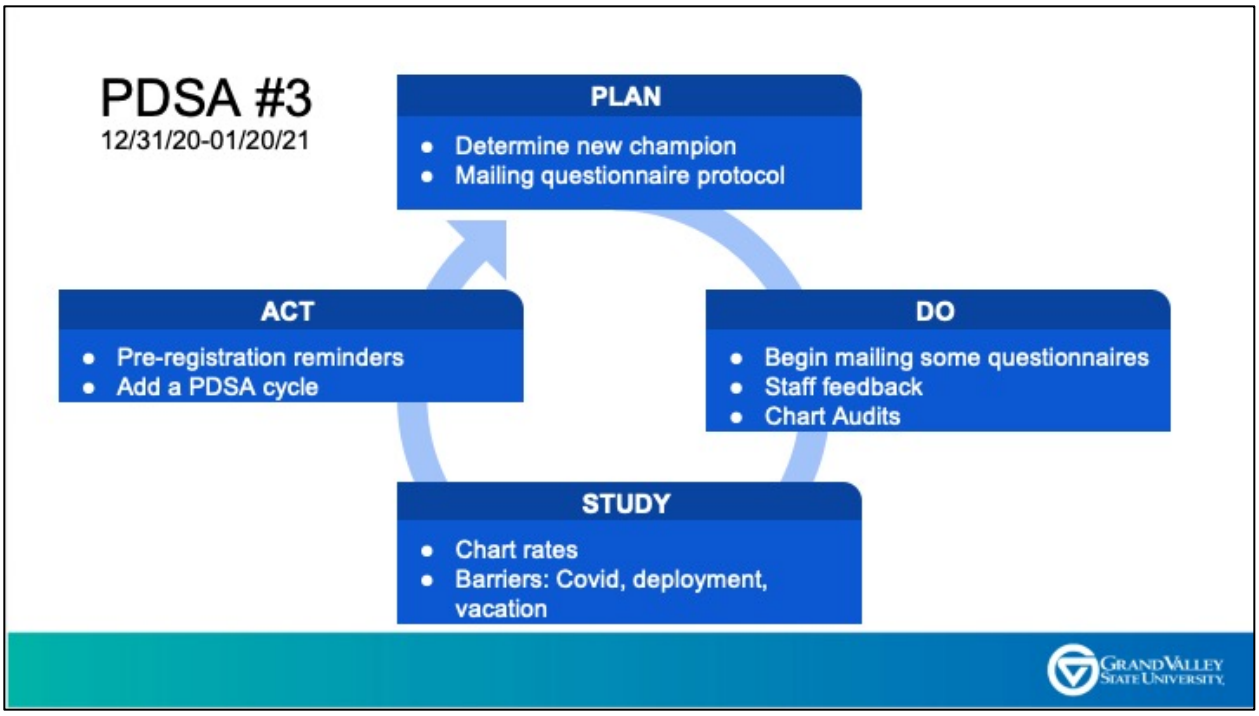
- Graduation

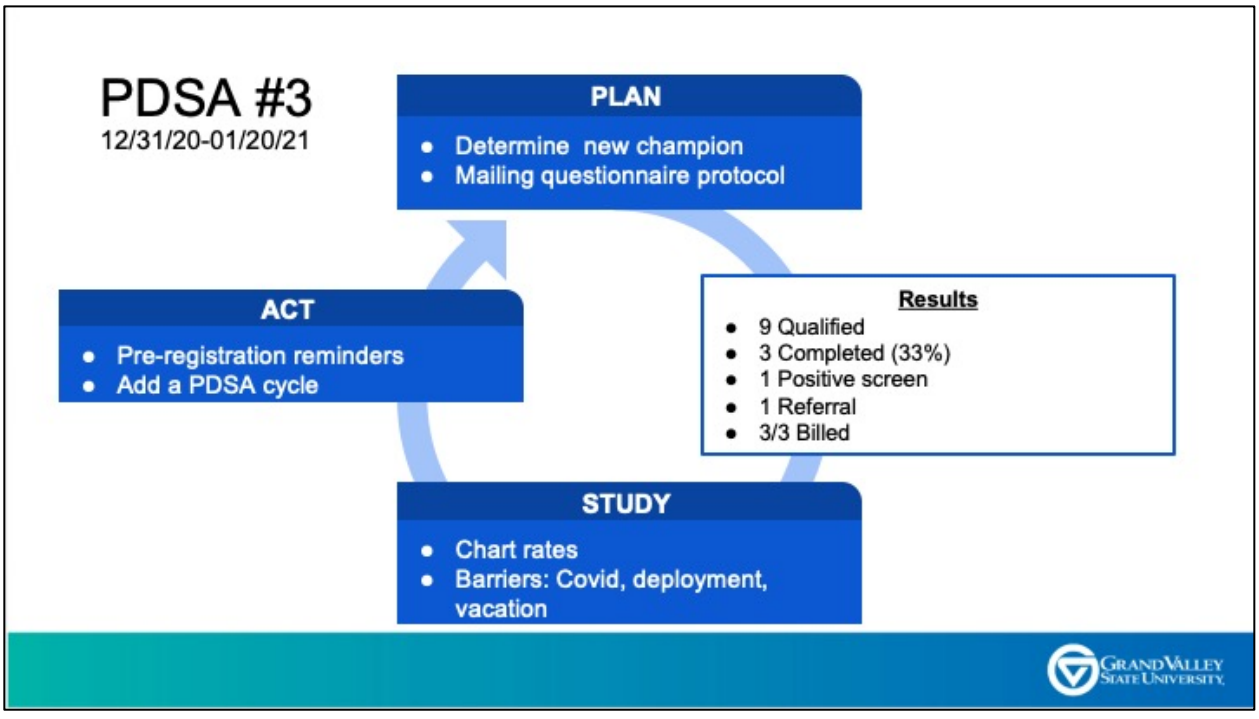

PDSA #1
11/18/20-12/08/20
(10/24/20)
PLAN
Initial materials
DO
Staff engagement
Audit charts
ASQ boxes
STUDY
Capture rates
Barrier: Covid, deployment
ACT
Create new and edit initial materials
Champion
Grand Valley State University


PDSA #1
11/18/20-12/08/20
(10/24/20)
PLAN
Initial materials
Results
15 Qualified
5 Completed (33%)
1 Positive screen
1 Referral
5/5 Billed
STUDY
Capture rates
Barrier: Covid, deployment
ACT
Create new and edit initial materials
Champion
Grand Valley State University


PDSA #2
12/09/20-12/30/20
PLAN
ASQ box education
Mail ahead consideration
DO
Resource guide
Chart audits
Likert scale
STUDY
Chart rates
Barrier: # children in room
ACT
Mailing costs
Educate on resource guide
Pick a new champion
Grand Valley State University


PDSA #2
12/09/20-12/30/20
PLAN
ASQ box education
Mail ahead consideration
Results
11 Qualified
7 Completed (63.6%)
1 Positive screen
0 Referral
7/7 Billed
STUDY
Chart rates
Barrier: # children in room
ACT
Mailing costs
Educate on resource guide
Pick a new champion
Grand Valley State University


PDSA #3
12/31/20-01/20/21
PLAN
Determine new champion
Mailing questionnaire protocol
DO
Begin mailing some questionnaires
Staff feedback
Chart Audits
STUDY
Chart rates
Barriers: Covid, deployment, vacation
ACT
Pre-registration reminders
Add a PDSA cycle
Grand Valley State University


PDSA #3
12/31/20-01/20/21
PLAN
Determine new champion
Mailing questionnaire protocol
Results
9 Qualified
3 Completed (33%)
1 Positive screen
1 Referral
3/3 Billed
STUDY
Chart rates
Barriers: Covid, deployment, vacation
ACT
Pre-registration reminders
Add a PDSA cycle
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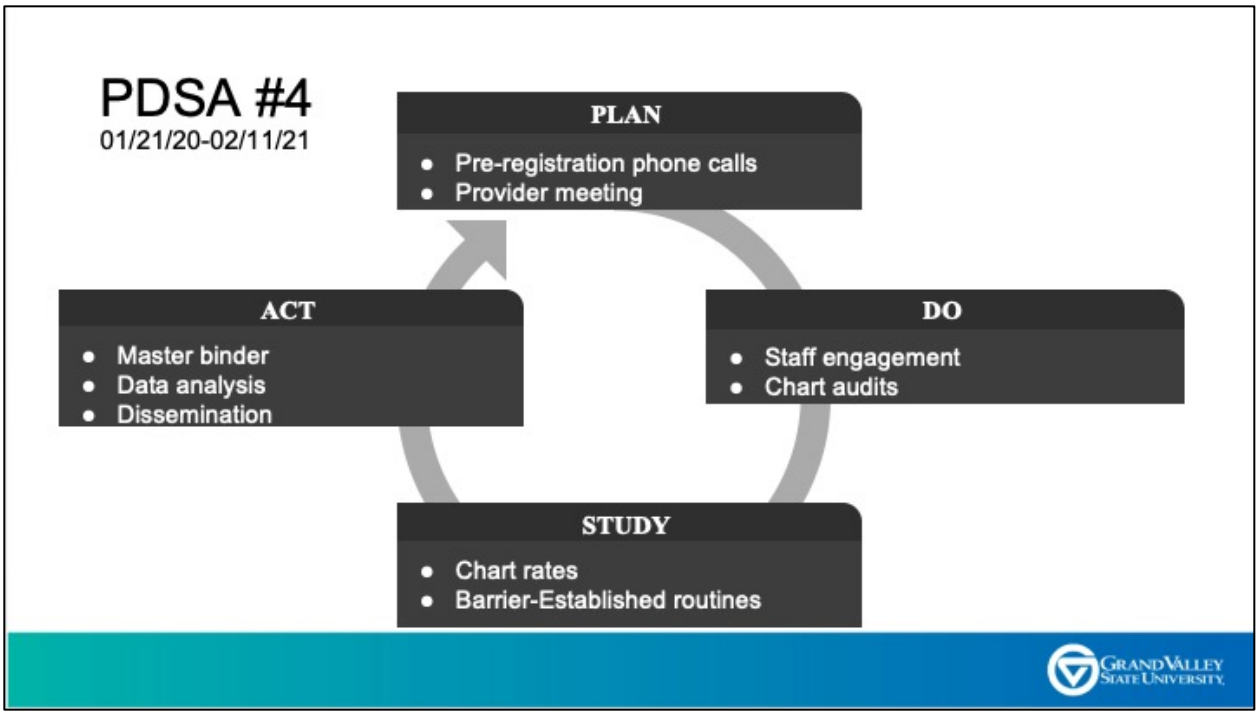
PDSA #4
01/21/20-02/11/21
PLAN
Pre-registration phone calls
Provider meeting
DO
Staff engagement
Chart audits
STUDY
Chart rates
Barrier-Established routines
ACT
Master binder
Data analysis
Dissemination
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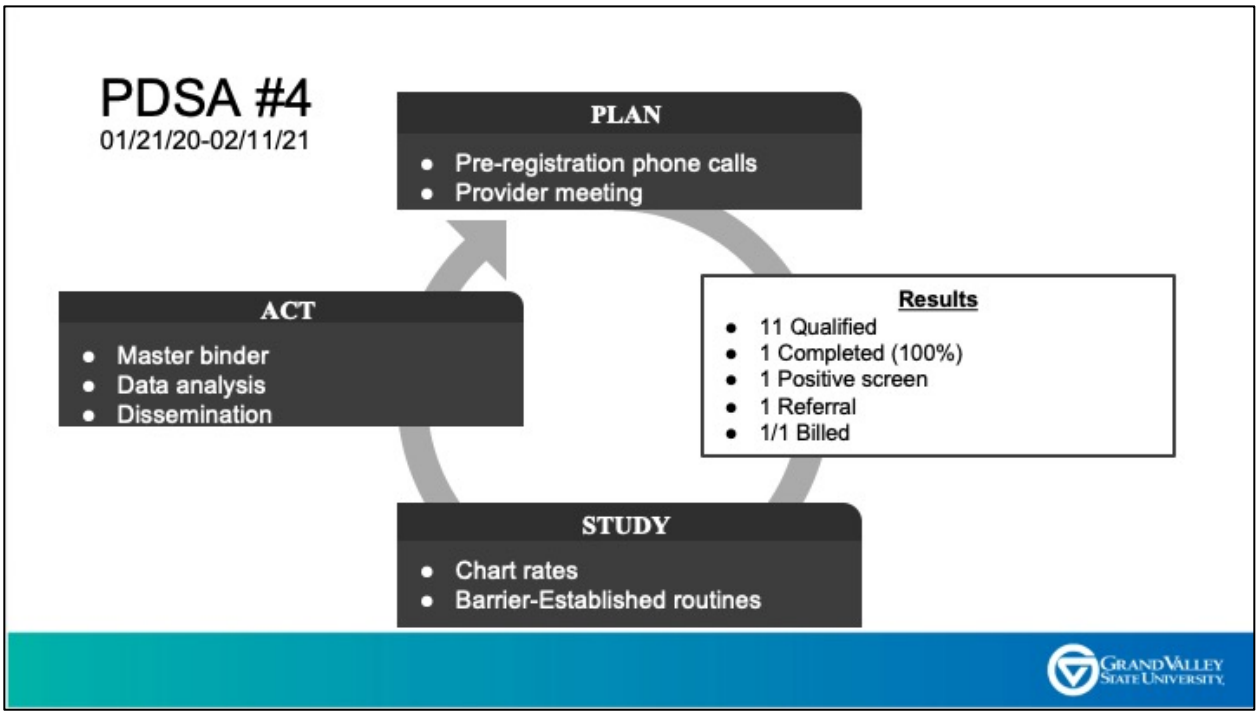
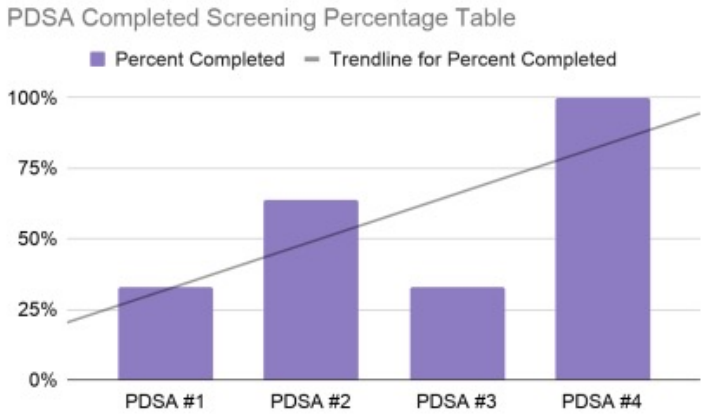
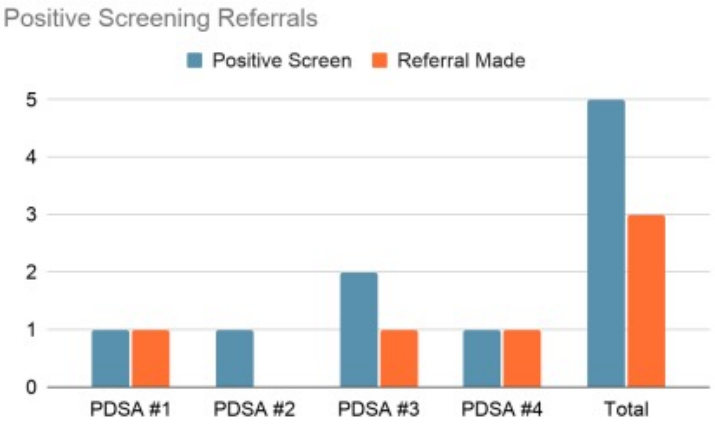

PDSA #4
01/21/20-02/11/21
PLAN
Pre-registration phone calls
Provider meeting
Results
11 Qualified
1 Completed (100%)
1 Positive screen
1 Referral
1/1 Billed
STUDY
Chart rates
Barrier-Established routines
ACT
Master binder
Data analysis
Dissemination
Grand Valley State University

PDSA Cycle Counts Chart

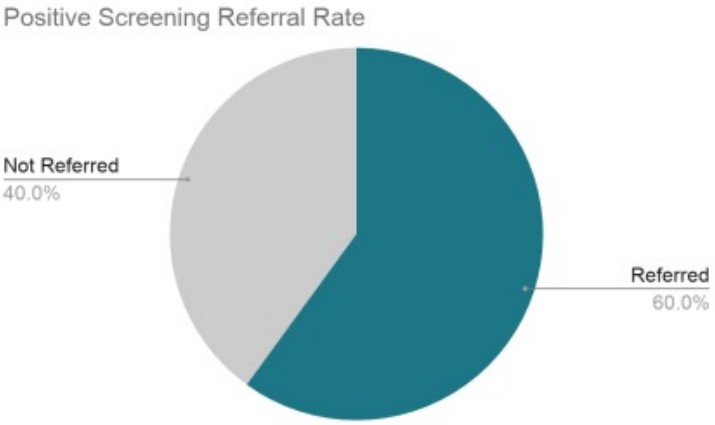
PDSA Completed Screening Percentage Chart



PDSA Referral Count Chart



Positive Screening Referral Rate



Statistical Analysis

Fisher's Exact Test

Hypotheses:

H_0: developmental screening and developmental delay identification are independent variables

H_1: developmental screening and developmental delay identification are *not* independent variables

Fisher's Exact Test: Two Tailed

	Developmental Delay Identified	Developmental Delay NOT Identified	Total
PRE Screening Implementation	0	29	29
POST Screening Implementation	5	31	36

Two-tailed p value: **0.060019**

Cannot reject the null hypothesis, but *marginally* statistically significant for variable association.

Data Collection: System Outcomes

Topic	Concept	How Measured	When Measured	Who Measures
System outcomes	Billables from developmental screening	EHR Audit: CPT code 96110	Pre-implementation; with each PDSA cycle; post implementation (February 2021)	Student

Budget: Revenue

Generated funds from developmental screening	
1 developmental screening CPT charge	$10.58 (average)
16 developmental screening CPT charges	$169.28

Budget Expenses: Proposed vs. Actual

Expenses for Implementation of Project	
ASQ License – one time fee (English, Spanish, User Guide, tax)	$567.10
M-CHAT License	$0.00
MA Time (10 minutes per patient)	$2.48
DNP Student (50 hour in-kind donation)	($2,250.00)
Physician Site Mentor (10 hour in-kind donation)	($1,000.00)
Supplies (paper, lamination, ring, dry erase markers, 45 mailed)	$32.24
Meetings	($50.00)
Total	**$605.82**

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Budget Expenses: Proposed vs. Actual

Expenses for Implementation of Project	
~~ASQ License – one time fee (English, Spanish, User Guide, tax)~~	~~$567.10~~
M-CHAT License	$0.00
MA Time (10 minutes per patient)	**$39.68**
DNP Student (50 hour in-kind donation)	($2,250.00)
Physician Site Mentor (10 hour in-kind donation)	($1,000.00)
Supplies (paper, lamination, ring, dry erase markers, 45 mailed)	**$109.70**
Meetings	($50.00)
Total	**$149.38** **25%**

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Finalized Budget

Revenue	$169.28
Total Expenses	$149.38

Timeline to break even	9 weeks (15 screenings)
Revenue opportunity with 100% (36 screenings)	$380.88
Estimated project profit through February	$19.90

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Room for Improvement

- Recommendation: Use corrected age until 2 years old
- ASQ: Full term 39 weeks
- Project results:
  - ⅗ delays were 24 months old
  - ⅖ delays were 18 months old
- Closer assessment in the future

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Sustainability

- Majority of staff buy-in
- Champion: Michelle
- Reimbursement
- Ease of use in EHR
- Rural Health Clinic requirements

DNP Essentials

1. Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking
2. Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice
3. Essential VII: Clinical Prevention and Population Health for Improving the Nation's Health
4. Essential VIII: Advanced Practice Nursing

Summary

- High confidence in education and adaptability
- Developmental delay identification improved
- Several barriers will need ongoing addressment
- Sustainability likely outweighs the barriers
- Future opportunity for referral improvement

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Handouts

1. Literature Review
2. QI Packet
3. Reminder Flyers
4. Billing reminder
5. Resource guide
6. Data Collection

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Questions?