

Educating Anesthesia Providers about Autism Spectrum Disorder

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Abstract

Healthcare providers (HCPs) who are well-versed in their patients' conditions can undoubtedly give better care. Due to the increase in access to care, clearer diagnostic criteria, and streamlining of several diagnoses, autism spectrum disorder (ASD) is being more frequently diagnosed today. The nature of anesthesia is particularly impactful for patients who are autistic as the senses are manipulated, the environment is ever-changing, and interpersonal interactions can be stressful. Educating anesthesia providers about ASD is imperative for their practice. By better understanding ASD, providers can give more appropriate and equitable care. Through a posttest survey, most anesthesia providers stated they lacked confidence in providing care to autistic patients prior to the presentation. After the presentation, the providers felt more confident in caring for ASD patients.

Keywords: Autism Spectrum Disorder, Anesthesia, Accommodations, Anesthetic Implications

Clinical Relevance: Through delivering an educational presentation about ASD to a group of anesthesia providers at their monthly meeting and obtaining a survey afterward, it was ascertained that the information was much needed and benefitted those providers. The autistic patients and their families will indirectly benefit by having providers who are better prepared to understand and accommodate their needs.

Introduction

The diagnosis of autism spectrum disorder (ASD) has increased dramatically over the last 20 years, with rates now reported as high as 1 in 36 children by the age of eight (Maenner et al., 2023). One of the Healthy People 2030 initiatives from the Office of Disease Prevention and Health Promotion recommends that more children be screened appropriately for ASD by the age of 35 months (Healthy People 2030 Custom list, 2023). The collective need for support and inclusion for ASD patients continues to evolve, inviting further research into the needs and experiences throughout an autistic person's lifespan.

Healthcare providers must provide evidence-based, patient-specific care for their populations. According to the *Diagnostic and Statistical Manual of Mental Disorders* (DSM), the needs of ASD patients are a challenge concerning appropriate patient or caregiver teaching, modification of the plan of care, and prevention of traumatic experiences (5th ed.; DSM-5; American Psychiatric Association [APA], 2013). Autistic patients desire consideration from healthcare providers regarding their plan of care (Doherty et al., 2022). Autism spectrum disorder is more frequently diagnosed and better understood with each passing year, amplifying that it is time for all healthcare providers to increase their knowledge, skills, and behaviors related to the care of autistic patients.

Autistic children are 3.42 times more likely to have a difficult anesthesia induction than their neurotypical counterparts (O'Brien et al., 2023). They are also five times more likely to require a child life specialist (CLS) or caregiver present for anesthesia induction. This Doctor of Nursing Practice (DNP) project aimed to deliver an educational presentation to anesthesia providers at a tertiary care center in North Carolina (NC). Improving provider knowledge would, in turn, improve the care provided to autistic patients and the patient experience.

Autism spectrum disorder becomes evident in early childhood with manifestations in social communication problems and repeated stereotypical behaviors (APA, 2013). Since its first description in the 1940s, the name and diagnostic criteria have evolved to include severity levels of need from one to three. These three levels indicate the degree to which an autistic person requires support services, ranging from ASD level one with the least amount of needs, ASD level two with moderate needs, and ASD level three with profound needs. The word spectrum describes the varying manifestations in the specific sensory, physical, behavioral, intellectual, and social communication differences unique to each autistic person. One person may have profound sensory challenges and above-average intellectual capacity, whereas another might have significant physical dependence and intellectual deficits. Those examples demonstrate the range of differences, but each person with ASD is entirely different from the next. Autism is a multifaceted spectrum with varied presentations that require providers to adapt care.

Autistic patients are susceptible to fears and anxieties associated with the perioperative process, but they may communicate these difficulties uniquely (APA, 2013). Autistic people usually prefer sameness and routines. Stereotypical behaviors may become more exaggerated under duress. Flapping, echolalia, overreaction or underreaction to events, and intolerance for sensory inputs are all examples of stereotypical behaviors that autistic people may exhibit. Difficulties with sensory inputs include all five senses: olfactory (smell), auditory (sounds), visual (sights), tactile (touch), and gustatory (taste). Providers may receive the same question repeatedly; they may notice the patient distracted by smells or tactile sensations, or they frequently mention their special interest. Another essential facet of ASD is that the person might have difficulty understanding verbal instructions, expectations, or descriptions. They may have difficulties with intellectual functioning, verbal ability, or communication. All these traits come

together to present a challenge to anesthesia providers who must quickly assess their patients along with any individual needs prior to initiating care.

Sensory difficulties and a desire for routines present a problem in healthcare settings that can result in an autistic patient becoming anxious, uncooperative, and even combative (Penna et al., 2022). Even small changes in routine can be upsetting for autistic individuals. Having sedation, anesthesia, a procedure, or surgery is a major change from a routine day. It is essential to manage these behaviors to maintain safety for all present. There are various ways to approach this goal, both pharmacological and nonpharmacological. Research into supporting the ASD patient population is becoming more prevalent in both avenues.

Difficulties experienced by autistic patients with healthcare

Throughout the lifespan, autism complicates the way healthcare is delivered (Doherty et al., 2022). According to adult autistic individuals, most of society does not understand them and cannot functionally interact with them daily. Discerning symptoms in an autistic patient, along with the cause of distress, can be a significant challenge due to baseline behavior mannerisms clouding the picture. One example described by Liu et al. (2018) is that pain management for autistic patients is complex, and no pain assessment tool is designed and supported for this patient population. Similarly, no current anxiety rating scale is autism-specific (Whippey et al., 2019).

Autistic adults report having significant challenges obtaining appropriate healthcare. Doherty et al. (2022) studied these obstacles experienced by autistic adults and tabulated these problems through a survey. While this study focuses on primary care, the topics apply to many healthcare settings, and the discussion demonstrates that responses from autistic adults are very different from those of neurotypical adults. One aspect expressed was that autistic individuals

may not be able to articulate their thoughts aloud during conversation. However, many can achieve this when writing or reading material such as this survey because no human interaction is involved. Disparities were reported by autistic adults in the ability to plan care, communication with providers, sensory overwhelm, and the stronger likelihood of adverse experiences with healthcare in the past.

Based on the responses in Doherty's survey, communication barriers occurred while making appointments, discussing concerns with providers and staff, describing symptoms, and having the time to process a conversation (Doherty et al., 2022). Sensory difficulties come into play with many aspects of healthcare settings, such as loud noises, bright lights, unpleasant smells or tastes, and enclosed spaces with other people. This is in addition to the actual exam or procedure taking place. Given that autistic children are generally less able to cooperate than neurotypical children, many adults who are autistic may have unpleasant memories of past healthcare experiences. They may have been restrained for parts of their healthcare at a young age or experienced procedures they did not understand, leading to psychological trauma. This predisposes them to increased fear and avoidance of receiving care. Due to these problems, Doherty et al. (2022) discovered that many autistic adults had poorly managed conditions despite a strong belief that their health was important.

Difficulties healthcare providers encounter with autistic patients

Just as autistic patients have trouble during healthcare interactions, so do the providers. Since the diagnostic criteria and labeling have changed for ASD, healthcare providers (HCPs) may have out-of-date or have minimal knowledge of ASD to begin with. Both parties are at a disadvantage when the provider is limited in their knowledge of a patient's condition. Healthcare providers have been surveyed about their knowledge and ability to care for autistic patients.

These providers, who practiced in many settings and specialties, stated that caring for autistic patients of any age was challenging for several reasons (Morris et al., 2019). The barriers stated were a lack of coordinating support services, no compensation for additional time spent, deficient knowledge, and difficulty communicating with autistic patients. When the healthcare setting itself is disturbing to autistic patients, HCPs are immediately at a disadvantage when working with this patient population. The combination of barriers on both sides creates a situation where both HCPs and autistic patients are dissatisfied with the process.

Design

Conveying useful information about a condition is vital to educational presentations. The information presented must be thorough and applicable but also succinct and memorable. The areas of interest for this presentation were diagnostic criteria of ASD, manifestations of ASD, difficulties experienced by autistic patients with healthcare, difficulties healthcare providers encounter working with autistic patients, nonpharmacologic measures to improve the anesthesia experience for autistic patients, and pharmacologic management specific to anesthesia for autistic patients. By incorporating all the elements that anesthesia providers need, both their general and specific knowledge of ASD was addressed by the presentation.

Organizational Needs Statement

The organization related to this Doctor of Nursing Practice (DNP) project was an anesthesia group that serves a large tertiary care center in North Carolina (NC). They employ over one hundred anesthesia providers for this location and serve as the primary clinical site for a DNP nurse anesthesia program. The company aims to continue providing high-quality, evidence-based care to its population. They seek advances in technology and educational opportunities for their clinicians to meet the needs of a complex patient population. This site's

patient population is culturally and socioeconomically diverse and includes patients with a wide variety of conditions, including autistic patients of all ages and levels. Autistic patients have unique developmental and communicative needs that should be included in the plan of care.

Autistic patients come to this facility requiring anesthesia for various surgeries, and their needs may range from additional perioperative education to extensive developmental and physical considerations. While the hospital employs child life specialists (CLS) who assist with much of this individualized care for children, these specialists do not take part in caring for adult autistic patients. Additionally, the CLSs are rarely available in the peri-anesthesia setting during evenings and weekends. Thus, there are many instances where anesthesia providers may care for an autistic patient without the support of a CLS. Given that a CLS may not be available, anesthesia providers are responsible for understanding autism and how to tailor care for this patient population.

National benchmarks, called Healthy People 2030, are outlined by the Office of Disease Prevention and Health Promotion. These initiatives are pertinent to the entire country and focus on improving the health and well-being of all Americans (Office of Disease Prevention and Health Promotion [ODPHP], n.d.). The following initiatives apply to ASD patients as children: “increase the proportion of children with autism spectrum disorder who received special services by age four years MICH-18,” and “increase the proportion of children who receive a developmental screening MICH-17” (ODPHP, n. d., Custom List). In addition to the autism-specific objectives, many other Healthy People 2030 goals could also impact an autistic person during their lifetime. The broader initiatives range from preventing psychological distress in adults with disabilities, caregiver well-being, improving educational systems for children with disabilities, and increasing access to care for people with disabilities. There are also Healthy

People 2030 benchmarks for related needs that frequently occur along with autism, such as attention deficit hyperactivity disorder (ADHD) and the number of people living in group homes. Healthy People 2030 has 358 objectives, 14 of which apply to increasing the quality of life for autistic people in our country. The unmet needs of autistic people are clearly a concern in the United States of America (USA) based on this data.

Problem Statement

Clinicians need current, applicable knowledge to provide high-quality, patient-centered care. Providing care to autistic patients is a challenge to anesthesia providers as this patient population has complex needs. This DNP project site encounters a high frequency of both pediatric and adult autistic patients of all severities. The providers for this company need a broad knowledge base so they can meet the needs of their autistic patients.

Purpose Statement

The clinical partner for this project strives to provide high-quality subspecialty care. A better working knowledge of autism spectrum disorder will prepare providers to interact with these patients to assess their needs more wholly and adapt care as needed. Giving providers the knowledge and tools to tailor care for the ASD population aligns with this company's mission. This DNP project aims to educate providers in this anesthesia group about anesthetic-related challenges for autistic patients through a formal educational presentation.

Literature Review

Reviewing current literature is paramount to developing knowledge of a topic. The literature review for this DNP project utilized OneSearch, PubMed, and PsycINFO database searches. All searches included limits to five years, peer-reviewed, scholarly work, and English language. The university online book retrieval was used to obtain the most recent version of the

APA DSM manual. A report on recent ASD diagnostic patterns in the USA was obtained from the Centers for Disease Control (CDC) website. Lastly, two sources were obtained from the Office of Disease Prevention and Health Promotion (ODPHP) website under the Health People 2030 (HP 2030) initiatives. The first source is an overview of HP 2030 as a program, and the second is a custom list created by the author of fourteen initiatives that apply to the autistic population.

To obtain specific bodies of knowledge to support the intervention, each search had keywords tailored to resources relevant to the database being used. A OneSearch using the keywords anesthesia AND autism AND induction yielded 25 results. Of these results, eight resources were kept. Excluded articles concerned with sedation and thiopental, as well as articles that had no relation to providing anesthesia. A PubMed search with key terms anesthesia, medication, and autism found 77 results. Of these 77 articles, ones that focused on genetics, vaccines, outpatient medications, obstetrical anesthesia related to the delivery of the child, and animal studies were excluded. The remaining four articles contained two duplicates from OneSearch, so only two were kept from this search. To include psychology works in the literature, a search was performed using PsycINFO with keywords autism and anesthesia, producing 18 results, and two were kept. Exclusions were articles related to obstetrical anesthesia when the patient concerned was the neonate, ophthalmic exams, receptors or genetic studies, and articles that excluded autistic persons as subjects.

Levels of evidence varied as some aspects of the educational presentation must be historical, such as the DSM V manual, and some were more appropriate primary studies on protocols or medication regimens utilized to compare outcomes. Additionally, systematic reviews and literature reviews were useful in narrowing the broad body of information on autism

down to a small enough amount of information to present to providers. Many of the useful works were qualitative due to the nature of this topic, both for the experience of the patient and the healthcare provider. All sources were read to completion to ensure no further exclusions were necessary.

Following a literature review, a synthesis of the content was created to share information concisely. The information was then organized into categories and arranged into a Microsoft PowerPoint presentation. The first half of the presentation was centered on the background, diagnostic criteria, and characteristics of ASD, as well as difficulties experienced by autistic patients and HCPs during the delivery of anesthesia. The second half of the presentation addressed measures to mitigate these difficulties, starting with nonpharmacologic and ending with pharmacologic.

Nonpharmacologic measures to improve the anesthesia experience for autistic patients

Perioperative protocols designed for autistic patients involve priority timing, additional teaching, environmental accommodations, clear identification of special needs on the surgical schedule, and utilizing providers who are willing to develop the applicable skill set (Whippey et al., 2019; Bevan et al., 2022). Priority timing usually means the first case of the day, having less time in a large, crowded waiting room and instead going straight to a quiet, preoperative area that may have lights dimmed. Child life specialists can do additional teaching, be trained to work with children on their developmental level or be trained by other staff who are knowledgeable about autism. Environmental accommodations are specific to each autistic patient and their sensory needs. Whippey et al. and Bevan et al. asked caregivers about these specific needs at pre-anesthesia appointments through a CLS, and an individualized protocol was built for each patient. Helpful accommodations included dimmed lights, quiet rooms, an absence of unpleasant

smells, allowing patients to remain in their own clothes, an intravenous line removed early in recovery, and discharge directly from the recovery room.

The specific components of additional patient teaching and rehearsal have been demonstrated to reduce the need for physical restraint in autistic children by Shibuya et al. and Mellardo-Cairel et al. (2022, 2018). Shibuya et al. enrolled patients in a structured rehearsal teaching protocol for one session and sent materials home with parents to review with patients. This teaching reduced the need for physical restraint from 51% to 13% during anesthesia induction without the use of pre-anesthesia sedation. Mellardo-Cairel et al. (2018) employed more in-depth behavior training to eliminate the need for physical restraint during inhalation induction, again, with no premedication used. This method of demonstration and practicing an activity is widely used in therapies for autistic individuals.

Pharmacologic management specific to anesthesia for autistic patients

In addition to nonpharmacological practices, other management methods include administering various sedating medications. Sedatives help alleviate anxiety for the patient, enabling them to be cared for without physical restraint and reducing the chance of remembering an unpleasant event (Penna et al., 2022). Not being physically restrained makes the experience less likely to contribute to traumatization and resistance during subsequent healthcare interactions.

Anesthesia can be induced for children via either intravenous (IV) medication or inhaled gases that render the patient unconscious. This is frequently the part that entails physical restraint of the patient and possibly the creation of memories that span from unpleasant to traumatic. Many children are given an inhalation induction to spare them the pain of having a peripheral intravenous (PIV) line placed while awake, but this entails entering the operating room first and

with or without their caregiver. This can be very scary for them. Often, children and special needs patients who do not have a PIV yet are given a pre-anesthetic sedative either orally (PO), intranasally (IN), or intramuscularly (IM) to reduce the fear and anxiety that comes with being separated from caregivers and taken to the operating room. Common medications used for pre-anesthetic sedation include midazolam, ketamine, dexmedetomidine, or combinations of these.

One comparison in anesthesia comes with how long it takes to render a patient unconscious by giving inhaled anesthetic gases through a mask. Children are typically administered sevoflurane and nitrous oxide during an inhalation induction to gain PIV access. Sevoflurane, with or without nitrous oxide, is a standard inhalation anesthetic as this anesthetic gas has the least offensive smell and is less irritating to the lungs. Kunihiro et al. (2022) studied the time for sevoflurane induction in children with developmental disabilities with the endpoint of time to PIV establishment. It was determined that developmental disabilities did not increase the time required to induce anesthesia and place an intravenous catheter when using an inhalation induction. This study controlled for confounding factors, as no sedation was given in the preoperative area.

Children are often given the anxiolytic medication midazolam orally to prepare them for inhalation induction. Hanamoto et al. (2023) set out to study the sedative effect midazolam had on both pediatric and adult autistic patients to see if it was less effective than in neurotypical patients. Their retrospective observational analysis of 390 charts showed that midazolam, whether given PO or IM at the appropriate dose for the route, achieved the same degree of sedation within 30 minutes in both autistic and neurotypical patients when controlling for chronic benzodiazepine (BZD) use. They demonstrated that midazolam has the same sedative effect on both autistic and typical patients, and only the patients receiving chronic BZD therapy

required higher doses to achieve effective sedation with midazolam. Thus, when chronic use of a BZD is present, all the patients had a lesser response to midazolam. The presence of ASD did not alter the response.

When midazolam is not enough, the use of a more complex combination of pre-anesthetic medications, including the dissociative medication ketamine, is often used. Penna et al. performed a parallel, double-blind, random controlled trial comparing oral midazolam to oral midazolam combined with ketamine in 64 autistic patients aged 2-59 years of age. They found that the group that received midazolam with ketamine had easier PIV placement with less physical restraint required (Penna et al., 2022). Adding ketamine did not extend the awakening time at the end of the procedure.

In another study, Guthrie et al. (2021a) performed a retrospective analysis comparing two groups of patients requiring IM sedation. Patients received either ketamine with midazolam IM or ketamine with dexmedetomidine IM prior to induction. The objective was to determine if the differing combinations altered recovery room times or mitigated undesirable hemodynamic side effects from ketamine. Time to the operating room, recovery time, hemodynamics, and adverse events were examined. The time to entry of the operating room was similar; the recovery time was only increased if the patient received additional dexmedetomidine IV while under anesthesia. Adverse events were minimal and not attributed to the premedication used. Hemodynamics showed lower blood pressure in the ketamine with dexmedetomidine group. This may be advantageous if a patient has medical reasons to avoid high heart rates or blood pressure.

The final study included a survey aiming to describe the most common pre-anesthetic IM sedatives used in the United States of America (USA) by dental anesthesiologists for severely

uncooperative patients, regardless of diagnostic history (Guthrie et al., 2021b). This survey showed that 98.7% of respondents included ketamine in their sedative choice, and the most common combination was midazolam with ketamine. By employing the use of these medications in this manner, severely uncooperative patients are able to have their dental health addressed without incurring traumatic memories.

Limitations to note are the lack of a homogenous patient population as several of these studies included patients unable to cooperate for many reasons, so the autistic population is only a part of those samples. Only one study was a double-blind, randomized controlled study, whereas many were retrospective chart analyses. Several studies are qualitative, with descriptive statistics as the only measure. While these are useful, more robust evidence is needed in the study of best practice management of autistic patients undergoing general anesthesia.

Materials and Methods

The purpose of DNP projects is to enact improvement initiatives in healthcare through the lens of an advanced practice nurse (Moran et al., 2014). The process of implementation must be reviewed to ensure measurable benefits to stakeholders. Throughout the implementation period, the project evolved beyond the original plans to increase the impact, which increased the number of affected providers beyond the original intention.

Framework

The RE-AIM Framework was chosen as it is commonly used in community health settings and closely applies to educational interventions such as this project (RE-AIM, 2023). For example, an educational program by Smith et al. (2020) given to preschoolers positively impacted improved knowledge and acceptance of Dementia patients. The RE-AIM framework comprises reach, efficacy, adoption, implementation, and maintenance functions. For this

project, the *reach* is represented by the anesthesia providers and preoperative staff at a tertiary care center in NC. The *efficacy* through the post-test survey responses from anesthesia providers. *Adoption* is evidenced by preparing educational presentations from the literature search with practice recommendations. *Implementation* was demonstrated in the educational presentation during the monthly departmental meeting. Lastly, the *maintenance* component is based on survey responses from anesthesia providers committing to incorporating the recommendations into practice.

Process Measures and Outcome Measures

Process and outcome measures are identified to measure how well an intervention functions and how much change it produces. The process outcomes are evidenced by anesthesia providers utilizing their increased knowledge of autism, feeling more comfortable with autistic patients, and understanding the need to incorporate accommodations into their care. The outcome measure for this project is the quality of care provided to autistic patients at this facility.

Interpersonal Relationships and Stakeholders

The relationship between the author and the site champion is fundamental to the ability to implement a DNP project at the chosen site. The author and the site champion met nine times formally and many other times informally as the project unfolded. All meetings with the site champion were in person except the last meeting, which was performed virtually as the site champion was unavailable in person.

Other meetings were held with the chief clinical anesthesiologist to arrange permission for the presentation. There were three meetings with the lead pediatric anesthesiologist to hone the presentation, talking points, and general objectives. There were two meetings with a colleague, this company's quality improvement (QI) officer, and a DNP-prepared nurse

practitioner to review strategies for success, possible data points, and a potential QI data investigation.

Presentation

Monthly department meetings at the project site typically include educational opportunities for the anesthesia providers, so this presentation went well with the usual agenda. Invitations were sent one week before and one day before the scheduled presentation to all anesthesia providers at this company to attend the presentation during the monthly meeting with the allure of a complimentary breakfast. An educational presentation lasting approximately 20 minutes was delivered to all anesthesia providers present for the meeting. The presentation covered the diagnostic criteria for ASD, clinical and social manifestations of ASD, difficulties experienced by autistic patients, difficulties experienced by healthcare providers when caring for autistic patients, non-pharmacological accommodations that are meaningful to autistic patients, and pharmacologic interventions necessary to optimize the experience of the autistic patient. After the presentation, a five-question survey was made available to all participants through a Qualtrics survey accessible from a quick reference (QR) code printed out and placed on the tables in the audience.

Continuation of the project

Following the presentation to anesthesia providers, the organization encouraged further dispersing the information about autism to sister departments. The most closely related department is the peri-anesthesia department, which comprises registered nurses and nursing assistants who care for patients before and after anesthesia. The author met with the nurse manager of this unit and arranged a presentation for this group. The educational presentation was tailored to include more applicable knowledge for the audience, focusing more on preoperative

accommodations and less on medication selection since these providers do not prescribe medications. There was an additional table included to understand the side effects and administration information for medications that might be used in the autistic and otherwise uncooperative populations to help them understand the behaviors that would be seen.

In addition to the two in-person presentations, the verbal notes were typed and added to the PowerPoint slides. Then, copies of the presentation were given to the peri-anesthesia department's nurse manager and uploaded to the unit continuing education website. The anesthesia version of the presentation was groomed in the same manner and uploaded into the group's Google Drive in the education folder so anesthesia providers unable to be present at the meeting could access the information. Providers were notified that the material was on the drive. The author was available as a recurring presence in the facility and facilitated any discussions desired by any staff member on caring for autistic patients.

The project was not designed to be a continuous mechanism, but continuing education will continue as it has at the monthly department meetings. There have been needs recognized that can be addressed in the future, such as quality improvement (QI) projects for percentages of pediatric premedication utilization compared to national benchmarks, documentation of the patient's response to pediatric inductions, parental presence for pediatric inductions, and further education on pediatric and neurodiverse conditions.

Results

Implementation Process: Successes and Barriers

The response to the implementation of my project exceeded my expectations. Attendance at the department meeting was significantly better than the typical attendance. The invitation emails were effective, and breakfast provided an added incentive for the participants. Using a QR

code made the survey accessible. Meeting with the lead pediatric anesthesiologist during the creation of the presentation helped encourage a concise and direct message. The information was condensed and zoned in on the talking points with the highest impact. These components came together to result in 35 completed post-test surveys.

The survey results are represented in Appendix C. Participants reported that a majority, 63%, were “less confident than they would prefer” in caring for autistic patients before the presentation. After the presentation, the majority, 71%, were “confident” in caring for autistic patients. Eighty-six percent of respondents reported they would very likely recommend the presentation to a colleague or applicable HCP. The presentation was rated as “excellent” by 94% of respondents, and 83% said they were “very likely” to use the information from the presentation in their practice. Clearly, the presentation was helpful and applicable to the providers in attendance.

Barriers faced while delivering the presentation were the limited attention span of the providers since it occurred at the beginning of a busy day. The time available to deliver the presentation was less than desired. This presentation could have spanned an hour but had to be shortened to accommodate the meeting parameters, undermining its effect.

Discussion

Reaping the benefits of the project

The personnel who benefitted from this project were the anesthesia providers at the site who either attended the presentation or viewed it on the group’s Google Drive. These include anesthesiologists, certified registered nurse anesthetists, certified anesthesiologist assistants, and student registered nurse anesthetists. The preoperative staff who attended in person or viewed their presentation on that unit’s drive also benefitted from the information.

The most important recipients of this intervention are autistic patients and their families who receive care at this facility. Providers who have a better understanding of ASD and how to care for autistic patients will impact this patient population and their families in a meaningful way. This improvement in care will address Healthy People initiatives to support autistic people and their caregivers.

Recommendations for future projects

Should a project on this subject matter be replicated, there are a few recommendations. Plan to deliver the presentation to more than one group of providers and on more than one occasion. Plan to share a tip sheet or PowerPoint slides afterward to reach the personnel unable to attend the in-person presentation. Send an email invitation about one week in advance to all personnel about each presentation. Send another email invitation the day before as a reminder. Create a simple, short survey with an open comment box at the end. Create a shortened hyperlink for the survey (ex. TinyURL) and a QR code to increase survey accessibility. Print the QR code out and place it on the meeting room tables. Send a thank you email to the group one day after the presentation and include the shortened hyperlink and QR code to allow more respondents access to the survey. Ask leadership members for suggestions on who would benefit from the presentation and who could be contacted to arrange it. Ensure the presentation is concise and has direct recommendations for practice. Utilize interesting PowerPoint slides with easy-to-digest phrases, with most information shared through speaking points supporting your message. Have a knowledgeable colleague who understands the audience receive the presentation and give feedback before the final draft. These aspects combined facilitate the delivery of an educational presentation to HCPs in an interesting, cohesive manner that is specific to their role.

Conclusion

Clinicians need current, applicable knowledge to provide high-quality, patient-centered anesthesia care. Healthcare providers and autistic patients have expressed the barriers to achieving quality healthcare, citing a knowledge gap for providers (Doherty et al., 2022; Morris et al., 2019). The anesthesia professionals at this project site admitted through the survey that they lacked confidence in providing care to their autistic patients. Autism Spectrum Disorder is being identified and diagnosed at an increasing frequency, which increases the likelihood anesthesia providers will know their patient is autistic, which enables them the opportunity to accommodate their patient's needs (Maenner et al., 2023). Having anesthesia providers who are familiar with the needs of autistic patients is meaningful support for this patient population (Bevan et al., 2022; Whippey et al., 2019).

Through delivering a thorough review of ASD and anesthetic considerations, anesthesia providers reported an increase in knowledge and confidence in caring for this patient population. They stated they would recommend the presentation to their colleagues and that it increased their confidence to deliver anesthesia to autistic patients. The indirect effect of this project will benefit autistic patients and families at this facility, thus satisfying the project's original goal.

Choosing to deliver an educational presentation about ASD to a large group of anesthesia providers provided meaningful information to the frontlines of anesthesia. Sharing information about various behaviors and needs of autistic individuals, nonpharmacologic accommodations, and more sophisticated pharmacologic interventions for pre-anesthesia medications indirectly improved the care of autistic patients at the project site.

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Appendix A

Table of perioperative accommodations for autistic patients:

Non-pharmacologic	Pharmacologic Premedication
Utilization of a Child Life Specialist in the preparation for and during anesthesia induction	Consider patient preference and prior experiences for route and drug selection
Thorough preoperative interview with patient and caregivers, including triggers, sensory difficulties, special interests, signs of stress	If safe, have the patient take any sedating medications in their usual timing preoperatively (BZDs, guanfacine, clonidine, antipsychotics, antiepileptics)
Priority scheduling – the first case of the day	Midazolam PO, IV, IM, IN
Elimination of waiting in a large, noisy waiting room, straight to the preop area, shorter wait times	Ketamine PO, IV, IM, IN (consider adding midazolam or dexmedetomidine to smooth side effects)
Knowledgeable providers who are familiar with the patient, continuity of care	Dexmedetomidine IV, IM, IN
Identification of “special needs” on the surgery schedule to alert staff to provide additional time or preparation for the patient	Very Cooperative: Preoperative PIV placement + Midazolam IV
Caregiver presence as much as possible, including during induction if appropriate and safe	Fairly cooperative: Midazolam PO
An environment that is quiet, dimly lit, calm in demeanor, respectful of patient’s bodily autonomy, the additional time is given after requests are made, non-facing interactions (don’t face patient head on, don’t insist on eye contact or look at their face)	Tenuously cooperative: Midazolam + Ketamine PO
Involve patients and caregivers in decision-making, utilize past responses as a prediction of future responses	Uncooperative/combative: IN Midazolam or Dexmedetomidine
Integrate routines from daily life into perioperative experience as able	Completely uncooperative: IM Midazolam + Ketamine Or IM Midazolam + Dexmedetomidine Or IM Ketamine followed by IV Midazolam once PIV established
Preoperative teaching and rehearsal – can start at home or in established ongoing therapy if present	
Allow the patient to remain in their own clothes and use personal blankets, toys/stuffed animals, screens, etc.	

Appendix B**Website References:**

Master Anesthesia outlines the basics of caring for autistic patients.

<https://masteranesthesia.com/autism-spectrum-disorder/>

Mr. Stephen Edwards has a useful and compassionate guide for providers and families.

<https://stevenedwards.com.au/surgery-considerations-for-patients-with-autism-spectrum-disorder/>

The site for Dayton Children's composed a comprehensive and kind guide for families.

https://www.childrensdayton.org/sites/default/files/PediatricForumSpring2022_EP11606_FIN_AL.pdf

Appendix C

- A. The survey had 35 respondents, who gave overwhelmingly positive feedback. The author was approached by multiple providers (about 20) following the presentation with voluntary positive feedback.
1. Question 1: Prior to attending this presentation, my confidence level in caring for autistic patients was
 - a. Very Confident (2, 6%)
 - b. Confident (5, 14%)
 - c. Less confident than I would prefer (22, 63%)
 - d. Not confident at all (6, 17%)
 - e. Not applicable (0, 0%)
 2. Question 2: How likely is it that you would recommend this presentation to a colleague or other applicable healthcare worker?
 - a. Very likely (30, 86%)
 - b. Likely (5, 14%)
 - c. Neutral (0, 0%)
 - d. Not very likely at all (0, 0%)
 - e. Not at all likely (0, 0%)
 3. Question 3: Overall, how would you rate this presentation?
 - a. Excellent (33, 94%)
 - b. Very good (2, 6%)
 - c. Good (0, 0%)
 - d. Fair (0, 0%)
 - e. Poor (0, 0%)
 4. Question 4: Following this presentation, my confidence level in caring for autistic patients is
 - a. Very confident (10, 29%)
 - b. Confident (25, 71%)
 - c. Less confident than I would prefer (0, 0%)
 - d. Not confident at all (0, 0%)
 - e. Not applicable (0, 0%)
 5. Question 5: How likely are you to use the information presented today in your practice?
 - a. Very likely (29, 83%)
 - b. Likely (6, 17%)
 - c. Neutral (0, 0%)
 - d. Not very likely at all (0, 0%)
 - e. Not at all likely (0, 0%)
 6. Are there any comments you would like to share?
 - a. “This was a very informative presentation! The day after, I had a patient with Down syndrome and I applied some of the same techniques. I asked the patients mother about triggers and things that would help the patient stay calm while going to sleep and waking up. It turns out the patient LOVES listening to Usher, so we jammed to Usher during these times and the patient loved it!!”
 - b. “Excellent presentation!”

- c. “Excellent presentation”
- d. “Great information!”
- e. “Thank you!”
- f. “Great job! Thank you for sharing such valuable information.”
- g. “Very thorough review of periop management of ASD patients. Well done”
- h. “A wonderful presentation on a pressing topic!”
- i. “Great presentation!! Great content!!”
- j. “Awesome topic!”
- k. “Very informative presentation!”

B. Graphic representation of the answers to questions one and four in comparison, which demonstrates the confidence in caring for autistic patients before and after the presentation:

