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Promoting Autism Spectrum Disorder Evidence-Based Care: Protocols for Assessment, Specialty Referral, and Documentation

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Understanding Autism Spectrum Disorder

Prevalence & Scope

- ASD affects 1 in 31 U.S. children (CDC, 2025)
- Impacts communication, behavior, and social interaction

Management

- Interventions: behavioral, speech, and occupational therapies
- Medications help with co-occurring conditions (e.g., anxiety, ADHD)

System Impact

- Impacts patients, families and healthcare system
- Emphasizes need for coordinated, evidence-based care



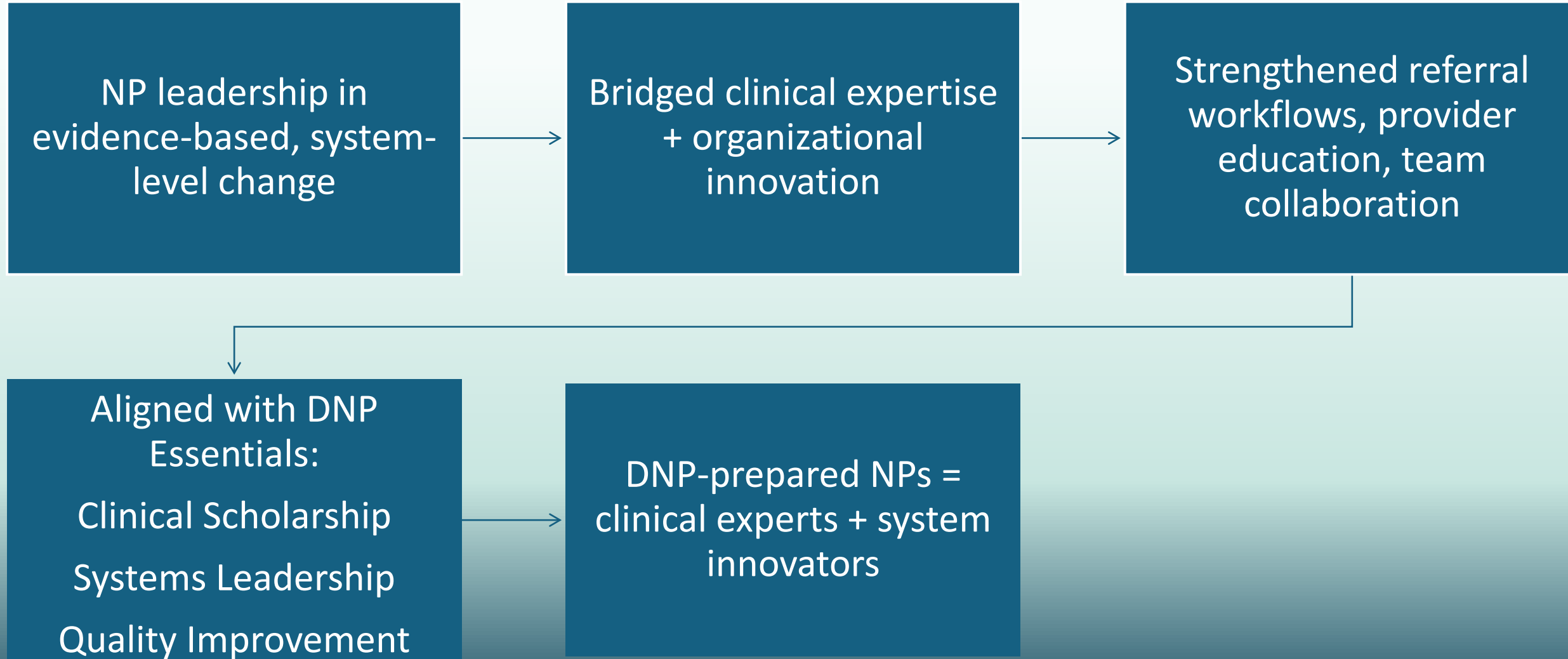
Problem Statement and Objectives

There is a **gap in consistent autism spectrum disorder (ASD) assessment, referral and documentation processes** in the outpatient clinic, resulting in delayed, fragmented care and suboptimal outcomes.

Project Objectives

1. Identify existing gaps in ASD assessment, documentation and referral practices.
2. Implement provider education on evidence-based ASD care.
3. Verify community and state ASD resources and introduce standardized electronic documentation and resource guide.
4. Evaluate outcomes through chart audit, pre/post test and feedback surveys.

Relevance to Nurse Practitioner Role





Background and Significance

What We Know

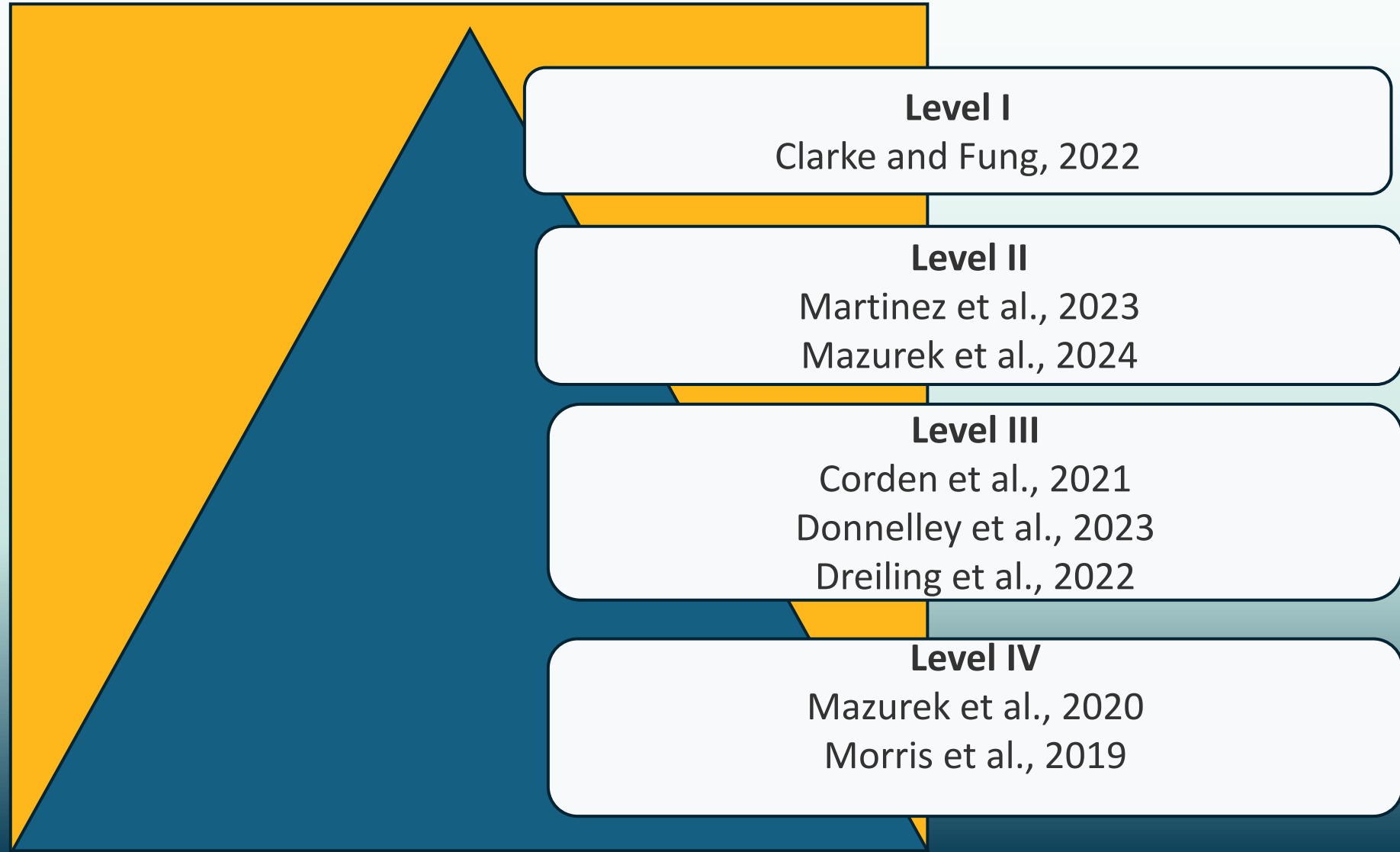
- ASD prevalence has increased from 1 in 44 (2018) to 1 in 31 (2022)
- Co-occurring medical and behavioral conditions complicate management
- Primary-care providers often first to identify developmental concerns
- Early, coordinated intervention improves outcomes and family support

Why It Matters to Quality Improvement (QI)

- Inconsistent documentation and referrals delay timely care
- Addressing gaps in knowledge and standardizing workflow aligns with IOM domains of effectiveness, timeliness, efficiency, patient-centeredness
- Supports system-level QI to improve equitable access to ASD care



Literature Review





Summary of Literature Review Findings





Educational Models: Bridging the Evidence-to-Practice Gap

ATTAIN NAV (Access to Tailored Autism Integrated Care through Family Navigation)

- Co-designed by Nicole Stadnick with caregivers and health partners
- Delivered by trained lay navigators using motivational interviewing and collaborative goal setting to connect families to mental health and community resources
- Focus: Family support and resource linkage (not direct provider training)

Project ECHO (Extension for Community Healthcare Outcomes)

- Developed by clinicians at the University of New Mexico
- Utilized a hub-and-spoke tele-mentoring model linking specialists (hub) with community-based providers (spokes)
- Focus: Building provider knowledge, self-efficacy, and clinical decision-making through ongoing mentorship and case-base learning



Evidence-Based Rationale for Selecting the ECHO Model

Strong alignment with project goals and directly addressed provider, workflow, and referral gaps

Supported by one Level II study (Mazurek et al., 2024) and two Level III studies (Dreiling et al., 2022) and Level IV (Mazurek et al., 2020)

Mentorship and case-based learning strengthened real-world application and provider self-efficacy

Promotes sustainable clinical change in ASD assessment, referral, and documentation the three pillars of this project

Builds long-term capacity by forming a collaborative community of practice that supports ongoing learning

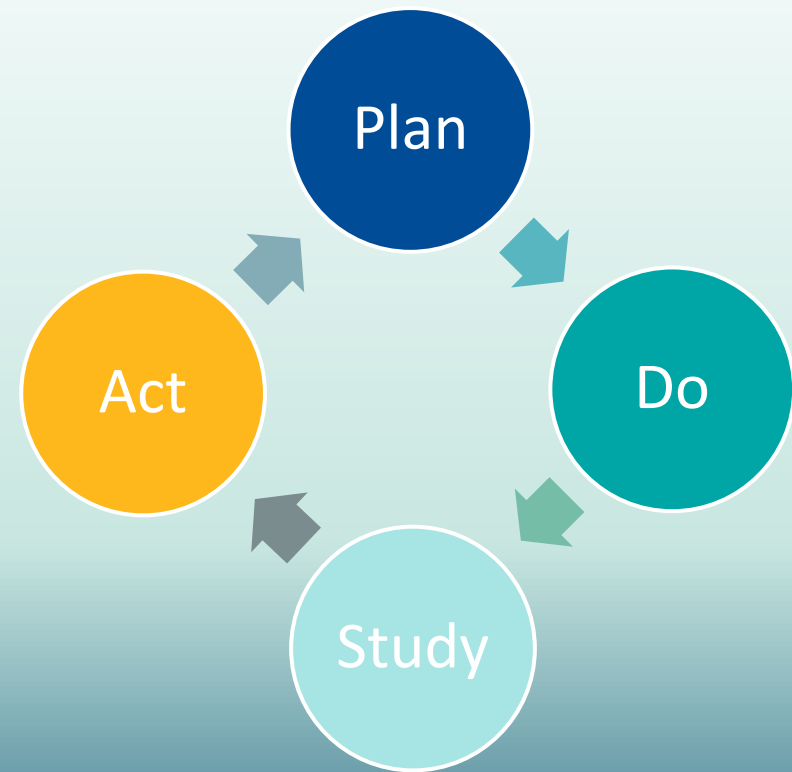
Theoretical Framework: Plan–Do–Study–Act (PDSA) Model

The PDSA model supports iterative learning, small-scale testing, and continuous refinement based on real-world data.

Allows for testing changes on a small scale, analyzing results, and adapting the approach based on real-world data.

- **Plan:** Identify ASD workflow gaps and design interventions
- **Do:** Implement education and documentation protocols
- **Study:** Evaluate outcomes through data and feedback
- **Act:** Refine and sustain successful processes

PDSA Model for Improvement



Derived from Shewhart Cycle (1939) and refined by W. Edwards Deming (1986)



Methods

Design

- Quasi-experimental pre-test/post-test quality improvement design
- Randomization not feasible or ethical in a clinical setting
- Direct comparison of provider knowledge, confidence, and practice before and after the intervention

Setting

- Conducted in a multidisciplinary outpatient clinic in central Maryland
- Clinic integrates primary care and mental health services, serving autistic patients within the community
- Ideal environment for implementing and sustaining ASD evidence-based care protocols

Participants

- Six nurse practitioners (N=6) employed at the clinic, recruited via convenience sampling
- Roles: two full-time, two part-time, one float, one weekend provider
- Background: four family NPs and two psychiatric NPs, aged 25–58
- All had prior experience managing patients with ASD



Data Collection Tools

Demographic Data Tool

- Collected quantitative data on six participant before intervention including characteristics such as age, specialty, and experience
- Provided context for interpreting outcomes

Chart Audit Tool

- Quantitative data evaluating assessment, referral and documentation practices
- Administered before and after interventions
- Process and outcome measure

Pre- and Post-Test Surveys

- Quantitative data measuring provider knowledge and confidence
- Before and immediately after the intervention
- Process and outcome measure

Feedback Survey Tool

- Quantitative and qualitative data to assess satisfaction, perceived relevance, and barriers.
- After intervention
- Outcome measure of intervention usefulness and sustainability



Core Interventions

Shareholders

- This quality improvement initiative relied on collaboration with organizational leaders, EHR staff, and community agencies
- Collaboration ensured feasibility, sustainability and alignment with project goals

The core interventions represented structured practice changes consistent with evidence and American Academy of Pediatrics (AAP, 2020)

ECHO Autism Training

- Zoom-based didactic teaching, case discussions, and interactive learning.
- Strengthened NP knowledge, confidence, and competence in ASD screening, assessment, and referral

EHR-Embedded ASD Resource Guide

- Verified Maryland and statewide resources (Early Intervention, Autism Waiver, Autism Program Planning Success for Employment and Pathfinders for Autism)
- Supported accurate referrals, efficient coordination, and consistent documentation

Standardized Referral Workflow

- EHR-integrated steps for confirming concerns, using ASD checklist, initiating referrals, documenting caregiver engagement, and assigning follow-ups
- Streamlined workflow and improved coordination between providers, families, and community resources



Procedures

PDSA Cycle 1

Plan (7 months)

- Collaborated with clinic director to present project concept and identify workflow gaps
- Revealed inconsistencies in ASD screening, referral, and documentation
- Completed literature appraisal (Nov 2024), proposal defense (Dec 2024), and IRB approval (Feb 2025)
- Developed intervention and data collection tools: demographic, pre/post, feedback, and chart audit tools; EHR-embedded ASD Resource Guide and Standardized Referral Workflow

Do (2 months)

- Recruited 6 NPs (Mar 2025); signed informed consent
- Collected demographic and pre-test survey data, enrolled in ECHO training session
- Integrated tools into HER; conducted retrospective audit of 23 ASD charts
- Coordinated first ECHO Autism training (Mar & Apr 2025)
- Activated workflow for use in the EHR and collected post-test and feedback surveys

Study (2 months)

- Analyzed data using descriptive statistics for changes in knowledge, confidence, and documentation
- Ensured data accuracy and anonymity through coding and manual review

Act (1 month)

- Identified need to shorten training sessions for workflow efficiency and enhanced engagement.



Procedures

PDSA Cycle 2

Plan (1 month)

- Refined intervention based on Cycle 1 feedback; shorter ECHO sessions and added EHR support
- Ensured enrollment in second ECHO training session

Do (1 month)

- Implemented revised training (30 min + 15 min demo)
- Reinforced workflow use
- Collected post-test, feedback surveys and completed post training audits of 14 ASD charts

Study (2 months)

- Used descriptive statistics to compare Cycle 2 vs. Cycle 1 results
- Strengthened confirmability through member checking

Act (1 month)

- Created sustainability plan



Protection of Human Subjects



Institutional Review Board (IRB) approval was obtained in February 2025; the project was classified as an exempt quality improvement initiative.



Participation was voluntary with written informed consent.



No direct patient participation; only de-identified retrospective chart audit data were used.

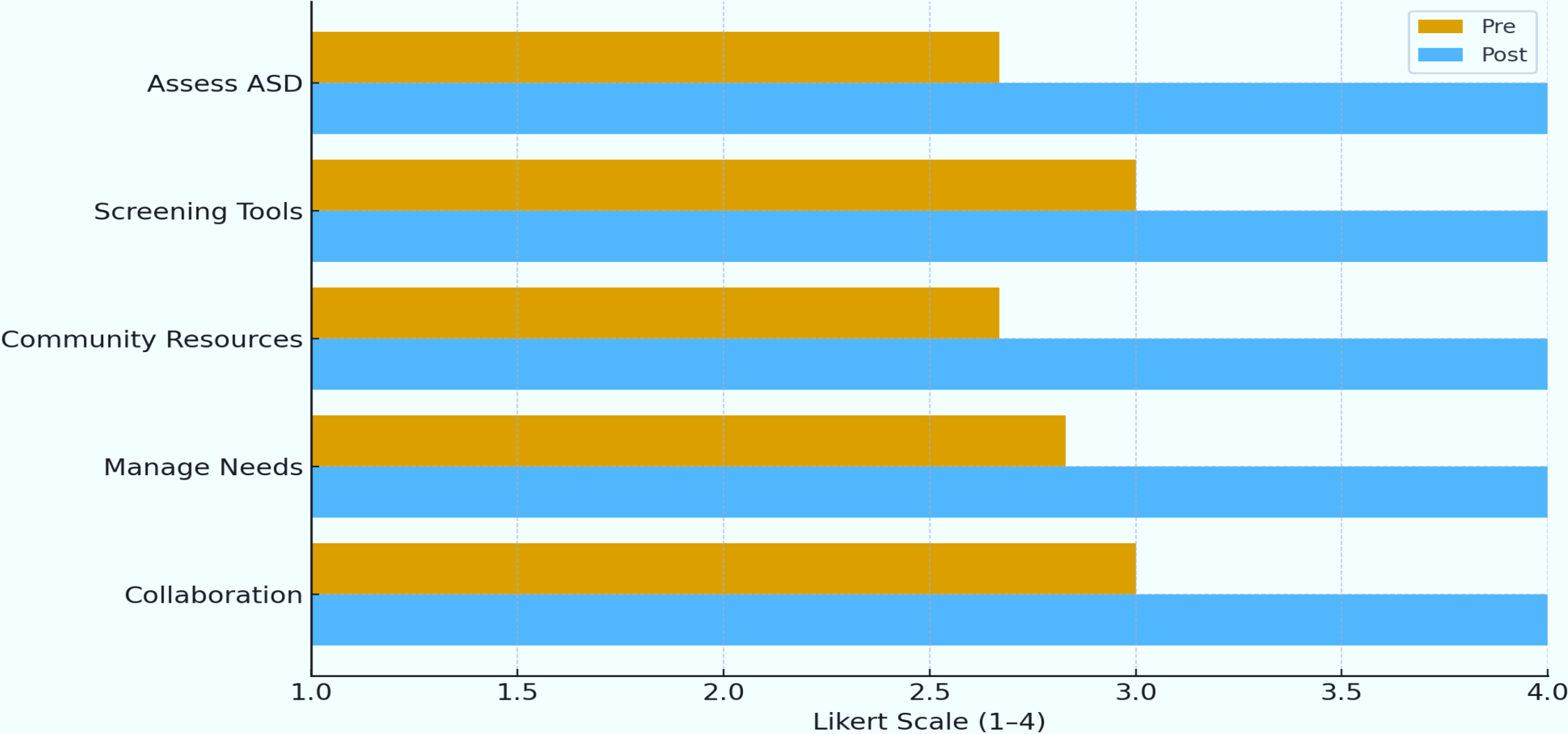


Confidentiality was maintained through secure data storage, and all data were reported in aggregate.



Results Overview

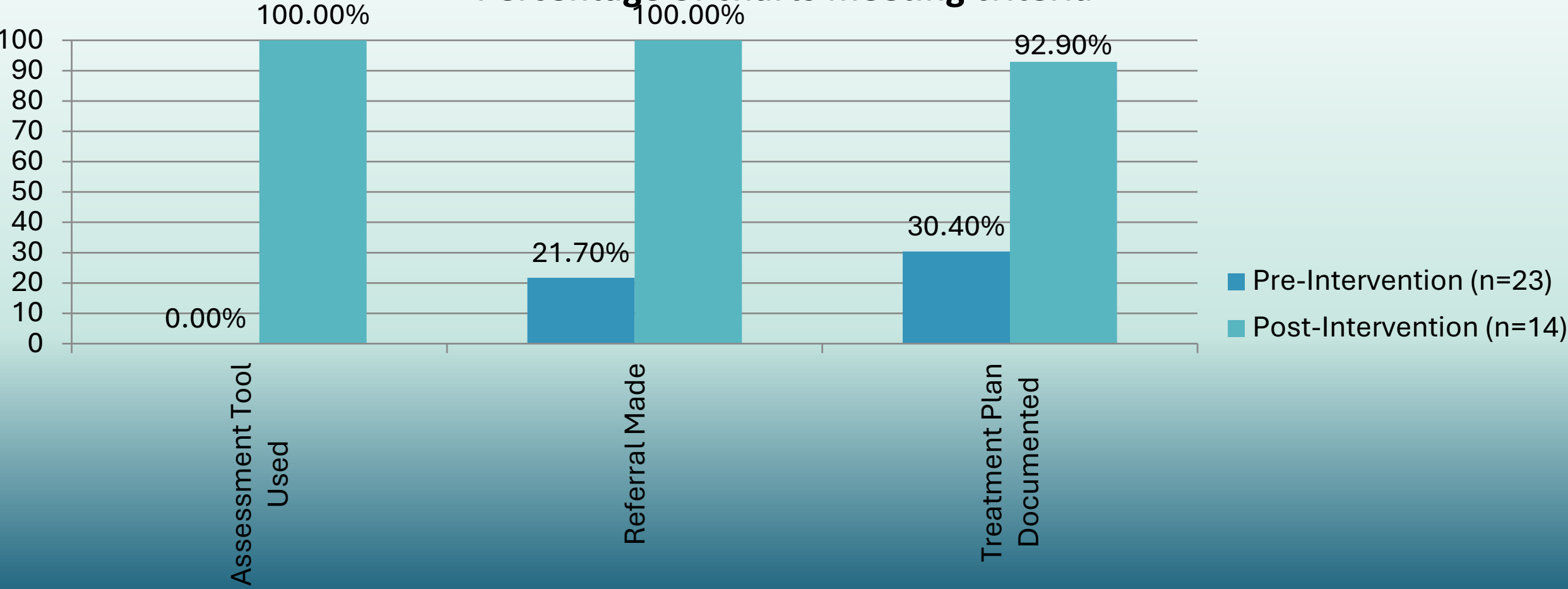
Pre-Post Results (Scaled 1-4)





Quantitative: Transformation of Clinical Practice (Chart Audit)

Clinical Practice Change: Pre- vs. Post-Intervention
Percentage of charts meeting criteria





Qualitative: Provider Feedback Themes



Thematic analysis of open-ended survey responses provided context for the quantitative results.



Relevance to Practice: Participants consistently described the training as "educative" and "very informative".



Positive Experience: General feedback was highly positive, with comments like "great training" becoming more frequent after adjustments were made.



PDSA in Action: Shortened second training in response to feedback leading to higher reported satisfaction and demonstrated effectiveness of the iterative improvement model.



Dissemination

Agency Level

- Share results with clinic leadership and the QI team
- Support continued adoption of the EHR workflow, resource guide, and ECHO training

Community Level

- Present findings to local autism networks and partner agencies
- Strengthen coordinated care pathways across community organizations

National Level

- Disseminate through conferences and professional organizations
- Submit the project to a peer-reviewed journal to support broader ASD care improvements



Economic Impact

Implementation Costs

- NP Wage Basis: \$61/hour (Maryland average)
 - ECHO Autism Training (2 sessions): \$1,100
 - EHR Workflow Build: \$370
 - Administrative & Technical Setup: \$300
 - Annual Maintenance: \$180
- Total Implementation Cost: \$1,950**

Conclusion: Annual benefits (\$17,414) far exceed the implementation cost (\$1,950), demonstrating that the intervention is cost-effective, financially sustainable, and supportive of long-term practice improvement.

Annual Benefits

- Increased Efficiency:
 - 10 minutes saved per visit × 6 visits/year × 23 patients
 - Provider time savings: \$1,406
 - Reduced Emergency Department Use:
 - 16% reduction linked to structured ASD protocols
 - Savings: \$2,208
 - Reduced Service Intensity:
 - 2% decrease in high-cost ASD services
 - Savings: \$9,200
 - Improved Care Coordination:
 - 1 day less caregiver work-loss per family
 - Savings: \$4,600
- Total Annual Benefits: \$17,414**



Plans For Sustainability



Integrate into Practice:
Embed ASD tools in the EHR and clinic policy



Ongoing Education:
Continue ECHO sessions and annual provider refreshers



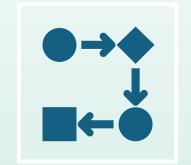
Leadership & Oversight:
Maintain an NP Champion and regular QI review



Monitor Progress:
Use chart audits and feedback to guide improvement



Community Partnerships:
Collaborate with advocacy groups and payers for support



Continuous Adaptation:
Conduct annual PDSA reviews and expand successful workflows



Project Strengths and Limitations

Project Strengths

- Combined ECHO Autism education + standardized EHR workflow
- 100% NP participation and strong leadership support
- Clear, measurable improvements in assessment, referral, and documentation
- Interprofessional collaboration improved care coordination
- PDSA cycle allowed rapid refinement and higher engagement

Project Limitations

- Single clinical site and small sample size (n = 6)
- Short post-intervention window; long-term sustainability unknown
- Workflow designed for one specific EHR; limited transferability
- Training required protected time, which may be difficult in busy settings
- No patient-level outcomes measured



Leadership, Contributions to Advanced Practice Nursing, & Collaboration

- **Project Lead (DNP Student):** Directed project design, literature review, EHR workflow creation, training coordination, data collection, and evaluation.
- **Clinic Leadership:** Supported project adoption, approved workflow integration, ensured protected training time.
- **Nurse Practitioners:** Participated in training, applied assessment tools, referrals, and documentation changes.
- **Stakeholders:**
 - Medical Assistants & Admin Team Assisted with referrals, family follow-up, and scheduling.
 - IT/EHR Support: Integrated standardized templates and resource guide.
 - Community Agencies: Provided verified resources for referrals.
- **Advanced Practice Nursing Impact:** Improved evidence-based assessment, coordinated care, and standardized documentation for ASD patients.

Questions?

**Promoting Autism Spectrum Disorder Evidence Based Care: Protocols for Assessment,
Specialty Referral and Documentation**

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November 30, 2025

Abstract

Autism Spectrum Disorder (ASD) affects approximately 1 in 31 children in the United States and requires coordinated, evidence-based assessment and referral practices to support developmental outcomes. At the participating outpatient clinic in central Maryland, nurse practitioners were not using standardized ASD assessment tools, demonstrated variable referral patterns, and had incomplete documentation, contributing to fragmented care and delayed access to services. The purpose of this quality improvement project was to enhance provider knowledge, confidence, and consistency in ASD assessment, specialty referral, and documentation practices. This project was guided by the Plan–Do–Study–Act (PDSA) framework. Six nurse practitioners participated in a structured intervention. Data was collected through provider surveys, chart audits, and qualitative feedback. Quantitative results were summarized using descriptive statistics, and qualitative comments were analyzed thematically. The intervention included two ECHO Autism training sessions and implementation of a standardized electronic health record workflow incorporating an ASD community resource guide and referral workflow template. Provider confidence increased across all clinical domains, with all participants reporting high confidence following the intervention. Chart audits demonstrated improvements in practice: use of assessment tools increased from 0% to 100%, referrals from 21.7% to 100%, and documentation completeness from 30.4% to 92.9%. Participants reported high satisfaction and strong perceived relevance of the intervention. Integrating ECHO Autism education with a standardized workflow improved provider competence and care coordination, supporting sustainable, consistent, and equitable ASD care in primary care settings.

Keywords: Autism Spectrum Disorder, Quality Improvement, ECHO Autism, Plan–Do–Study–Act, Nurse Practitioner, Evidence-Based Practice, Care Coordination, Standardized Protocols

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Promoting Autism Spectrum Disorder Evidence Based Care: Protocols for Assessment, Specialty Referral and Documentation

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition marked by persistent challenges in social communication, restricted interests, and repetitive behaviors that typically appear in early childhood (American Psychiatric Association [APA], 2024). Some individuals with ASD experience co-occurring conditions such as attention-deficit/hyperactivity disorder (ADHD), anxiety, sleep, and gastrointestinal disturbances (Maenner et al., 2023). Although ASD has no cure, evidence consistently demonstrates that early identification and individualized, coordinated care significantly improve developmental, behavioral, and adaptive outcomes (Hyman et al., 2020; CDC, 2025). Given the complexity and lifelong nature of ASD, ongoing multidisciplinary management is essential to address developmental and medical needs across the lifespan. Within primary care settings, nurse practitioners (NPs) are uniquely positioned to support this continuum of care by facilitating early recognition, conducting structured assessments, initiating timely referrals, and ensuring consistent documentation.

Incidence and Prevalence

ASD is among the most common neurodevelopmental disorders in the United States and continues to rise in prevalence. Current national CDC surveillance estimates for 2022 show that approximately 1 in 31 children have a diagnosis of ASD with a notable increase from 1 in 44 in 2018 (CDC, 2025). This trend reflects improved diagnostic awareness, expanded screening, and better access to developmental assessment. Revisions to diagnostic frameworks and improved screening have broadened the identification of ASD. Gallin et al. (2024) noted that successive editions of the Diagnostic and Statistical Manual of Mental Disorders have expanded the range of behaviors associated with ASD from the narrow definition in the DSM-III-R (American

Psychiatric Association [APA], 1987) to the unified spectrum approach introduced in the DSM-5 (APA, 2013; 2024). Enhanced screening guidelines, such as the American Academy of Pediatrics' recommendation for standardized screening at 18 and 24 months, have advanced early detection (Gallin et al., 2024). The inclusion of ASD in the Individuals with Disabilities Education Act (1990) also increased access to evaluation through school-based services. Despite these advances, ASD requires consistent and coordinated management across the lifespan to support developmental progress, reduce healthcare costs, and enhance family well-being.

Contributing Factors and Barriers

Although diagnostic frameworks and screening practices for ASD have improved, variability in clinical implementation continues to create inconsistencies in care. The Centers for Disease Control and Prevention (CDC, 2025) recommend that children and adolescents with ASD receive evidence-based behavioral, educational, and family-centered interventions such as applied behavior analysis (ABA), speech, occupational therapy, and parent training to enhance communication, adaptive functioning, and overall development. However, many primary care settings lack standardized workflows to operationalize these recommendations in daily practice. Differences in provider training, limited familiarity with validated tools, and the absence of structured documentation processes contribute to gaps in assessment, delayed referrals, and fragmented follow-up care.

Knowledge and confidence gaps among primary care providers further compound these systemic challenges. Studies have shown that many providers feel underprepared to identify, manage, and coordinate services for individuals with ASD (Mazurek et al., 2020; Morris et al., 2019). Limited knowledge of community resources and lack of experience with standardized diagnostic instruments and behavioral management strategies contributed to inconsistent

screening practices and missed opportunities to implement standardized assessment, referral, and documentation practices within the participating clinic (Corden et al., 2021). Practical barriers such as time constraints, high patient volumes, and inadequate reimbursement further impede comprehensive evaluation and multidisciplinary collaboration (Mazurek et al., 2020; Morris et al., 2019). Collectively, these systemic and provider-level factors contribute to delays in diagnosis, fragmented coordination, and inequitable access to evidence-based care.

Consequences

Failure to identify and coordinate appropriate ASD services has far-reaching implications for patients, families, and healthcare systems. Children with ASD typically require approximately six outpatient visits annually, often lasting 45 minutes compared with 15–20 minutes for neurotypical peers (Hand et al., 2021). This reflects inefficiencies caused by inadequate assessment, referral, and follow-up. Delayed access to early intervention services can limit communication and adaptive skills, reducing long-term independence (Daniolou et al., 2022). Fragmented care also drives crisis-based utilization; structured ASD protocols and enhanced coordination have been shown to reduce emergency-department visits by 16 percent, producing measurable cost savings and improved outcomes (Huang & Saint Onge, 2025). Beyond the clinical implications, the national economic impact of ASD is substantial. Schmid et al. (2020) estimated the U.S. economic burden of ASD at \$268 billion in 2015, with projections reaching \$461 billion by 2025, while family caregivers particularly mothers often experience reduced employment and financial strain (Gross et al., 2021; Cidav et al., 2012).

Project Purpose and Objectives

Project Purpose

Within the integrated outpatient clinic in Central Maryland where this project was conducted, nurse practitioners (NPs) provide comprehensive primary and mental healthcare to a diverse population of patients with a diagnosis of autism spectrum disorder (ASD). However, chart reviews revealed inconsistent documentation of ASD-related assessments, referrals, documentation, and follow-up care. NPs reported uncertainty about referral pathways and limited familiarity with community-based resources such as speech and occupational therapy, educational evaluations, respite care, and transition-to-adulthood programs. The electronic health record (EHR) system lacked ASD-specific prompts or integrated resource links, leading to fragmented communication and delayed interventions. Recognizing these gaps, organizational leadership demonstrated readiness for change and supported the integration of an evidence-based EHR workflow in combination with an educational intervention to improve knowledge and confidence and standardize assessment, referral, and documentation practices.

Guided by the Plan–Do–Study–Act (PDSA) framework, the project implemented the Extension for Community Healthcare Outcomes (ECHO) Autism model an evidence-based tele-education approach designed to enhance provider competence, confidence, and consistency in care delivery. The initiative not only provided education but also integrated workflow improvements through an EHR assessment, referral, and documentation tool to create sustainable, system-level change.

Project Objectives

Short-Term Objectives (0–6 months: Planning and Baseline Assessment)

1. Established baseline performance by conducting a six-month retrospective chart audit to determine existing ASD assessment, referral, and documentation practices among providers.
2. Identified system and resource needs by identifying available local and web-based community resources for ASD to be integrated into the clinic's EHR referral workflow.
3. Assessed provider readiness by administering a pre-intervention survey to evaluate nurse practitioners' baseline knowledge, confidence, and attitudes regarding ASD assessment, specialty referral, and documentation.
4. Educated leadership and staff by providing evidence-based briefings to the clinic administrator and participating providers on the importance of standardized ASD protocols.
5. Reviewed feasibility and reimbursement by examining the potential impact of workflow modifications on provider workload, reimbursement, and cost-effectiveness.

Intermediate Objectives (1–3 months: Intervention and Implementation)

1. Designed and integrated an EHR-embedded referral and documentation resource supporting ASD assessment, specialty referral, and care coordination.
2. Delivered provider education by implementing the ECHO Autism training program to enhance provider knowledge and confidence in evidence-based ASD care.
3. Fostered collaboration by engaging medical assistants and support staff in coordinating referrals and follow-up communication with families to ensure continuity of care.

4. Evaluated immediate outcomes through the administration of post-intervention surveys to measure changes in provider knowledge, confidence, and satisfaction following the educational intervention.

Long-Term Objectives (3–6 months: Evaluation and Sustainability)

1. Assessed practice change by conducting a post-intervention chart audit to evaluate improvements in the use of assessment tools, referral frequency, and documentation accuracy compared to baseline.
2. Evaluated training effectiveness by analyzing provider feedback surveys to assess satisfaction, applicability, and areas for continued improvement.
3. Institutionalized the process by embedding the standardized EHR referral and documentation workflow as a standing clinic policy to ensure consistent application of ASD protocols.
4. Sustained improvement through continued iterative PDSA cycles to refine the intervention, ensuring long-term adoption, ongoing education, and continued improvement in ASD care outcomes.

Relevance to Nurse Practitioner Role

Nurse practitioners (NPs) are uniquely positioned to lead quality improvement initiatives that enhance care coordination and strengthen evidence-based practices for patients with Autism Spectrum Disorder (ASD). The American Association of Nurse Practitioners (AANP, 2022) emphasizes that NPs blend clinical expertise, evidence-based decision-making, and systems-level thinking to deliver comprehensive, patient-centered care. Within this project, NPs served as

the primary change agents responsible for implementing standardized ASD assessment, referral, and documentation protocols within the electronic health record (EHR). Their leadership effectively bridged direct clinical care with system-level practice transformation, aligning with the core competencies of advanced practice nursing.

Using their broad scope of practice which includes health promotion, diagnosis, treatment, and care coordination NPs were instrumental in operationalizing evidence-based ASD workflows in the primary care setting. By embedding standardized tools for screening, referral, and documentation, they improved provider communication, reduced fragmentation, and supported consistent adherence to best-practice guidelines. This structured approach facilitated earlier recognition of developmental concerns, more timely specialty referrals, and ongoing monitoring of patient outcomes.

Aligned with the Institute of Medicine's (IOM, 2001) six domains of healthcare quality, safety, effectiveness, patient-centeredness, timeliness and equity, NP-led quality improvement initiatives such as this promote dependable, accountable, and coordinated ASD care. Through their roles in education, collaboration, and workflow redesign, NPs advanced early detection and comprehensive management for autistic patients. This leadership reflects core DNP competencies in clinical scholarship, systems leadership, and sustainable practice improvement.

Critical Appraisal of Literature

A comprehensive review of the literature was conducted to examine the evidence related to healthcare providers' knowledge, preparedness, and systemic barriers in the assessment, specialty referral, and documentation of Autism Spectrum Disorder (ASD) within primary care. The review also explored educational models and quality improvement interventions that enhanced provider knowledge and confidence. The findings from the reviewed studies provided

the empirical foundation for this project, which aimed to standardize ASD care through education, workflow redesign, and integration of evidence-based tools.

A structured search was conducted across multiple databases, including CINAHL, MEDLINE, PubMed, and the Cochrane Library. The review targeted studies published in English between 2018 and 2024 to capture the most recent developments in ASD education and practice. Search terms included combinations of “*healthcare provider knowledge*,” “*Autism Spectrum Disorder*,” “*outpatient clinic education*,” and related Boolean operators such as *AND* and *OR* to broaden or narrow the results as appropriate. Additional search terms “*referral processes*,” “*assessment*,” “*treatment*,” “*continuing education*,” “*training programs*,” and “*professional development*” were used to ensure the inclusion of studies that examined both clinical practice and educational interventions.

The search initially yielded 109 articles, distributed as follows: 56 from PubMed, 40 from CINAHL, and 13 from the Cochrane Library. After applying inclusion and exclusion criteria, eight studies were identified as relevant for critical appraisal and synthesis. Evidence levels were determined using Polit and Beck’s (2018) hierarchy, with the selected studies ranging from Level I to Level IV. These included one Level I study, two Level II studies, three level III studies and two Level IV studies. A detailed summary of each study’s evidence level is presented in Appendix A, and the synthesis of findings is provided in Appendix B.

Barriers and Facilitators to Effective ASD Care

Despite advances in screening and diagnosis, access to autism-specific services remains highly variable. Geographic disparities, income, and sociodemographic factors influence the availability of specialty and coordinated care (Mazurek et al., 2020; Mazurek et al., 2022). Many primary care settings lack structured referral systems and clear pathways to community

resources, creating fragmentation and delays in service connection (Morris et al., 2019). Primary care providers (PCPs) also report limited awareness of existing community services, and in some regions, resources are scarce or inconsistently distributed (Mazurek et al., 2020). Insufficient reimbursement models and time constraints further hinder comprehensive assessments and follow-up coordination (Mazurek et al., 2020).

Provider Preparedness and Knowledge Gaps

Provider knowledge and confidence were identified as critical determinants of effective ASD care. Multiple studies indicated that PCPs felt underprepared to manage the complex behavioral and medical needs of patients with ASD, citing insufficient training, low self-efficacy, and uncertainty in care coordination (Corden et al., 2021; Mazurek et al., 2020; Morris et al., 2019). Limited familiarity with validated screening tools and diagnostic criteria frequently leads to inconsistent assessment, misinterpretation of symptoms, and delayed referrals (Corden et al., 2021).

Impact of Education and Training Interventions

Evidence consistently supports education as a key facilitator of improved ASD care. Structured training programs significantly enhance provider knowledge, confidence, and self-efficacy (Clarke & Fung, 2022; Donnelley et al., 2020; Dreiling et al., 2021). Morris et al. (2019) found that prior experience or specialized training improved PCP readiness to manage ASD, while those without training reported feeling unprepared. Educational interventions also improve provider communication with patients, families, and interdisciplinary teams (Clarke & Fung, 2022).

Communication and Interprofessional Collaboration

Effective ASD management requires effective communication and collaboration between providers, caregivers, and specialists. Mazurek et al. (2020) and Morris et al. (2019) highlighted that providers often struggle with care coordination and ongoing follow-up after specialist referral. Barriers include fragmented communication systems and cultural differences that affect family-provider relationships (Mazurek et al., 2020). Training in communication and interdisciplinary teamwork has been shown to improve continuity of care and patient satisfaction (Corden et al., 2021).

Curriculum Development and Ongoing Professional Growth

Across studies, providers emphasized the importance of formal training integrated into medical and nursing curricula, covering screening, diagnosis, comorbidity management, and communication strategies (Mazurek et al., 2020; Mazurek et al., 2022). Recommended approaches include case-based learning, interactive workshops, and mentorship programs tailored to specific provider roles (Clarke & Fung, 2022).

Evaluation of Educational and Implementation Models: ECHO and ATTAIN NAV

The literature review identified two models that have demonstrated effectiveness in building provider capacity and supporting system-level process change related to ASD care: the Extension for Community Healthcare Outcomes (ECHO) model and A Tailored Approach to Integrating Autism and Mental Health Services (ATTAIN NAV). Both models share the goal of improving coordination, education, and access to evidence-based care, though they differ in audience and structure.

ECHO (Extension for Community Healthcare Outcomes) Model

The ECHO model, developed at the University of New Mexico, was designed to democratize access to specialty expertise through technology-enabled collaborative learning (Project ECHO, 2024). The model uses a *hub-and-spoke* format in which interdisciplinary specialists at an academic “hub” mentor community-based providers (“spokes”) via video conferencing sessions. These sessions combine brief didactic teaching with case-based discussion, emphasizing shared learning, reflection, and practical application to real patient scenarios. The approach is guided by four core principles:

1. Leveraging technology to share knowledge and resources,
2. Applying case-based learning to master clinical complexity,
3. Promoting best practices to reduce disparities, and
4. Monitoring outcomes to ensure continuous quality improvement.

Empirical studies have demonstrated the model’s impact on provider knowledge, confidence, and collaboration. Mazurek et al. (2024) conducted a Level II quasi-experimental study evaluating a 10-week ECHO Autism series, 90-minute sessions over six months. Dreiling et al. (2022) and Mazurek et al. (2020) (Level III studies) examined similar implementations using 60-minute sessions twice monthly for one year. Across all studies, participants showed significant post-training improvements in self-efficacy, knowledge of ASD, problem-solving ability, and satisfaction with care delivery. Discussion topics included best-practice screening guidelines, coordinated care strategies, and evidence-based interventions for ASD.

However, several gaps were noted. These included a lack of data linking training to long-term practice behavior change, limited guidance on sustaining partnerships for resource navigation, and financial barriers such as low reimbursement for autism-related services.

ATTAIN NAV (A Tailored Approach to Integrating Autism and Mental Health Services)

The ATTAIN NAV model, co-developed by Stadnick and colleagues, was designed to improve access to mental health and family support services for school-age children with ASD through family navigation (Martinez et al., 2023). The program employs lay navigators trained in collaborative goal setting, motivational interviewing, and problem-solving techniques to guide families in accessing behavioral health and community resources.

A Level II study by Martinez et al. (2023) evaluated the ATTAIN NAV model over a 5-week implementation period, following a 1-hour evidence-based training session for clinic staff. The program incorporated tools such as the Pediatric Symptom Checklist (PSC-17) for behavioral screening and a structured referral workflow. Clinic champions facilitated implementation and encouraged integration into daily operations. Outcomes demonstrated high feasibility, acceptability, reach, adoption, and intention to continue use. Providers reported improved coordination with community services and stronger connections between behavioral and primary care settings.

However, the study also identified areas for refinement, including the need to increase screening rates among eligible patients and expand provider engagement to strengthen sustainability.

Summary

The literature consistently highlights significant gaps in provider preparedness, standardized workflows, and care coordination for children with Autism Spectrum Disorder (ASD) within primary care settings. Despite advancements in diagnostic frameworks and screening recommendations, variability in implementation continues to delay early identification and referral. Studies show that primary care providers often lack sufficient training, confidence,

and awareness of community resources, resulting in fragmented care and inequitable access to services (Mazurek et al., 2020; Morris et al., 2019; Corden et al., 2021). Evidence supports structured educational interventions, such as the ECHO Autism model, which improve provider knowledge, self-efficacy, and collaboration through case-based learning and systems-level mentorship (Mazurek et al., 2024; Dreiling et al., 2022). Integrating standardized ASD assessment, referral, and documentation tools into the electronic health record, combined with sustained provider education and interdisciplinary teamwork, emerges as an evidence-based strategy to close identified practice gaps and promote timely, coordinated, and equitable ASD care.

Building upon these findings, this project was designed to address the key barriers identified in the literature specifically, limited provider preparedness and the absence of structured systems to support timely screening and referral. By integrating evidence-based ASD assessment and referral tools within the EHR and delivering targeted provider training through the ECHO Autism model, the project sought to strengthen care coordination, improve documentation practices, and enhance provider confidence in managing ASD across the continuum of care.

Guiding Framework

The Plan–Do–Study–Act (PDSA) model served as the guiding framework for this evidence-based quality improvement project. Originally developed by W. Edwards Deming (1986) and later expanded for healthcare improvement by Langley et al. (2009), the PDSA cycle provides a systematic, iterative approach for testing, implementing, and refining changes in clinical practice. The framework emphasizes continuous learning, stakeholder engagement, and

data-driven decision-making, making it particularly suited for projects aiming to enhance provider performance and system-level processes.

Application for this Project

The PDSA model directly guided the stepwise implementation of this project to improve nurse practitioners' (NPs) knowledge, confidence, and consistency in Autism Spectrum Disorder (ASD) assessment, referral, and documentation. In the Plan phase, baseline gaps were identified, and educational interventions were designed using ECHO Autism principles. The Do phase involved implementing standardized EHR tools and conducting provider training. The Study phase focused on evaluating changes in provider knowledge, workflow efficiency, and documentation accuracy through feedback and chart audits. Finally, the Act phase used outcome data to refine educational content, strengthen EHR integration, and promote sustainability through ongoing mentorship and quality review.

By linking iterative learning with real-time evaluation, the PDSA framework ensured that interventions were both evidence-based and adaptable, fostering a culture of continuous improvement and collaboration in ASD care delivery.

Methods

Design

This quality improvement project used the Plan–Do–Study–Act (PDSA) framework, as described in the previous section, to structure the planning, implementation, evaluation, and refinement of the intervention. The design focused on improving clinical processes by introducing an educational intervention for nurse practitioners, integrating a standardized electronic health record (EHR) workflow, collecting provider feedback and outcome data, and making real-time adjustments throughout the PDSA cycles. This approach reflects core

principles of quality improvement methodology, prioritizing practice change, feasibility, and responsiveness to clinical needs.

Setting

Overview of the Clinic

The quality improvement project took place at an outpatient clinic in central Maryland. This clinic is a multidisciplinary healthcare facility that integrates primary healthcare and mental health services, designed to accommodate the needs of individuals with ASD and their families.

Physical Environment

The clinic is in a community-accessible area, making it convenient for families to access services. The clinic features a welcoming and sensory-friendly environment, with calming colors, natural lighting, and quiet spaces to accommodate individuals with sensory sensitivities. The clinic includes private consultation rooms for physical examinations and mental health assessments. These rooms ensure confidentiality and comfort, with appropriate tools and resources for healthcare providers to conduct assessments and provide care. The clinic has dedicated spaces for training and workshops with audiovisual technology to facilitate presentations and interactive learning experiences.

Services offered.

The clinic serves 8,000 patients each year. Services provided include primary and mental healthcare services. The daily volume of primary care patients is about 15 per provider, and the psychiatric provider-patient volume is 20 patients on Mondays and Thursdays.

Provider Education Programs

The clinic hosts regular training workshops for healthcare providers, fosters a collaborative learning environment where providers can share experiences, and maintains a

library of resources, including educational materials, toolkits, and referral information. Providers are encouraged to utilize these resources to support their practice and improve patient care.

Participants

Participants in this quality improvement project were nurse practitioners employed at a multidisciplinary outpatient clinic in central Maryland. Six nurse practitioners (n=6) were recruited using a convenience sampling approach. Recruitment was initiated through email invitations (Appendix C), followed by the distribution of informed consent forms (Appendix D), demographic questionnaires (Appendix E), and pre-intervention surveys (Appendix F1). Participation was voluntary, and all six eligible providers (N=6) agreed to take part in the project.

The sample included nurse practitioners with diverse roles and schedules: two full-time providers, two part-time providers, one float provider, and one weekend provider. The group comprised a doctoral-prepared family nurse practitioner who owns and oversees the clinic, a doctoral-prepared nurse practitioner with dual certification in psychiatric and family practice, one practitioner certified in psychiatric care, and three family nurse practitioners. The participants ranged in age from 25 to 58 years. All had prior experience managing patients with ASD.

Inclusion criteria required participants to be nurse practitioners employed at the clinic and willing to voluntarily participate in the training, implementation, and evaluation processes. Exclusion criteria included any provider unwilling to provide consent or to participate in any aspect of the project. No patients were directly involved as participants; however, retrospective chart audits of patients diagnosed with ASD were conducted to evaluate provider practices.

Throughout the project, patient confidentiality was strictly maintained, and there was no direct interaction with patients.

Data Collection Tools

Multiple tools were employed to assess provider knowledge, confidence, documentation practices, and referral patterns, as well as to gather feedback on the educational sessions.

Demographic Data Tool

A demographic survey regarding participant characteristics was created by the principal investigator and completed by the six nurse practitioner participants prior to the educational intervention. This was an anonymous electronic survey delivered via an online program called SurveyMonkey. The demographic data tool consisted of open-ended, free-text items. Participants provided information regarding age, gender, race/ethnicity, educational preparation, certification/specialty, employment status, and years of experience caring for patients with ASD.

The chart audit tool

The chart audit tool (Appendix G) was created by the principal investigator. It was used as a process measure before training and an outcome measure after training to extract information from the electronic health record on current processes related to ASD assessment, treatment protocols, specialty referrals, and care documentation. The chart audit tool had the key metrics of date of visit, patient identifier, provider identifier, provider type, use of an assessment tool to determine the patient's need for further evaluation or intervention, referral to specialty care or needed resources, and documentation of treatment plans, barriers, and outcomes.

Baseline data were collected through a six-month retrospective review of all charts with a diagnosis of ASD (n = 23) from nurse practitioners in the clinic (n = 6). The distribution of

reviewed charts was as follows: Provider 1 (n = 4), Provider 2 (n = 3), Provider 3 (n = 2), Provider 4 (n = 2), Provider 5 (n = 7), and Provider 6 (n = 5). These records established the baseline against which the effectiveness of the intervention was evaluated. Following project implementation, an additional set of charts was reviewed (n = 14). Their distribution was: Provider 1 (n = 3), Provider 2 (n = 2), Provider 3 (n = 5), Provider 4 (n = 2), and Providers 5 and 6 (n = 1 each).

By comparing post-training chart audit data with baseline findings, the principal investigator evaluated how the intervention influenced provider behavior, application of knowledge, and adherence to standardized ASD assessment, referral, and documentation practices. Data extracted from electronic health records were coded using a patient legend that replaced identifying information with numerical codes, and the legend was stored separately to maintain confidentiality and ensure HIPAA compliance.

The pretest-survey tool

The pre-test survey tool, developed by the principal investigator, was completed by all six nurse practitioner participants prior to the educational intervention. This survey functioned as a process measure by capturing quantitative data on providers' baseline knowledge, confidence, and practice behaviors related to ASD assessment, referral pathways, treatment planning, and documentation processes. The survey was administered anonymously through SurveyMonkey and included Likert-scale items assessing confidence in using ASD screening tools, recognizing community resources, managing social and behavioral needs, coordinating care, and making appropriate specialty or community referrals. This data provided a baseline understanding of provider practice processes targeted for improvement through the intervention.

The Posttest-Survey Tool

The post-test survey tool (Appendix F2) was developed by the principal investigator and completed by the six nurse practitioner participants immediately after the educational intervention. This tool served as an outcome measure to obtain quantitative data on changes in participants' knowledge, attitudes, and practices related to ASD assessment, treatment protocols, specialty referrals, and care documentation following the training. The survey was administered anonymously through the online platform SurveyMonkey and consisted of Likert-scale statements designed to assess provider confidence in multiple domains, including the use of ASD assessment and screening tools, awareness of community resources, management of social, communication, and behavioral needs, development of individualized treatment plans, care coordination, addressing common co-occurring medical and mental health conditions, and making appropriate referrals to community-based services.³ Likert-scale items were analyzed quantitatively.

The feedback survey tool

The feedback survey tool (Appendix H) was developed by the principal investigator and completed by the six nurse practitioner participants anonymously electronically through an online platform called Survey Monkey following each ECHO Autism training session. This tool served as an outcome measure after training to evaluate participants' satisfaction with the training intervention, assess the perceived relevance of the training, and gather insights for future improvements. The survey included both Likert-scale questions and free-text, open-ended questions. Likert-scale questions evaluated participant satisfaction, perceived relevance of the training, and self-reported confidence in applying new knowledge. Free-text responses invited

participants to share suggestions for improvement, identify barriers or facilitators, and provide additional comments.

Interventions

This quality improvement initiative incorporated several coordinated interventions designed to strengthen provider knowledge, improve workflow consistency, and enhance ASD-related care processes. Collaboration with organizational leaders, EHR support staff, and community agencies ensured that each intervention was feasible, sustainable, and aligned with project goals. All interventions were grounded in evidence-based recommendations from the American Academy of Pediatrics (AAP, 2020) for early identification, coordinated care, and standardized management of ASD.

ECHO Autism Educational Training

The first intervention consisted of participation in the ECHO Autism training series offered on the first and third Wednesday of each month (Appendix I). The program was delivered via Zoom, and included didactic teaching, case-based discussions, and interactive learning. The sessions aimed to increase nurse practitioners' knowledge, confidence, and competence in ASD screening, assessment, referral practices, and care coordination. The training provided foundational content that prepared providers for the subsequent practice changes introduced in the project.

ASD Resource Guide

The second intervention involved integrating a comprehensive ASD resource guide (Appendix J) directly into the EHR. This guide contained verified Maryland and statewide resources, including Early Intervention, the Autism Waiver, Autism Program Planning Success for Employment, and Pathfinders for Autism. Embedding this resource within the EHR

supported accurate referrals, enhanced coordination with community agencies, reduced variability in provider practices, and ensured consistent access to reliable information for family/caregiver support.

Standardized Referral Workflow

The final intervention was the implementation of a standardized ASD referral workflow (Appendix K) within the EHR. This workflow outlined step-by-step actions for confirming developmental concerns, using an ASD checklist, initiating referrals, documenting caregiver engagement, and assigning follow-up tasks. The workflow standardized practice expectations, reduced fragmentation, and strengthened continuity between providers, families, and community service organizations.

Procedure

This quality improvement project was implemented using the PDSA framework to guide structure, iterative changes in provider education, workflow standardization, and clinical processes for ASD assessment, referral, and documentation. Two full PDSA cycles were completed to evaluate and refine the intervention.

PDSA Cycle 1

Plan Phase (7 Months).

Planning began in fall 2024 when the principal investigator met with clinic leadership to introduce the project, identify workflow gaps, and collect provider feedback. Preliminary chart reviews revealed inconsistencies in ASD screening, referral, and documentation. A critical appraisal of the literature was completed in November 2024 to identify best practices and inform intervention development. The project proposal was successfully defended in December 2024, and Institutional Review Board (IRB) approval was obtained in February 2025. Intervention and

data collection tools were then developed. To ensure accuracy and usability, the principal investigator contacted each organization to verify service availability and referral procedures. The educational component, ECHO Autism training was scheduled in collaboration with the ECHO team and clinic leadership.

Do Phase (2 Months).

Recruitment emails were sent in March 2025 to all six nurse practitioners, and all agreed to participate ($n = 6$). After providing informed consent, participants completed demographic forms and the pre-test survey. During this period, the clinic director, office manager, and principal investigator integrated the ASD resource guide and standardized referral workflow into the EHR. A six-month retrospective chart audit ($n = 23$) was also conducted to establish baseline practice. The first ECHO Autism training session was held on March 19, 2025, via Zoom. The session lasted 90 minutes, followed by 30 minutes of training on the new EHR-based processes. Immediately afterward, the standardized workflow was activated in the EHR. Nurse practitioners began using embedded tools to assess needs, initiate referrals, and document ASD-related care. Medical assistants contacted families to confirm service access and assist with addressing any barriers. Participants then completed the post-test and feedback surveys.

Study Phase (2 Months).

Pre-test, post-test, and feedback survey responses were exported into Excel and reviewed for completeness. Each participant received a unique identifier to protect confidentiality. Quantitative data were analyzed using descriptive statistics to assess changes in knowledge, confidence, documentation accuracy, and referral patterns. Qualitative survey responses were analyzed thematically. Trustworthiness was strengthened through member checking, maintaining an audit trail, and using reflexive journaling to address potential bias.

Act Phase (1 Month).

Findings indicated improvements in providers knowledge, confidence, and workflow consistency; however, feedback showed that the initial training session was too long. The educational format was revised to shorten the next session and improve engagement. These adjustments informed planning for Cycle 2.

*PDSA Cycle 2***Plan Phase (1 Month).**

Planning for Cycle 2 focused on incorporating feedback from Cycle 1. The principal investigator collaborated with the ECHO Autism team and clinic leadership to streamline the training structure and provide additional technical support.

Do Phase (1 Month).

The revised training session was delivered on April 2025. The session lasted 30 minutes with an additional 15 minutes reinforcing use of the resource guide and standardized referral workflow. Immediately following the session, participants completed the post-test and feedback surveys. A post-training chart audit (n = 14) was then conducted to assess adoption of the workflow and changes in documentation and referral practices.

Study Phase (2 Months).

Data from Cycle 2 were analyzed using descriptive statistics to evaluate changes in provider confidence, referral rates, and documentation accuracy. Results were compared with Cycle 1 outcomes to evaluate sustainability and improvements. Member checking supported confirmability.

Act Phase (1 Month).

Findings from Cycle 2 informed formulation of the sustainability plan. This included ongoing technical support, periodic workflow reinforcement, continued collaboration with community agencies, and routine monitoring of referral quality through chart reviews.

Results

Consistent with the procedures outlined in the Methods section, the following results present findings from both quantitative and qualitative data collected to evaluate changes in provider knowledge, confidence, and clinical practices following the educational intervention. Quantitative results include demographics, pre-test and post-test survey findings, feedback surveys, and chart audits. Qualitative results are drawn from open-ended feedback survey responses, offering insight into participants' experiences and perceptions. Together, these findings illustrate how the intervention influenced provider confidence, knowledge, and clinical practice.

All surveys were administered electronically through SurveyMonkey, while chart audit data were collected using a structured audit tool applied to the electronic health record. The datasets were then exported into Microsoft Excel and carefully reviewed prior to analysis. All responses were checked for completeness, and no missing data was identified. Each participant was assigned a unique identifier code (P1–P6) to preserve anonymity, and all names or other identifying information were excluded from the analytic dataset. Data were cleaned by removing non-eligible rows and representing each participant only once under the unique identifier code (P1–P6).

Quantitative Results

The quantitative findings summarize measurable outcomes from the intervention, beginning with participant demographics and followed by surveys and chart audit results. Demographic data established the background characteristics of the six nurse practitioner participants. Pre- and post-survey responses were then used to assess changes in provider confidence across key domains of evidence-based ASD care, while feedback surveys captured satisfaction with the training, its perceived relevance to practice, and areas identified for improvement. Importantly, feedback also informed adjustments to subsequent training sessions, ensuring the educational approach remained responsive to the needs of the participants. Finally, chart audits provided objective evidence of changes in clinical behaviors, including the use of assessment tools, referrals, and documentation practices. The quantitative data provided a structured overview of how the intervention influenced both provider-reported confidence and observable practice behaviors.

Demographic data

Demographic data for age were collected in the categories of 25–39 and 40–58 years; these were coded numerically as 1 (25–39) and 2 (40–58). Category midpoints (32 and 49) were used to estimate the mean and standard deviation of age. Certification specialty was coded categorically, with 1 representing Family Nurse Practitioners (FNPs) and 2 representing Psychiatric Mental Health Nurse Practitioners (PMHNPs). Years of experience were categorized as less than 1 year, 1–3, 4–6, 7–10, and over 10 years; for analysis, these ranges were assigned midpoints of 0.5, 2, 5, 8.5, and 12, respectively. Categorical variables, including specialty and

experience categories, were analyzed using frequency counts and percentages, while approximate means and standard deviations for age were calculated based on the category midpoints.

As seen in Table 1, six nurse practitioners (N = 6) participated in the project, yielding a 100% response rate. Most participants (83%) were between 40 and 58 years of age (M = 46.2, SD = 6.9), while one participant (17%) was 25–39 years old. Four providers (67%) were Family Nurse Practitioners (FNPs), and two (33%) were Psychiatric-Mental Health Nurse Practitioners (PMHNPs). Years of experience at the clinic varied: two participants had 4–6 years, while the remainder represented a range from less than 1 year to more than 10 years. This diversity reflects a sample with varied clinical backgrounds and experience levels.

Table 1

Demographic Characteristics of Participants (N = 6) 

Characteristic	N	%
Age		
25–39 years	1	16.7
40–58 years	5	83.3
<i>M (SD), years</i>	46.2 (6.94)	
Specialty		
Family Nurse Practitioner (FNP)	4	66.7
Psychiatric-Mental Health NP (PMHNP)	2	33.3
Years of Experience		
<1 year	1	16.7
1–3 years	1	16.7
4–6 years	2	33.3
7–10 years	1	16.7
>10 years	1	16.7

Pretest and Posttest Survey Results

Survey items for pretest and posttest used a 4-point scale, ranging from ‘Not at all confident’ (1) to ‘Very confident’ (4), with higher scores reflecting greater provider confidence. The data was then reorganized into a long-format structure, with one record per participant, survey phase, and item. Descriptive statistics were calculated in Excel to summarize pre-test and post-test responses. Frequencies and percentages were computed for each response category allowing comparison of how many participants selected each confidence level before and after the intervention. Measures of central tendency (means) were calculated, and variability was determined to obtain standard deviations. Results were reported separately for the pre- and post-test for each survey item.

As seen in Table 2, participants (N = 6) demonstrated consistent improvements across all domains. From Pre-test 1 to Post-test 1, average confidence scores increased by approximately one point in most areas, including ability to assess ASD (M=2.67 to 3.67) and knowledge of community resources (M=2.67 to 3.67). Between Pre-test 2 and Post-test 2, participants began at higher baseline scores and reached the maximum confidence level (SD=4.00) in all areas by the second post-test. Collaboration with providers also improved over time, increasing from Pretest (Mean=3.00 to 4.00) on Post-test 2.

Table 2

Descriptive Statistics for Pre- and Post-Test Surveys (N = 6)

Survey Item	Pre-test 1 Mean (SD)	Post-test 1 Mean (SD)	Pre-test 2 Mean (SD)	Post-test 2 Mean (SD)
Ability to assess ASD	2.67 (0.52)	3.67 (0.52)	3.67 (0.52)	4.00 (0.00)
Use of screening tools	3.00 (0.00)	3.67 (0.52)	3.67 (0.52)	4.00 (0.00)
Knowledge of community resources	2.67 (0.52)	3.67 (0.52)	3.67 (0.52)	4.00 (0.00)
Management of communication/behavioral needs	2.83 (0.75)	3.67 (0.52)	3.67 (0.52)	4.00 (0.00)
Collaboration with providers	3.00 (0.63)	3.50 (0.55)	3.50 (0.55)	4.00 (0.00)

As seen in Table 3, across all domains, the proportion of participants reporting “Very confident” increased steadily from Pre-test 1 to Post-test 2. For example, in “Ability to assess ASD,” no participants reported being “Very confident” at Pre-test 1, compared to 67% at Post-test 1 and 100% by Post-test 2. Similar upward trends were observed for use of screening tools, knowledge of community resources, and management of communication/behavioral needs. Collaboration with providers showed more gradual gains, with 50% “Very confident” at Pre-test 1 rising to 100% by Post-test 2.

Table 3

Frequencies and Percentages of Confidence Levels Across All Survey Items (N = 6)

Survey Item	Response Category	Pre-test 1 n (%)	Post-test 1 n (%)	Pre-test 2 n (%)	Post-test 2 n (%)
Ability to assess ASD	Not very confident (2)	2 (33.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
	Fairly confident (3)	4 (66.7%)	2 (33.3%)	2 (33.3%)	0 (0.0%)
	Very confident (4)	0 (0.0%)	4 (66.7%)	4 (66.7%)	6 (100.0%)
Use of screening tools	Fairly confident (3)	6 (100.0%)	2 (33.3%)	2 (33.3%)	0 (0.0%)
	Very confident (4)	0 (0.0%)	4 (66.7%)	4 (66.7%)	6 (100.0%)
Knowledge of community resources	Not very confident (2)	2 (33.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
	Fairly confident (3)	4 (66.7%)	2 (33.3%)	2 (33.3%)	0 (0.0%)
	Very confident (4)	0 (0.0%)	4 (66.7%)	4 (66.7%)	6 (100.0%)
Management of communication/behavioral needs	Not very confident (2)	1 (16.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
	Fairly confident (3)	4 (66.7%)	2 (33.3%)	2 (33.3%)	0 (0.0%)
	Very confident (4)	1 (16.7%)	4 (66.7%)	4 (66.7%)	6 (100.0%)

Survey Item	Response Category	Pre-test 1 n (%)	Post-test 1 n (%)	Pre-test 2 n (%)	Post-test 2 n (%)
Collaboration with providers	Fairly confident (3)	3 (50.0%)	2 (33.3%)	2 (33.3%)	0 (0.0%)
	Very confident (4)	3 (50.0%)	4 (66.7%)	4 (66.7%)	6 (100.0%)

Feedback Survey Results

Feedback surveys carried out after each training cycle measured satisfaction, perceived usefulness, and confidence in applying for the training. Data was collected after two training sessions labelled Feedback 1 after the first session and Feedback 2 after the second session. For the feedback survey, all responses were recoded into the unified 1–3 Likert scale, with higher scores indicating higher satisfaction, usefulness, and confidence

Descriptive statistics were calculated in Excel to summarize Feedback 1 and Feedback 2 responses. Frequencies and percentages were computed for each response category allowing comparison of how many participants selected each satisfaction, usefulness, and confidence after the teaching intervention. Measures of central tendency (means) were calculated, and variability was determined to obtain standard deviations. Results were reported separately for feedback survey 1 and feedback survey 2.

Results after both training sessions indicated consistently elevated levels of satisfaction, usefulness, and confidence, levels with slight improvements observed in the second cycle (Table 4). Both cycles reflected high ratings across satisfaction, usefulness, and confidence, with incremental improvements observed between cycles.

For overall satisfaction, the mean score increased from 3.50 (SD = 0.71) in Survey 1 to 3.70 (SD = 0.48) in Survey 2. In the first cycle, participants were evenly split between “Very

Satisfied” (50%) and “Satisfied” (50%). By the second cycle, a larger majority (70%) reported being “Very Satisfied,” with the remaining 30% “Satisfied.”

For usefulness, scores were uniformly high across both cycles ($M = 4.00$, $SD = 0.00$). All participants rated the training as “Very Useful” in both Survey 1 and Survey 2, confirming the relevance of the content to practice.

For confidence, the mean score increased from 3.50 ($SD = 0.71$) to 3.70 ($SD = 0.48$) between cycles. In Survey 1, participants were evenly split between “Very Confident” (50%) and “Fairly Confident” (50%). By Survey 2, 70% rated themselves “Very Confident” while 30% reported being “Fairly Confident.”

Table 4

Descriptive Statistics for Feedback Survey 1 and 2 (N = 6)

Domain	Feedback Survey 1 (M, SD)	Freq (%)	Feedback Survey 2 (M, SD)	Freq (%)
Overall Satisfaction	3.50 (0.71)	Very Satisfied = 1 (50%) Satisfied = 1 (50%)	3.70 (0.48)	Very Satisfied = 7 (70%) Satisfied = 3 (30%)
Usefulness	4.00 (0.00)	Very Useful = 2 (100%)	4.00 (0.00)	Very Useful = 10 (100%)
Confidence	3.50 (0.71)	Very Confident = 1 (50%) Fairly Confident = 1 (50%)	3.70 (0.48)	Very Confident = 7 (70%) Fairly Confident = 3 (30%)

Chart Audit Results

Chart audits provided objective evidence of practice change. The data analysis was conducted using descriptive statistical methods in Microsoft Excel. The pre- and post-intervention extraction files were transferred from the Word document into Excel spreadsheet. All data were de-identified prior to analysis to maintain confidentiality and protect patient

privacy. Patient identifiers such as names, dates of birth, and medical record numbers were removed, and each case was assigned a unique code number. The data was then reviewed and cleaned to ensure consistency. This was done by removing extra rows and text and establishing uniform variables that were established including ASD diagnosis documented, assessment tool used, referral to specialty care or needed resources, and documentation of treatment plan, barriers, and follow-up. Each patient record was then reformatted into a single row with categorical entries of “Yes” or “No” to allow for systematic analysis.

Following data cleaning, frequencies were calculated to determine how often each variable was documented in the medical records. Using Excel, the number of “Yes” and “No” responses for each variable were tabulated, allowing identification of the proportion of cases in which ASD-related assessments, diagnoses, referrals, and treatment plans were recorded. These frequencies were then converted into percentages to show the relative distribution of documentation practices before and after the intervention.

The results for ASD assessment, referral, documentation and follow up processes before and after intervention are presented in Table 5. The results show that six months before the intervention, there were 23 patients with a diagnosis of ASD seen at the clinic, all of which had no assessment tools used to determine the need for further evaluation or intervention. Only five out of 23 cases (21.7%) were referred to specialty care or the required resources. In addition, only seven out of 23 ASD cases (30.4%) had documentation of treatment plan, barriers, and outcomes. Two months post-implementation of the intervention, there were 14 cases of ASD diagnoses, in which all (100%) had assessment tools used to determine the need for further evaluation or intervention. Also, all (100%) of the diagnosed cases were referred to specialty


care or the required resources. The documentation of treatment plan, barriers, and outcomes was made in 13 out of 14 cases (92.9%) after the intervention. 


Table 5
ASD Assessment, Referral and Documentation before (N=23) and after(N = 14) intervention.

Process	Pre		Post	
	n	%	n	%
ASD Diagnosed Cases	23	-	14	-
Assessment tool used to determine the need for further evaluation or intervention	0	0.0	14	100
Referral to specialty care or needed resources	5	21.7	14	100
Documentation of treatment plan, barriers, and outcome	7	30.4	13	92.9

Qualitative Analysis

The qualitative findings consist of feedback responses to open-ended questions embedded within the feedback surveys, which invited participants to describe their experiences and perspectives regarding the educational intervention. Feedback was collected in two phases, beginning with Feedback 1 after the initial session and followed by Feedback 2 after the revised session based on input from feedback 1, enabling comparison of participant impressions across stages of the intervention. The analysis of these responses revealed recurring themes that captured participants' evaluations of session structure, content relevance, and overall training experience.

Feedback Survey

 The dataset was first reviewed to identify the location of open-ended feedback items. The initial header row, which contained survey questions and corresponding choice labels including Very satisfied, Satisfied, Dissatisfied, was removed to retain only participant responses. Next, the open-ended feedback columns were isolated, specifically the items “What suggestions do

you have for improving future training sessions?” and “Any additional comments or feedback?” Blank or missing responses were filtered out using Excel’s data functions to ensure that only meaningful text entries were retained. The resulting clean table of open-ended responses provided a structured dataset, which served as the foundation for subsequent thematic analysis, including coding, theme development, and interpretation.

Open-ended responses were analyzed thematically using Braun and Clarke’s six-phase framework (2006), which guided coding, theme development, and interpretation. The responses were read multiple times to ensure familiarity, and initial codes were assigned to meaningful segments of text. Examples included coding “too long” and “make training shorter” as session length concerns, “educative” and “very informative” as useful content, “great training” as a positive overall impression, and “none” as no suggestions.

These codes were then organized into broader categories: concerns about duration were grouped under training structure, content usefulness under relevance to practice, neutral responses under no suggestions provided, and favorable comments under overall impressions. From these categories, four overarching themes were developed: Session Length and Pacing, No Suggestions/Neutral Feedback, Relevance to Practice, and Positive Experience. Each theme was reviewed against the dataset for coherence and distinctiveness, and representative comments were selected to illustrate the findings.

Table 6 shows the comparison of feedback themes across feedback 1 and feedback 2. Regarding session length and pacing, participants in feedback 1 frequently commented on the duration of the sessions, with remarks such as “too long” and “make training shorter.” These concerns decreased in feedback 2, suggesting that pacing adjustments made between cycles may have been effective. For no suggestions/neutral feedback, several participants across both

surveys provided neutral feedback, using responses such as “none” or “no suggestions.” In addition, neutral responses appeared more frequently in feedback 2, following refinements.

Regarding relevance to practice, participants consistently emphasized the value of the training content across both surveys, with responses such as “educative” and “very informative.” This theme remained stable throughout both cycles, underscoring the training’s usefulness and applicability to professional practice. For positive experience, positive impressions, such as “great training,” were noted in both surveys. These remarks became more frequent in Survey 2, reflecting a stronger overall endorsement of the training after modifications were implemented.

Table 6
Comparison Themes Across Feedback Survey 1 and Feedback Survey 2

Session Length and Pacing	Several participants commented that the session was “ <i>too long</i> ” suggested “ <i>make training shorter.</i> ”	Fewer comments on session length were noted, suggesting pacing adjustments were effective.
No Suggestions / Neutral Feedback	Some participants responded with “ <i>none</i> ” or “ <i>no suggestions,</i> ” indicating limited input.	Neutral responses increased, suggesting more participants were satisfied with the sessions as delivered.
Relevance to Practice	Training described as “ <i>educative</i> ” and “ <i>very informative,</i> ” highlighting perceived usefulness.	Similar responses emphasizing “ <i>educative</i> ” and “ <i>very informative,</i> ” showing this remained a consistent strength.
Positive Experience	General praise present, e.g., “ <i>great training,</i> ” though less frequent.	Positive remarks appeared more often, with stronger emphasis on overall satisfaction.

Ethical Considerations/Protection of Human Subjects

This quality improvement project was designed to improve provider knowledge, confidence, and clinical practices in the management of patients with ASD. It did not involve experimental treatments or direct patient participation. All data collected were limited to nurse

practitioner participants and retrospective chart audits, with no direct contact with patients or families.

Before implementation, the project underwent review by the Institutional Review Board (IRB), which granted approval and classified it as an exempt quality improvement initiative. This exemption was granted because the study's objectives, methodology, participant recruitment, and data collection procedures aligned with standards for quality improvement activities, ensuring compliance with ethical standards and federal regulations. Provider participation was voluntary, and informed consent was obtained from all participants prior to data collection.

To ensure confidentiality, the institution's email was used for communication. Quantitative data was reported in aggregate form, and qualitative responses were presented without any identifying information. All survey and demographic data were de-identified and securely stored in password-protected electronic files accessible only to the project lead. Similarly, chart audit data were de-identified and assigned unique codes, with no patient names, addresses, or other protected health information recorded. All procedures adhered to the Health Insurance Portability and Accountability Act (HIPAA) regulations and the clinic's privacy policies.

Additionally, measures were taken to minimize potential risks to participants. They were informed of their right to withdraw at any time without facing any negative consequences and were provided with appropriate support throughout the process. Providers were assured that all survey results and feedback responses would be reported solely in aggregate, with no individual identifiers linked to specific responses. Participation or non-participation did not influence their employment status, workload, or professional evaluations. By adhering to these ethical safeguards, the project upheld respect for participants, protected patient confidentiality, and

ensured compliance with professional and regulatory standards for quality improvement activities.

Cost Benefit Analysis

For six nurse practitioners in Maryland participating in two 90-minute ECHO Autism sessions and implementing an ASD-specific EHR screening and resource tool, the Year 1 implementation cost was estimated at approximately \$1,950 (including NP training time, EHR implementation, logistics, and modest maintenance), based on a mean NP wage of about \$61/hour. Benefit streams were grounded in published utilization and cost data for children with autism, including increased outpatient visit frequency (Hand et al., 2021), high baseline spending (Grosse et al., 2021), increased use of emergency department services for behavioral concerns and substantial caregiver labor-market impacts (Cidav et al., 2012; Zhao et al., 2024).

Table 7

Estimated Implementation Costs for Six Nurse Practitioners (Maryland, Year 1)

Cost Category	Description / Assumptions	Estimated Cost (USD)
ECHO Autism Training Time	6 NPs × 2 sessions × 90 min each = 18 h \$61.11/h	\$1,100 (rounded)
EHR Implementation Time	1 h per NP × 6 NPs \$61.11/h	\$370
Training Logistics	Admin coordination, materials, tech support	\$300
Annual Maintenance	2 NP h + 2 Admin h \$61.11 & \$30/h	\$180
Total Annual Cost		≈ \$1,950

Note. Hourly wage based on Maryland mean NP rate ≈ \$61/h (U.S. Bureau of Labor Statistics, 2024).

Table 8**Estimated Annual Benefits from ASD Protocol Implementation (23 Patients)**

Benefit Category	Evidence Source / Assumptions	Estimated Annual Benefit (USD)
Time Saved in Clinic Visits	10 min saved/visit × 6 visits × 23 patients × \$61/h = 23 h saved	\$1,406
Reduced ED Visits	Baseline = 11.5 visits/year; 16 % reduction (≈ 1.8 visits avoided) × \$1,200/visit	\$2,208
Reduced Long-Term Service Intensity	2 % reduction in annual ASD spending (\$20,000/child × 23)	\$9,200
Reduced Caregiver Work Loss	1 workday recovered/family × \$200 × 23 families	\$4,600
Total Annual Benefits		≈ \$17,414

Assuming a 10-minute reduction in clinician time per ASD visit, a 16% reduction in ED visits, a 2% reduction in non-ED health spending, and recovery of 1 workday per caregiver annually, total annual benefits were approximately \$17,400, yielding a net annual benefit of \$15,500 and a benefit–cost ratio of ~8.9:1. Even when restricted to direct clinic-level benefits (time saved and reduced ED use), the intervention remains cost-saving, with a benefit–cost ratio of 1.85:1.

Discussion of Results.

Quantitative findings from the pre-survey and post-survey showed uniform gains across all competency areas. Initially, 0% of participants reported being very confident in assessing ASD, using screening tools, identifying community resources, managing behavioral and communication needs, or collaborating with other providers. Following the intervention, 100% of participants reported to be very confident in all these domains. Feedback survey results further

supported these changes. After the first training session, 50% of participants reported being very satisfied and very confident in applying the content. After the session was shortened in response to feedback, these ratings increased to 70%, demonstrating that instructional pacing contributed to improved engagement and satisfaction. These increases in confidence aligned with measurable changes in documented clinical practice, as evidenced by the chart audit. Prior to the intervention, 0% of charts reflected the use of standardized ASD assessment tools, 21.7% included referrals to specialty or community services, and 30.4% documented treatment planning and follow-up. Post-intervention, 100% of charts showed the use of an ASD-specific assessment tool and 100% included referrals to appropriate services, while documentation of treatment planning increased to 92.9%.

Qualitative feedback helped contextualize these measurable outcomes. Participants consistently described the training as relevant and useful, noting increased clarity regarding available resources and greater confidence in communicating care needs with families. Several participants highlighted that the embedded referral workflow made the process more straightforward and easier to implement in daily practice. Additionally, comments regarding the improved pacing of the second session aligned with the observed increase in reported satisfaction and confidence.

Implications For Practice

This quality improvement project demonstrated that integrating ECHO Autism education with a standardized electronic health record (EHR) workflow meaningfully improved provider knowledge, confidence, and adherence to evidence-based practices for individuals with Autism Spectrum Disorder (ASD). Unlike previous studies that focused primarily on provider education (Mazurek et al., 2020; Morris et al., 2019; Clarke & Fung, 2022), this project extended the

evidence by demonstrating how knowledge gains can be sustained through system-level change. Embedding standardized assessment and referral processes into the EHR transformed education into a sustainable model of practice improvement.

In practical terms, the findings show that structured, evidence-based training when reinforced by workflow tools enables nurse practitioners to identify patient needs earlier, make timely referrals, and document care more consistently. This combination reduced fragmentation of services and promoted equitable, coordinated care. When providers are supported with both knowledge and integrated clinical tools, care delivery becomes more consistent, initiative-taking, and patient-centered. The project therefore offers a replicable framework for improving ASD management within primary care settings.

Beyond reinforcing prior research, this initiative bridged the gap between learning and sustained application. While earlier studies confirmed that ECHO Autism enhances provider confidence, sustaining those improvements remained uncertain. This project demonstrated that pairing ECHO education with workflow redesign institutionalized new behaviors, translating learning into measurable, durable outcomes in provider practice and documentation.

Theoretically, the application of the Plan–Do–Study–Act (PDSA) framework was instrumental in aligning education, feedback, and process refinement. Findings validated the model’s strength as a driver of continuous learning and system change, transforming iterative improvement cycles into long-term, data-informed outcomes. This integration also highlighted the nurse practitioner’s role as a system-level leader who bridges education and implementation to advance quality care.

The broader implications extend beyond the clinic. The results support the inclusion of ASD-specific education and standardized referral workflows as quality metrics in primary care.

Health organizations and policymakers can use these findings to justify investment in structured training, EHR-integrated tools, and reimbursement models that incentivize early screening, comprehensive assessment, and coordinated follow-up. Such initiatives can reduce diagnostic delays, enhance access to services, and promote equity in ASD care delivery.

Overall, the improvements in provider confidence, referral practices, and documentation quality underscore that structured education coupled with workflow redesign can transform practice. These results advance the science of quality improvement and contribute to a more inclusive, equitable, and sustainable model of care for individuals with ASD.

Limitations

This project was implemented in a single outpatient clinic with a small convenience sample of six nurse practitioners, which limits the generalizability of the findings to larger or more diverse healthcare settings. The close-knit nature of the clinic and the strong working relationships among staff may also have contributed to the successful adoption of the intervention, and outcomes may differ in clinics with less cohesive teams or greater organizational complexity. The standardized referral workflow was integrated into one specific electronic health record system, and adapting the process to other systems may require additional time, technical support, and administrative approval. Time was also a notable consideration throughout the project. Coordinating training sessions required rearranging clinic schedules, and even with session adjustments, participation depended on providers having flexible availability and manageable patient volumes. In clinics with higher patient loads or limited staffing coverage, securing protected time for training, workflow orientation, and ongoing reinforcement may be more difficult. Finally, because the post-intervention chart audit occurred soon after

implementation, the long-term sustainability of improved documentation, assessment, and referral practices could not be fully evaluated.

Recommendations for Future Practice

To sustain the improvements observed in provider competence and clinical practice, continued reinforcement and integration of the intervention components are recommended. First, the clinic should maintain ongoing participation in ECHO Autism or similar evidence-based tele-mentoring programs to support continued provider learning, reinforce best practices, and promote interdisciplinary collaboration. Incorporating periodic refresher trainings may help prevent knowledge regression and sustain the confidence gained through the initial intervention.

Second, continued use of the standardized referral and documentation workflow within the electronic health record is essential for maintaining consistency in ASD-related care processes. Quarterly chart audits and feedback cycles are recommended to monitor adherence, identify opportunities for refinement, and ensure accountability. These audits can also support data-driven quality improvement planning and facilitate timely identification of system-level barriers.

Third, expanding the scope of the intervention to include additional clinical staff—such as medical assistants, care coordinators, and behavioral health providers—may enhance care coordination and improve continuity across interdisciplinary teams. Similarly, replication of the intervention in other clinics within the organization or regional network may support broader practice alignment and help reduce disparities in ASD care across service settings.

Finally, further research is warranted to evaluate the long-term impact of standardized ASD workflows on patient-level outcomes. Future studies may examine caregiver satisfaction, time to referral completion, engagement with community-based resources, and developmental or

behavioral progress among patients. Evaluating these outcomes over longer intervals will help determine the sustained clinical and operational impact of the intervention and inform ongoing quality improvement efforts.

Conclusion

This evidence-based quality improvement project aimed to enhance nurse practitioner knowledge, confidence, and practice consistency in the assessment, referral, and documentation of Autism Spectrum Disorder (ASD) in a multidisciplinary outpatient clinic. Guided by the Plan–Do–Study–Act framework, the intervention integrated ECHO Autism training with a standardized electronic health record referral and documentation workflow. The results demonstrated meaningful improvements in provider confidence across clinical domains, increased utilization of evidence-based assessment tools, substantial gains in referral practices, and significantly improved documentation completeness.

These findings underscore the importance of combining structured educational strategies with workflow redesign to support sustainable practice change. The ECHO Autism model effectively expanded provider competency and promoted collaborative decision-making, while the embedded workflow facilitated consistent, equitable, and coordinated care delivery. By improving provider preparedness and standardizing clinical processes, this project contributed to reducing practice variability and supporting early and appropriate access to specialized services for individuals with ASD.

While the project was conducted in a single clinical setting with a small sample size, the positive outcomes highlight the potential for broader dissemination and replication in similar primary care environments. Ongoing education, routine audit cycles, and continued interprofessional collaboration will be essential for sustaining progress and advancing quality

care for individuals with ASD. Ultimately, integrating evidence-based training and standardized care processes provides a feasible and impactful approach for strengthening ASD care delivery and supporting improved outcomes for patients and families.

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Appendix A

Table A1

Polit and Beck's evidence hierarchy

Level of evidence	Study design	Studies
I	systematic review of relevant and multiple RCTs and meta-analyses of RCTs	Clarke and Fung, 2022
II	Evidence obtained from at least one well-designed RCT	Martinez et al., 2023 Mazurek et al., 2024
III	Well-designed, non-randomized controlled trials, single group pre-post cohort, time series, or matched experimental studies	Dreiling et al., 2022 Corden et al., 2021 Donnelly et al., 2023
IV	Evidence obtained from well-designed non-experimental research	Morris et al., 2019
IV		Mazurek et al., 2020
V	Opinion of respected authorities based on clinical experience, descriptive studies, or reports of expert committees	

Appendix B

Table B1

Synthesis table

<u>Citation</u>	<u>Design/Purpose</u>	<u>Sample & Setting</u>	<u>Data Collection, Measures and Follow-up</u>	<u>Findings</u>	<u>Appraisal Worth Practice</u>	<u>Conclusion</u>
<p>Citation : Morris et al., 2019</p>	<p>Design: Scoping review</p> <p>Purpose: To reveal gaps in knowledge about healthcare services provision in the population with ASD and highlight areas of further research and knowledge development.</p>	<p>Sample: 27 studies, which comprised 13 quantitative, 10 qualitative, and 4 mixed-methods studies. The studies involved a diverse group of healthcare professionals, including nurses, allied health professionals, pediatricians, primary care physicians, and others, with a total of 6,537 participants across the studies</p>	<p>Data Collection: Data extraction of demographic information, quantitative data, and thematic insights</p> <p>Measures: Summarization of themes across the studies.</p> <p>Follow-up: None</p>	<p>Findings: Healthcare providers felt that caring for individuals with autism involved complexities that extended beyond their typical roles and responsibilities. Providers reported a lack of adequate knowledge and resources related to autism. Healthcare providers lacked specialized training in autism care. Many expressed a need for more training opportunities to enhance their skills and knowledge in this area. Ineffective communication and</p>	<p>Appraisal Worth Practice: The review emphasizes the importance of targeted training programs for healthcare providers to improve their competence in working with individuals with autism. It calls for systemic changes in healthcare settings, advocating for policy changes and resource allocation to create a supportive environment. The review also emphasizes the value of interdisciplinary collaboration in providing holistic care, addressing medical, psychological, and social aspects of autism. Recognizing the</p>	<p>Conclusion: The study emphasizes the need for healthcare providers to understand their experiences with individuals with autism to improve their care. Six key themes identified include the need for enhanced training, improved communication strategies, and better resource allocation. These themes highlight the challenges faced by providers in delivering care to individuals with autism. The review advocates systemic changes within healthcare settings to create a more supportive environment for both</p>

		<p>Setting: Healthcare providers in primary, secondary or tertiary environment</p>		<p>collaboration with patients, caregivers, and other professionals Emphasis on the need for ongoing education and training related to autism to improve their understanding and ability to work effectively with this population . The findings indicated a broader need for systemic changes within healthcare settings to improve care for individuals with autism.</p>	<p>diversity within the autism spectrum allows healthcare providers to tailor services to different demographic groups.</p>	<p>providers and patients, addressing organizational barriers and enhancing resource allocation. and to evaluate the effectiveness of interventions and training programs. This research should aim to fill the identified gaps and inform best practices in autism care .</p>
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<u>Citation</u>	<u>Design/Purpose</u>	<u>Sample & Setting</u>	<u>Data Collection, Measures and Follow-up</u>	<u>Findings</u>	<u>Appraisal Worth Practice</u>	<u>Conclusion</u>
<p>Citation: Clarke and Fung; 2022</p>	<p>Design: Systematic review</p> <p>Purpose: The main purpose of the studies was to evaluate the effectiveness of different educational interventions aimed at improving physicians' knowledge and skills in diagnosing and managing ASD.</p>	<p>Sample: The studies involved a variety of healthcare professionals, primarily focusing on physicians</p> <p>Setting</p>	<p>Data Collection: Medical Education Research Study Quality Instrument used to assess studies</p> <p>Measures: Data abstraction tool to obtain information on educational programs, content, delivery method, duration, and frequency, learning objectives, outcome measures, results, and trainee demographics</p> <p>Follow-up: None</p>	<p>Findings: Specialized training programs for physicians showed positive results in increasing general and physician-specific knowledge of autism. Self-efficacy improved after training, with physicians reporting increased comfort in identifying ASD symptoms, making appropriate diagnoses, and providing care. Some studies found lasting impact, while 67% of studies showed significant increases in autism screening practices among physicians. However, two studies found no significant changes and variability in the duration of these changes post-training.</p>	<p>Appraisal Worth to Practice: The review highlights the importance of specialized training programs for physicians to improve their knowledge and self-efficacy in providing care for Autism Spectrum Disorder (ASD). These programs can lead to better diagnostic practices and management of autistic patients, improving patient outcomes. Increased autism screening rates among trained physicians suggest that such programs can lead to earlier identification of ASD. The review also emphasizes the need for ongoing evaluation of training programs and the need for standardized, validated modules to ensure consistent and high-quality education. The findings also support the idea of interdisciplinary training, which includes physicians and allied health professionals, to enhance the overall quality of care provided to autistic individuals.</p>	<p>Conclusion: The review suggests that specialized training programs can enhance physicians' knowledge and self-efficacy about Autism Spectrum Disorder (ASD). However, there is a lack of evidence on how training affects practice behavior, such as providing appropriate accommodations or engaging with autistic patients. The quality of the studies was medium, indicating a need for better-designed studies with standardized measures. Given the increasing prevalence of ASD and the shortage of specialists, there is a pressing need for effective specialized training programs to equip healthcare professionals with the necessary skills to provide high-quality care. Future studies should focus on developing and evaluating such programs.</p>

<p>Martinez et al., 2023</p>	<p>Design: Mixed methods design. Purpose: The primary purpose of the study was to evaluate the implementation of the ATTAIN model, which is designed to enhance mental health screening and link to services for autistic youth at risk for co-occurring mental health conditions.</p>	<p>Sample: Primary care providers (PCPs) who participated in the ATTAIN optimization pilot. Setting: The study was conducted in a Federally Qualified Health Center (FQHC)</p>	<p>Data Collection: Qualitative data from provider, interview, quantitative data from electronic health records, demographic, and professional background information</p> <p>Measure: Pediatric Symptom Checklist-17 (PSC-17): to identify clinically concerning mental health symptoms in children., feasibility of Intervention Measure (FIM):measure assesses the extent to which participants perceive the ATTAIN intervention as feasible in their care setting., acceptability of Intervention Measure (AIM):evaluates the acceptability of the ATTAIN intervention, perceived Characteristics of Intervention Scale (PCIS):to assesses providers' attitudes towards the ATTAIN intervention, measure of Innovation-Specific Implementation Intentions (MISII) which measured providers' intentions to continue using the ATTAIN program post-pilot</p> <p>Follow-Up: Follow up with families regarding appointment status Follow up with providers for feedback</p>	<p>Findings: A total of 18 eligible patients were screened using the Pediatric, resulting in a 100% reach rate. Of these, 9 patients (53%) were already receiving care through the FQHC's Behavioral Health department, while 47% were referred to care coordination. All patients who were referred for care coordination successfully scheduled and attended a behavioral health appointment. The adoption rate of the ATTAIN program was 100%, with providers expressing favorable perceptions of its feasibility and acceptability.</p>	<p>Strengths The ATTAIN program was adopted by trained providers with a 100% adoption rate, they reported finding it practical and beneficial. It successfully linked patients to mental health services, with 100% of referred patients scheduling and attending appointments. The FRAME-IS framework allowed for adaptations within the FQHC context. However, the small sample size and challenges in engaging the broader clinic team may limit the generalizability of the findings.</p>	<p>Conclusion: The ATTAIN program, implemented in pediatric primary care, was found to be feasible and acceptable within clinical workflow. It reached 100% of identified patients using the Pediatric Symptom Checklist-17. The FRAME-IS framework was used to adapt implementation strategies, enhancing its fit within the Family Quality Health Center (FQHC) context. The study recommends ongoing training, support, and bi-weekly review meetings for scaling and sustaining the program.</p>
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<p>Dreiling et al., 2022</p>	<p>Design A pilot study</p> <p>Purpose: To increase provider self-efficacy, knowledge of ASD, and critical thinking skills through structured training and support.</p>	<p>Sample: The sample consisted of 86 mental health providers from North Carolina who signed up to participate in the Project ECHO Autism program</p> <p>Setting: The program was conducted across 27 counties in North Carolina, with a focus on both urban and rural areas.</p>	<p>Data Collection: Data collection in the study involved pre- and post-assessment measures completed by the participating mental health providers.</p> <p>Measures: Self-Efficacy Questionnaire to assess providers' confidence in their ability to assess and treat co-occurring mental health conditions in autistic children and adolescents. ASD Knowledge Survey to measure providers' understanding of autism prevalence, symptomatology, service acquisition, and evidence-based treatment options. Critical Thinking Skills Assessment in which providers identified ASD-specific evidence-based strategies to address mental health concerns. Follow up: Follow up planned to assess the maintenance of provider knowledge gained over time.</p>	<p>Findings: The Project ECHO Autism training program improved mental health providers' confidence in assessing and treating conditions like ADHD, anxiety, and challenging behaviors in autistic children and adolescents. Post-test scores showed enhanced competence in understanding autism prevalence, symptomatology, and evidence-based treatment options. Participants also showed increased critical thinking skills, identifying more ASD-specific strategies. Mental health providers reported high satisfaction with the program, indicating its benefits for professional development.</p>	<p>Strengths: The Project ECHO Autism program significantly improved mental health providers' self-efficacy, knowledge, and critical thinking skills related to autism and co-occurring mental health conditions. The tele-mentoring model made the training accessible and flexible, allowing providers from rural and remote areas to access high-quality training without travel. The program received high satisfaction rates and had the potential to improve access to care for autistic individuals, addressing significant gaps in service provision. However, limitations include the lack of a control group, potential bias due to self-report measures, limited generalizability due to the sample being drawn from North Carolina, and short-term follow-up.</p>	<p>Conclusion: Participants showed improved understanding of evidence-based strategies for managing challenging behaviors, increased confidence in coping with patient aggression, and found the training comprehensible and beneficial. However, they expressed a need for additional training to fully prepare for implementing the strategies learned.</p>
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<p>Donnelly et al., 2023</p>	<p>Design quasi-experimental design</p> <p>Purpose: To evaluate the impact of a brief training on healthcare professionals' knowledge, comfort, and confidence in implementing evidence-based strategies for managing challenging behaviors in individuals with ASD</p>	<p>Sample: The sample consisted of 308 attendees across various training sites</p> <p>Setting: The training was conducted across multiple sites, including public hospitals and shelter systems</p>	<p>Data Collection: Anonymous, written questionnaires administered to attendees before and after the training sessions</p> <p>Measures: The effectiveness of the training program on knowledge, confidence, and perceptions regarding challenging behaviors in individuals with autism spectrum disorder (ASD) Satisfaction Ratings to gauge the effectiveness of the program and the perceived value of the training provided.</p> <p>Follow-Up.: None</p>	<p>Findings Participants reported significant improvements in their knowledge and confidence regarding autism and evidence-based practices (EBPs) Approximately 90% of participants indicated that they had "learned something useful" from the case presentations Overall satisfaction ratings from post-session surveys were high, with many participants stating that the sessions contributed positively to their understanding of working with autistic individuals. The variety of topics covered in the ECHO sessions reflected the diverse needs of rural healthcare providers. The ECHO model facilitated peer-to-peer interaction leading to novel insights Participants indicated intent to apply the suggestions and strategies discussed during the sessions in their work with clients.</p>	<p>Strengths The ECHO model is a trainee-led approach that aims to provide specialized knowledge to rural healthcare providers. It fosters a collaborative environment where providers can share experiences and insights. The model covers diverse topics, particularly behavioral supports, and is cost-effective compared to traditional training methods. However, there are limitations, such as a lack of follow-up measures to assess the long-term impact of the training on clinical practice and patient outcomes, and the effectiveness of the sessions may vary based on participants' prior knowledge and experience. Additionally, technical challenges may arise with telehealth and videoconferencing. I services, which can impact their ability to implement the strategies learned during the ECHO sessions.</p>	<p>Conclusion Participants showed improved understanding of evidence-based strategies for managing challenging behaviors, increased confidence in coping with patient aggression, and reported increased engagement and willingness to implement learned strategies post-training, as the training was rated as comprehensible and appealing. Participants expressed a need for additional training to feel fully prepared to implement the strategies learned.</p>
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<p>Mazurek et al., 2024</p>	<p>Design Mixed methods design</p> <p>Purpose The purpose of the study was to improve access to care, facilitate parent-provider partnerships, and provide resources and support to families navigating the autism service system</p>	<p>Sample 42 PCPs primary care physicians and practitioners (PCPs)</p> <p>Setting Various locations in Virginia are participating in the ECHO Autism LINKS program.</p>	<p>Data Collection: Participant survey</p> <p>Measures: Satisfaction survey after the training with quantitative and qualitative questions to assess overall perceptions of the program</p> <p>Pre- and Post-Training assessments to measure changes in confidence regarding autism screening and care .</p> <p>Open-ended text responses to understand participants' reasons for referrals and primary concerns.</p> <p>.Follow up. None</p>	<p>Findings The ECHO Autism LINKS program improved PCPs' knowledge and confidence in autism screening, identification, and managing co-occurring symptoms. Participants sought support for managing symptoms and identifying resources. 258 families were referred for direct family navigation services, with 76% needing ongoing support. The ECHO Autism LINKS resource library was used by 80.7% of participants, with 96.3% likely to use it in the future.</p>	<p>Strength The program improved the learning experience for Pediatric Care Practitioners (PCPs) by combining didactic learning with case-based discussions and collaborative problem-solving. It improved knowledge and practice among PCPs and addressing family needs. The program focuses on managing co-occurring medical and psychiatric conditions among children with autism, reflecting a comprehensive approach to care. However, limitations include a limited number of participants, lack of a control or comparison group, focus on immediate outcomes, absence of direct measures related to outcomes, and potential bias in self-reported measures. Further research is needed to investigate the program's cost-effectiveness and sustainability.</p>	<p>Conclusion Participants reported better skills in screening, identifying, and managing autism, as well as increased confidence in families referring to community services. PCPs expressed strong satisfaction with the program, stating it met their educational needs and provided valuable resources. Family navigators were identified as crucial for addressing families' complex needs and enhancing access to services. The program aimed to tackle systemic issues in autism care, such as provider shortages and fragmented services, which contribute to delays in diagnosis and intervention. The study called for more research to assess long-term outcomes for children and families, as well as the program's cost-effectiveness and sustainability.</p>
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<p>Mazurek et al., 2020</p>	<p>Purpose To determine if the Extension for Community Health Outcomes (ECHO) telemonitoring model is effective in improving clinical practice among primary care clinicians caring for children with autism</p> <p>Design - randomized clinical trial</p>	<p>Sample: 148 participants (PCPs [family practice physicians, pediatricians, nurse practitioners, and physician assistants])</p> <p>Setting: unknown</p>	<p>Data collection: Data was collected from participants and patient records.</p> <p>Measures: Data extraction on autism screening practices and comorbidity management from chart</p> <p>Test administered to determine knowledge level</p> <p>Self-report survey to determine self-efficacy at baseline, post echo training and three months follow up</p> <p>Follow up: Three month follow up</p>	<p>Findings: Significant changes in autism screening and treatment of comorbidities in children with autism were not observed. Participants demonstrated significant improvements in knowledge (9%; 95% CI, 4-13; $P < .001$) and self-efficacy (29%; 95% CI, 25-32; $P < .001$).</p>	<p>Strengths A large, multisite, and geographically diverse sample of PCPs was utilized, which enhanced generalizability. Randomization at the level of cohort, staggered implementation of the program across cohorts, and tests of effectiveness under baseline, intervention, and follow-up conditions.</p> <p>Limitations Participants were motivated to improve their care of children with autism and may not be representative of the larger population of PCPs.</p> <p>Multiple participants from the same practice were prohibited to minimize confounds. The authors did not assess if PCPs were actively screening for each condition. The extent to which comorbid conditions were accurately screened and identified was difficult to determine.</p>	<p>The ECHO model was created to increase access to high-quality health care for underserved patients with autism and ASD. The findings provided support for the ECHO model in improving clinician knowledge and confidence. The model is effective in improving clinical practice change.</p>
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<p>Cardon et al., 2022</p>	<p>Design: Systematic review</p> <p>Purpose: To synthesize existing evidence regarding healthcare professionals' knowledge, self-efficacy, and attitudes towards autism. Specifically, it aimed to assess the level of autism-related knowledge among healthcare providers, explore their confidence and attitudes in working with autistic individuals, and identify potential gaps or areas for improvement in training and awareness.</p>	<p>Sample: reviewed studies consisted of a diverse range of healthcare professionals and students from various countries. Specifically, the studies included medical students, occupational therapists, nurses, general practitioners, unspecified doctors, psychiatrists, physiotherapists, psychological therapists, speech and language therapists, nursing students, and psychology students.</p> <p>Setting:</p>	<p>Data Collection: studies primarily involved self-report measures and structured interviews.</p> <p>Measurement standardized and validated tools to assess healthcare professionals' knowledge, self-efficacy, and attitudes towards autism.</p> <p>Follow-Up None</p>	<p>Findings The findings across the reviewed studies indicate that healthcare professionals generally possess low to moderate levels of knowledge, self-efficacy, and attitudes towards autism. Specifically, knowledge scores ranged widely, with many studies revealing substantial gaps mean scores on measures like the KCAHW ranged from 47% to 71% correct answers, signifying room for improvement</p>	<p>Strengths: The strengths of the reviewed studies include the use of systematic search strategies, high inter-rater reliability in study selection ($\alpha = 99.01$), and the application of a tailored quality assessment tool to evaluate methodological rigor.</p> <p>Limitations Many studies relied on self-report measures, which can be subject to bias, such as social desirability or overestimation of knowledge.</p>	<p>Conclusion The review concludes that healthcare professionals possess only moderate knowledge and self-efficacy regarding autism and often lack autism-specific training, which can serve as significant barriers to effective care for autistic individuals.</p>
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		studies varied, encompassing healthcare environments such as hospitals, clinics, primary care facilities, and educational institutions				
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Appendix C

Recruitment email

Dear Washington, Medical Clinic Provider,

My name is Odette Ndzelen, and I am a graduate nursing student from Washburn University. I am writing to invite you to participate in my quality improvement project. The purpose of this project is to enhance healthcare providers' understanding of evidence-based management of Autism Spectrum Disorder (ASD) through structured training sessions and access to standardized care processes for assessment, referral to needed resources, and documentation in the outpatient clinic. As a direct care provider for patients with ASD at Washington Medical Clinic, you are eligible to participate in this project. I am contacting you with the permission of your clinic director.

If you decide to participate in this project, you will be asked to sign a written consent form prior to your involvement. After giving consent, you will complete an anonymous pre-test survey, which is expected to take 10-15 minutes. Following this, you will be provided with information to register and attend a virtual training presentation, which will last approximately 90 minutes. About two weeks after the presentation, you will be asked to complete an anonymous post-test and satisfaction survey, which will also take 10-15 minutes. All survey information will be collected through SurveyMonkey anonymously, using a unique identifier rather than personal information to maintain confidentiality.

In addition, you will be required to utilize the referral workflow, resource guide, and documentation tool in the electronic health record, which are designed to assist in the assessment, management, and referral of patients with ASD, thereby enhancing care quality and communication. No compensation will be provided. All tests will be anonymous, and participation will involve no additional risks beyond what you would normally encounter in daily activities.

Please be advised that your participation is completely voluntary. If you would like to participate, please indicate your willingness by signing the consent form and follow the link for the pretest survey. If you have any questions about the project, please feel free to email or contact me at Odette. Ndzelen@washburn.edu/2406466267

Thank you kindly,

Odette S Ndzelen

Appendix D

WASHBURN UNIVERSITY
1700 SW College Avenue
Topeka, KS 66621

Informed Consent for Quality Improvement Project Participation

The Washburn University Department of Nursing supports the practice of protection for human subjects participating in quality improvement projects. The consent form will be reviewed with you so that you can make an informed decision about whether to participate in the project. If you agree to participate, you are free to withdraw at any time without penalty.

Title of Research Project: Promoting Autism Disorder Evidence Based Care: Protocols for Assessment, Specialty Referrals and Documentation
Institutional Review Board #25-11
Approval Date: pending

Aim or Purpose: The aim of this project will be to create system change in the management of autism spectrum disorder (ASD) by identifying existing local resources, educating primary care providers on available resources, and changing assessment, referral, and documentation protocols to reflect this change in practice in the outpatient clinic.

Description of Project: You are being asked to volunteer to participate in a project designed to improve healthcare providers' understanding and management of ASD. As part of this project, you will complete short questionnaires, participate in the training, and use new processes and protocols for assessment and referral to needed resources. The project will involve a small group of six healthcare providers caring for autistic patients in the outpatient clinic and is expected to last about 6-8 weeks in total. Your participation is voluntary, and all responses will be kept confidential.

Participation Requirements: If you decide to participate in this project, you will be asked to sign this consent form and complete an anonymous pre-test survey which is expected to take 10-15 minutes. Then you will be provided with information to register for and attend a virtual training presentation which is approximately 90 minutes long offered by the Extensions of Community Healthcare Outcomes (ECHO) which utilizes technology to amplify best practices for ASD. About two weeks after the presentation, you will be asked to complete an anonymous post-test and satisfaction survey which will take 10-15 minutes. All survey information will be completed through SurveyMonkey anonymously and through a unique identifier rather than personal information to maintain

confidentiality. In addition, there will be required use of the referral workflow, resource guide, and documentation tool in the electronic health record that are designed to assist in the assessment, management, and referral of patients with ASD, enhancing care quality and communication.

Potential Risks: All tests will be anonymous, and participation would involve no additional risks beyond what would normally be encountered in usual daily activities.

Potential Benefits: By participating, you will gain valuable insights into ASD, enhancing your skills in screening and managing patients with this condition. Although there is no monetary compensation for your participation, the interactive format of the ECHO autism program promotes collaboration and peer learning. This will enable you to share experiences, gain new insights, and enhance your professional development, which can benefit your career advancement. Furthermore, the results of this research could enhance care for other ASD patients by refining training and resources for healthcare providers with the knowledge gained. Participants will receive the project results via email, keeping you informed of how your participation contributes to the advancement of ASD understanding and management.

Confidentiality of Data: Information obtained will be used for research, quality improvement, and/or educational purposes. Only the investigators will have access to the data. Personal identifiable information will be maintained privately and without identification during and after the project is completed. All data will be securely stored for three years after completion of data collection and then fully deleted. Be assured that your name will not be associated in any way with the research findings.

Contact Information: Do not hesitate to ask any questions about the project. Should you have any questions or concerns about this project, contact the Primary Investigator at (2406466267/Odette.ndzelen@washburn.edu). Should you have questions about your rights as a research participant, contact the chair of the Institutional Review Board at irb@washburn.edu

Participation is Voluntary: Your participation is solicited, but strictly voluntary. If you agree to participate, you can stop participating at any time. Your decision not to answer one or more questions or to stop responding altogether will not affect your current or future job prospects in any way. We appreciate your cooperation very much.

Odette S Ndzelen

Consent/Permission to Participate in the Research Project:

By signing this document, I agree to participate in this project. I agree that I was given a chance to ask questions to fully understand why the project is being performed and how it will affect me. If I have questions about the project after signing this document, I can contact the Primary Investigator.

Participants Legal Name (print): _____

Signature: _____ Date(mm/dd/yyyy) _____

Appendix E Demographic Data

Question Title

1. What is your age group?

25–39 years old

40–58 years old

Question Title

2. What is your specialty?

PMHNP

NP

Psychologist

Question Title

3. How many years have you been practicing at the outpatient clinic?

Less than 1 year

1-3 years

4-6 years

7-10 years

More than 10 years

Done

Survey link: <https://www.surveymonkey.com/r/SPFRB8T>

Appendix F1/F2
Pretest-Survey and Posttest-Survey

Question Title

1. How confident are you in your ability to assess patients for ASD?

Very confident

Fairly confident

Not very confident

Not at all confident

Question Title

2. How confident are you in the use of screening tools to diagnose ASD?

Very confident

Fairly confident

Not very confident

Not at all confident

Question Title

3. How confident are you in your knowledge of existing community resources for the management of ASD?

Very confident

Fairly confident

Not very confident

Not at all confident

Question Title

4. How confident are you in the management of communication, social interaction, and behavioral needs of a patient with ASD?

Very confident

Fairly confident

Not very confident

Not at all confident

Question Title

5. How confident are you in collaborating with other healthcare providers to create a comprehensive treatment plan tailored to the individual needs of a patient with ASD?

Very confident

Fairly confident

Not very confident

Not at all confident

Question Title

6. How confident are you in the management of co-occurring mental and medical conditions common to patients with ASD?

Very confident

Fairly confident

Not very confident

Not at all confident

Question Title

7. How confident are you in your knowledge of referring patients with ASD to community resources?

Very confident

Fairly confident

Not very confident

Not at all confident

Done

Survey link: <https://www.surveymonkey.com/r/F93SYMW>

Appendix G

Chart Audit Tool

	Diagnosis of ASD documented	Assessment tool used to determine the need for further evaluation or intervention	Referral to specialty care or needed resources	Documentation of treatment plan, barriers, and outcome
Date of visit: Patient ID: Provider ID: Provider type:				
Date of visit: Patient ID: Provider ID: Provider type:				
Date of visit: Patient ID: Provider ID: Provider type:				

Appendix H Feedback Survey

Question Title

1. How satisfied were you with the training session overall?

Very satisfied

Satisfied

Dissatisfied

Very dissatisfied

Question Title

2. How useful is this training to your area of practice?

Very useful

Somewhat useful

Not so useful

Not at all useful

Question Title

3. How confident do you feel in applying the knowledge gained from the training to your practice?

Very confident

Fairly confident

Not very confident

Not at all confident

Question Title

4. What suggestions do you have for improving future training sessions?

Question Title

5. Any additional comments or feedback?

Survey link: <https://www.surveymonkey>

Appendix I

Training sessions for ECHO autism program

ECHO Autism | Primary Care

Sessions: Year Round

WHEN: 1st and 3rd Wednesdays | 11:45 am – 1:15 pm CT

AIM: ECHO Autism: Primary Care aims to increase local access to community-based Primary Care physicians and practitioners delivering the best practice screening, early identification, and management of medical and psychiatric comorbidities with additional training and expertise in diagnosis autism in young children with unambiguous symptoms.

NOTE: This program is an effort by our sister-superhub, Missouri Telehealth Network (MTN). **Please complete the registration and select AUTISM.** After registration is complete, instructions on how to join the ECHO sessions will be shared by email.

HUB TEAM:

- Pediatrician who specializes in development and behavior Child & Adolescent Psychiatrist
- Clinical Psychologist
- Registered Dietitian
- Resource Specialist
- Parent of a child on the spectrum

INTENDED AUDIENCE: Primary Care Physicians & Nurse Practitioners

[Register Now](#)

**Appendix J
Resource Guide**

Service provider	Services provided	Requirements	Contact information
Maryland Early Intervention and Special Education Services	<ul style="list-style-type: none"> -Family training, counseling, and home visits -Special instruction -Speech-language pathology and audiology services -Occupational therapy -Physical therapy Psychological services -Assistive technology devices and services 	A 25% delay in one or more of the following areas: cognitive, physical, communication, social or emotional, or adaptive	Phone number: (410) 767-0238. Email: antoine.hickman@maryland.gov, monique.wiggins@maryland.gov, kenneth.hudock@maryland.gov, and bmorrison@msde.state.md.us.
The Autism Waiver	The Autism Waiver (AW) provides community-based, long-term, person-centered therapeutic services and support to eligible children and youth with Autism Spectrum Disorder (ASD) to enable home and community living as an alternative to institutional care.	<ul style="list-style-type: none"> -Diagnosis of ASD. Resident in Maryland. -Have an Individualized Educational Program (IEP) or Individualized --- Family Service Plan (IFSP) with at least 15 hours per week of special education and/or related services. 	Contact autism waiver registry at 866-417-3480

		<ul style="list-style-type: none"> -Able to be served and safely maintained in the home and community with AW services; and -Monthly income may not exceed 300% of SSI benefits, and their countable assets may not exceed \$2,000 or \$2500 (depending on eligibility category). 	
APPS (Autism Program Planning Success for Employment)	APPS assists job seekers with Autism with self-determination and employment readiness skills and driver education	<ul style="list-style-type: none"> - Documentation of Autism -Completion of high school requirements -An interview with program staff -Ability to participate in all APPS programs and community activities with little supervision 	dors.maryland.gov
Pathways	Pathways offer workshops, trainings, and recreational events	<ul style="list-style-type: none"> -Have a documented diagnosis of Autism. 	dors.maryland.gov

**Appendix K
Resource referral workflow**

Step	Completed	Description	Yes/No
1	PCP	ASD confirmed in medical record/chart.	
2	PCP	Complete assessment need for <ul style="list-style-type: none"> • Behavioral therapy (Behavior Analysis) • Speech and language therapy • Occupational therapy • Social skills training • Respite services • Transition into adulthood planning 	

3	PCP	Document need and services offered in HER	
4	PCP	Complete and offer a referral to mental health services.	
5	PCP	Document referral and family's acceptance or declination of referral.	
6	Medical assistant	Contact the family on a set frequency to support scheduling mental health appointment and follow up on referral to needed resources	
8	Medical assistant and family	Schedule and attend mental health/resource appointment	
9	Medical assistant	Send a confirmation to referring provider when mental	

		health/resource appointment is scheduled or Attended	
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DNP PROJECT DEFENSE



Promoting Autism Spectrum Disorder Evidence Based Care: Protocols for Assessment, Specialty Referral and Documentation

Purpose: This quality improvement project aimed to enhance nurse practitioners' (NPs) knowledge, confidence, and consistency in Autism Spectrum Disorder (ASD) assessment, referral, and documentation through standardized, evidence-based protocols in a multidisciplinary outpatient clinic.

Methods: To accomplish this, a quasi-experimental pre/post design guided by the Plan–Do–Study–Act (PDSA) model was used, six NPs completed ECHO Autism training and implemented EHR-embedded ASD workflows. Data were collected through provider surveys and chart audits.

Results: Post-intervention, provider confidence scores increased from moderate (M = 2.67–3.00) to high (M = 4.00). The use of ASD implemented EHR-embedded ASD workflow increased from 0% to 100%, referral completion from 21.7% to 100%, and documentation completeness from 30.4% to 92.9%.

Implications: Combining ECHO Autism education with standardized EHR templates improved provider competence and care coordination. This model supports sustainable, NP-led quality improvement and promotes equitable, patient-centered ASD care.

Name:

Odette Ndzelen

Program of Study:

Doctor of Nursing Practice

Location:

<https://tinyurl.com/2k3bw67w>

Specialty:

Psychiatric Mental Health

Date:

Monday, November 24, 2025

Committee Members:

Dr. Cynthia Hornberger

Dr. Delaine Smith

Time:

1:00 pm – 2:00 pm CST