



Autism Spectrum Disorder Treatment Interventions in Response to the COVID-19 Pandemic: Perspectives through an online parent survey

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Abstract

Parents of clients with Autism Spectrum Disorder (ASD) and clinicians have been forced to adapt to special circumstances in response to the global COVID-19 pandemic. Due to restrictions brought by the pandemic there was a significant increase in frequency and severity of symptoms of ASD and a subsequent increase in levels of stress for parents. Many treatment modalities changed to incorporate remote treatment or adjusted their services to accommodate restrictions due to COVID-19 lockdowns. Parents of children with ASD diagnosis have experienced the changes by the pandemic and monitored the treatment firsthand in the absence of consistent treatment. The current study assesses and analyzes adjusted treatment modalities and their efficacy through administration of an online parent survey. The survey gathers relevant information into understanding the status of treatment during the pandemic and the parental perceptions of helpfulness across various types of treatment options. Results from the online survey found support for in person treatments, population and symptom categories best served through telehealth treatment, and additional resources for understanding approaches for treatment in the pandemic. Findings can be used to benefit parents, clinicians, and especially clients and should be used to decrease the aversive effects of ASD and symptoms of ASD exacerbated by the COVID-19 pandemic and future disruptions in face-to-face treatments.

Keywords: Autism Spectrum Disorder, COVID-19 Pandemic, telehealth/online treatment

Introduction

Direct experience observing the changes of treatment due to the COVID-19 pandemic and their effects on clients/families with Autism Spectrum Disorder led me to investigate the perceptions of treatment from client families. Within this population, the smallest disruption in schedule could result in significant distress for families and children. The distress and accompanying behavioral reactions often lead to deviation from treatment goals. Oftentimes treatment goals take long periods of time to gain progress and lapses in treatment can cause lost progress or taking a step back from goals. Constant contact has been needed to ensure the best benefit of therapy and outcomes with clients. At the height of the COVID-19 pandemic there were periods where service providers were not able to see their clients at the same schedule or by the

same means as done for years prior. Disruptions in services can be frequent due to schedule changes, job turnover, and other unanticipated changes. However, during the COVID-19 pandemic the disruption in services required almost immediate adaptation from in person to telehealth or remote treatment in a matter of days. From my experience, my clients and their families saw a huge burden increase at the absence of frequent in person treatment services and I assume this was observed across the field.

The current study is aimed to assess and analyze parent perceptions regarding their child's treatment for symptoms of Autism Spectrum Disorder in response to changes brought by the COVID-19 pandemic. The pandemic has caused a significant increase in symptoms of ASD and stress among parents [7]. Remote treatment modalities have certain risks and benefits that

may help or adversely affect clients with ASD. The current study is aimed at providing clarity into efficacious certain treatment modalities in response to the COVID-19 pandemic from the parent's perspective. Parents may have provided the only structure and stability present for ASD individuals in the chaotic period of the COVID-19 pandemic. With this information clinicians, parents, and children with ASD can benefit from using this information and will hopefully provide more positive outcomes.

Review of Literature

A broad review of the literature was done in an attempt to get a generalized understanding of treatment changes in response to the pandemic. When first researching the literature there was a reasonable dearth in literature available within this area since the COVID-19 pandemic had only just started. Research that was available from March 2020-July 2020 was mostly assessing remote/telehealth interventions in comparison to in-person treatment research. The literature also included in-person treatment studies. Since there was no immediate demand for exclusively remote/telehealth forms of treatment until March-April of 2020 this literature was limited and unavailable. As the study and review of literature began to develop and progress the research was similarly growing due to time passing and researchers sharing their findings. This was especially evident in later months, July 2020 – November 2021 when researchers were completing and submitting articles. These later articles provided added insight into remote/telehealth treatments efficacy and empirically validated strategies.

Effects of the COVID-19 Pandemic on ASD Populations

The COVID-19 pandemic and its effects have had significant effects on nearly all aspects of human life. Certain states within the United States have also implemented differences in procedures in responding to the COVID-19 pandemic. Some states responded with highly restrictive lockdowns while others responded to lesser degrees. Despite these necessary measures to avoid spreading the life-threatening virus, protective procedures have caused significant disruptions in daily life, more specifically resulting in perceived psychological problems [22]. In their study, researchers also highlighted the importance of social connection to mitigate psychological problems which is one of the main areas of dysfunction noted with individuals with Autism Spectrum Disorder (ASD).

Individuals with Autism Spectrum Disorder who struggle with social communication, inflexibility, and insistence on sameness had significant difficulty adapting to this new norm and chaotic period of the pandemic [7,10]. Many treatment providers and researchers have been forced to adapt their interventions to accommodate the changes set forth by the pandemic response measures [20]. Clients receiving services in clinics, homes, and at schools were forced to isolate themselves, alter services and/or almost completely halt, or stop these services for the lengthy duration of the

lockdowns. Current research studies have found responses and strategies meant to remedy difficulties precipitated by the COVID-19 pandemic have been far from optimal and in need of significant improvement [12,21].

The COVID-19 Pandemic limited certain providers in their abilities to provide constant daily contact with their clients causing variances in routine and lapses in treatment [7]. These variances are directly related to symptoms and difficulties within ASD diagnosis. In their study researchers [7] found the COVID-19 pandemic negatively affected individuals with Autism Spectrum Disorder. More specifically they found challenges to hit over 93% of families. These challenges included difficulties managing daily activities, free time, and structured activities. Problem behaviors showed a significant increase with both frequency and intensity of behavior [7]. Researchers saw needs emerge in healthcare support, in-home support, and specialized needs meant to address the problems brought about by the quarantine/lockdown itself. With increased symptom severity and increased needs for support the COVID-19 pandemic was equally if not more of a crisis for ASD individuals than the rest of the world. [7] similarly found COVID-19 restrictions to be extremely difficult and required substantially higher commitment to fulfill their child's needs. They endorsed discontinuation of services due to the pandemic and the unique challenges brought about by restrictions were significant and different from previous disruptions in services due to the severe nature of the restrictions as well as the duration of the restrictions.

Education systems have also been negatively affected by similar challenges due to the COVID-19 pandemic. Many schools have been forced to adjust to remote learning or learning via technological means to incorporate mandates of social distancing. School teachers and special education instructors have been forced to adapt 'on the fly' to meet the needs of their students [8]. Oftentimes adapting 'on the fly' means making changes to best teach subject material to different students who have different needs. They noted each range of functioning comes with its own challenges. Higher functioning individuals with ASD might respond differently to the changes brought by the pandemic to those who are lower functioning. Lower functioning individuals were noted to need additional support and strictly remote interventions have not been found to be effective when solely used.

Autism research has also been significantly affected through the pandemic [1]. Many clinical research experiments were forced to adapt or restart their research processes altogether. A large portion of this was in response to limiting immediate face to face contact with clients (participants) and their families. Therefore, a number of promising intervention strategies have halted and may not be available for widespread clinical implementation for significantly longer than anticipated. The research community also suffered a loss. Many research teams diminished in size, and job opportunities in research have seen a decrease that will indirectly have a negative effect on

intervention development.

Adjusting Treatment Modalities

Despite the mountains of challenges brought by the pandemic, treatment providers and researchers have done their best to continue their work whilst adapting to the changing circumstances. Few studies have been conducted assessing and identifying strengths of these adjustments. Adjustments to treatment modalities have included changes in frequency of contact, means of contact (technologically or remotely via homework), and also included in-depth parent training programs. In the previously mentioned study, researchers also highlighted a number of considerations for conducting telehealth research that could also be applied to telehealth interventions [1]. They found effective rapport building, limiting of language barriers, dissemination or appropriate information, adequate support to avoid stigma, multiple methods of connecting using technology, and flexibility with scheduling to be of special significance and aid. [1] also noted some adults with ASD positively responded to altering methods of treatment to remote means. They found, as demonstrated by a large number of studies, that telehealth can be as effective as any other means of treatment [19].

Individuals with high functioning ASD have struggled in the past with in-person schooling due to difficulties with social rules and societal norms, or the 'hidden curriculum' as described by researcher [18]. Difficulties with the 'hidden curriculum' have resulted in anxiety and other related problems. Remote learning modalities have shown increases in academic performance and decreased symptoms of anxiety in individuals with ASD. However, one criticism of [18]'s study points out the need for social engagement to further social skills, which is not as available when using remote learning modalities. However, remote learning for higher functioning individuals with ASD has been found to be a promising treatment option despite these criticisms.

Russian researchers Pancy and Shvedovskiy (2020) found a number of potential benefits for remote administration of ASD counseling. One important aspect of note regarded the ability for a clinician to see the client in their home environment. In their home environment clinicians can see where the client is most comfortable and feel the most safe, which is important for a client with ASD. A clinician seeing into the client's home can see how they behave in their natural environment and multiple forms of family interaction. However, providing full-time support and immersive strategies often used in certain intervention models is difficult with exclusively remote treatment modalities. Without direct contact with clients, treatment teams must rely on parents, effective parent training, and specialized interventions adapted to the new context. Researchers concluded emphasizing lack of direct contact between therapists and clients impedes abilities to provide necessary materials which can cause disruption in treatment. Another finding noted that clients with ASD may

struggle with being non-verbal, misreading facial expressions, technical difficulties and more that impede their ability to participate in treatment.

Researchers [3] conducted a study assessing parent and service provider perceptions regarding early intervention parent training administered online. They found all groups including parents, service providers, and ASD specialists perceived remote technologies to be helpful with reducing cost, time, and travel, flexibility, and connected all members of a treatment team together. However, one major negative review found technical difficulties were too frequent and that remote strategies should be supplemented to face to face contact and not replace it. These findings along with other findings support the use of remote/telehealth treatment as an additional tool to in person treatment modalities.

Parental Involvement in Treatment

With additional treatment modalities being developed and implemented there have been a number of studies done in attempts to empirically validate them. One study assessed the efficacy of a remote speech-language intervention with parent participation [4]. Results highlighted the importance of parental involvement in intervention programs. They found that treatment providers should support parents to take active roles in facilitating learning environments for children with ASD and to implement treatment strategies independently. Findings reinforce the need for parental buy-in and involvement as well as parental implementation of treatment for best outcomes for individuals with ASD.

Another article published by [15] entitled, "Handle the Autism Spectrum Condition during Coronavirus (COVID-19) Stay at Home Period," included ten tips for parents and caregivers. This list of strategies emphasized parent involvement in treatment and care as well as necessary parent training aspects. The ten tips included: 1) Explain to Your Child What COVID-19 Is, 2) Structure Daily Life Activities, 3) Handle Semi-Structured Play Activities, 4) Use of Serious Games, 5) Shared Video Game and/or Internet Sessions with Parents, 6) Implement and Share Special Interests with Parents, 7) Online Therapy for High-Functioning Children, 8) Weekly Online Consultations for Parents and Caregivers, 9) Maintain Contact with the School, and 10) Leave Spare Time. [15] similarly supported the need for parent involvement in treatment.

Another study conducted by researchers described the intervention plan used by treatment providers in Italy, a country significantly affected by the COVID-19 pandemic [9]. They implemented an intensive treatment model almost exclusively carried out by parents. The intervention included assessment for child's risk factors and verbal functioning, a parent coaching system, high structure for each day's activities, and setting up a positive reinforcement system enforced by parents. Each activity and reinforcement system were specifically catered to the parent and child's needs. The study concluded with a number of parent notes instead of statistical

analysis due to not having been able to analyze data as of yet. Overall summaries of the results covered the need for high parental involvement, training, and structure.

Effects of Parent Perceptions

Parents of children with ASD are often the real front line workers in treating and managing symptoms of ASD. Often-times parents are crucial for positive intervention outcomes and frequently have the best perspectives regarding their child's overall well-being. They also have control regarding treatment option choice and adherence. [11] have previously established and researched the positive outcomes of involving clients more directly in the course of their therapy. When clients are given more 'directorial control' in the processes of their therapy, change has been theorized to work efficiently. Parents of clients similarly should have input and a degree of control regarding treatment of their children. As previously mentioned, parental involvement and buy-in are highly correlated with treatment adherence and positive outcomes [15].

Parent perspectives are also extremely valuable during the pandemic due to limited ability for clinicians to spend a large amount of time with their clients. One research study conducted in Michigan administered a survey assessing parent's perceptions of ASD children of their responses to changes brought by the COVID-19 pandemic [14]. They found significant results in reports for high levels of stress, disruption in life, and a greater need for respite care. [14] findings suggested the younger and more severe the symptoms the higher the degree of stress. They found an increase in demand for respite services even with the health risks brought on by the pandemic. Per the ASD diagnosis being a spectrum, the higher the severity of symptoms the higher the needs of the children. Adaptability and ability to manage changes in routine have dictated many clinicians' responses to COVID-19 demands. Incorporating parent perspectives has increased clinicians understanding of client difficulties and aids with making clinical decisions.

[17] conducted a similar study looking into parent perceptions of ASD treatments while using an internet medium for survey administration. In her study researcher [17] emphasized the importance of parental perceptions of progress in participation in therapy programs. [17] found parents who are less satisfied with conventional treatment strategies regarding overall satisfaction and perceptions of progress are more likely to search for complementary health approaches and discontinue services they perceive as less helpful. Emphasis on both factors of satisfaction and perceptions of progress gave insight into parental decisions regarding their children's treatment. Parent's perceptions are often the strongest driving factor for a child with ASD to continue in treatment or discontinue.

Parent Survey Research

One group of researchers through healthcare provider Kaiser Permanente formulated a survey analyzing parents of children with ASD's experiences with service and treatments [5]. Main

goals of their survey looked at response rates of the survey and found rates to be low potentially due to the lengthiness of the survey. In their study they also assessed specific domains of; transition to adulthood, behavioral treatments, causes of autism, genetic studies, stress reduction/coping strategies (parent/caregiver), environmental risk factors, complementary and alternative medicine treatments, medication treatments, and disinterest in participating in any research studies. Parents were found to be most to least willing to participate in the domains in the previously mentioned order. They also noted parents preferred email and internet means of participating in research over in-person means of research.

[14] similarly formulated a survey for parents of children with ASD. In their study they found mixed results regarding participation in the online survey. They found immediate threats to the generalizability of their findings were in non-response bias. They found non-response to be high among the populations to whom they sent the survey. Major factors affecting non-response bias noted in the study included single households, older children and younger mothers. Other significant weaker variables included increasing urbanicity, non-white families, rearing more than one child with an ASD, and lower maternal education. Non-response due to these factors have limited the generalizability of internet mediated research within the target population. Despite the concerns and limitations regarding the use of parent survey research, parent perspectives are often the best predictors for adherence/continuation of treatment and are highly correlated with improvement toward functional/adaptive goals [6]. In another study researchers [13] conducted a survey seeking predictors for parental satisfaction regarding remote or telehealth treatments. They found parents were least satisfied with telehealth mediums for treatment of ABA/Behavioral, speech/language, and occupational therapy services. Modes observed for these treatment mediums included continuation of in person goals adjusted to fit via telehealth.

After a year of significant changes due to the COVID-19 pandemic a number of treatment providers have been forced to make adjustments to their treatment modalities. Those adjustments have more often than not involved increased participation and collaboration with the parents of these clients. With parents being the real front-line workers, the aim of the current study is to evaluate and analyze the parent perceptions of efficacy of the measures taken to treat symptoms of ASD during the COVID-19 pandemic. Parents often have the best insight into their children's symptoms, overall well-being, and the progress of treatment from a general perspective. This is in part due to being with the clients much more than treatment providers in most cases. Survey development will include factors to increase the generalizability and relevancy of the study findings.

Rationale for Study

Many treatment providers have been forced to limit their im-

mediate in person exposure with their clients, to which clients have suffered significantly. There has been a measured increase in severity and frequency of symptoms of ASD as well as a measured increase in stress for parents of children with ASD [7]. Due to a widespread need for social distancing changes in treatment modalities have been forced to occur. Due to the complex nature of the autism diagnosis, many individuals diagnosed with ASD need face to face contact for therapy and may not benefit from remote interventions as much as other diagnoses. Remote treatment modalities have certain risks and benefits that may help or adversely affect clients with ASD. In order to understand the perceptions of these remote treatment modalities, a remotely administered parent survey can gather important information adding insight to areas of strength and weakness in current interventions being implemented. The current study hopes to provide clarity into adjustments made by treatment providers in response to the COVID-19 pandemic that have been perceived as helpful and promising, while also determining which methods have been perceived as unhelpful. These findings will hopefully have applications for treatment and clinical implications.

Purpose of the Study

The current study is aimed to assess and analyze parent perceptions regarding their child's treatment for symptoms of Autism Spectrum Disorder in response to changes brought by the COVID-19 pandemic. This information will give insight into how parents experience services and what they see benefitting to their children. As demonstrated by [15] and [16], parent perceptions of treatment are often highly correlated with positive treatment outcomes and adherence to treatment. Parent surveys are a quick, easy, and effective way of understanding ASD treatments and can provide good insight into future outcomes of treatment. In this survey, questions inquired to understand the effects of changes or lapses in services and which treatment strategies have been perceived efficacious by parents. The survey inquired about changes in severity of symptoms due to the COVID-19 pandemic, treatment adjustments taken to remedy those changes, and perceived helpfulness measures of telehealth/remote treatment. These adaptations to treatment have included in-person, remote/telehealth, and parent training approaches. The study of parental perceptions of efficacy of treatments is necessary in order to develop better telehealth intervention strategies for future treatment of individuals with Autism Spectrum Disorder.

Research Questions/Hypotheses

In completing the review of literature and observing and identifying some gaps in the literature it is evident there are a number of questions that could be answered in the present study. Firstly, do parents perceive either remote/telehealth treatments or in person treatments to be better suited for treatment of ASD symptoms? This question can be answered

through looking at perceived helpfulness of treatment by severity and again by age. It is hypothesized that parents will not endorse any significant differences between treatment types remote/telehealth and in person. Another question hoped to be answered by the research involves treatment of symptoms during the pandemic. Secondly, which symptoms of ASD were perceived to be best and least treated through remote services? This question will be best answered by comparing each symptom category by age then again by diagnostic severity. It is hypothesized that there will be no significant differences in perceived treatment efficacy of symptoms by age or severity.

Another question hoped to be answered by the research would collect descriptive data regarding which aspects of treatment were perceived to be helpful. Thirdly, which aspects of remote/telehealth treatment were perceived to be helpful? It is hypothesized remote interventions do not aid any symptoms of ASD. One last research question that can potentially be answered by the current study involves perceived efficacy of parent training programs. Lastly, were parent training programs perceived to be helpful in treating symptoms? If so, which parent training programs were helpful? Data compares parent training perceived helpfulness endorsements by age and again by diagnostic severity specification. Descriptive data was similarly collected to identify which parent training sessions were perceived helpful. Lastly, it is hypothesized parent training will not be perceived as helpful across all ages.

Significance of the Study

These results could be of special significance to the current time period of increased uses of telehealth due to both technological advances and uncertainty regarding a turbulent health crisis. The implications of this study might also extend to future uses. Current and future uses for this study could include aiding individuals with autism spectrum diagnosis, families of individuals with autism spectrum diagnosis, treatment providers, and researchers. Perhaps first and foremost individuals with ASD may benefit from more effective intervention strategies that have incorporated findings of this research into practice. The uses of best practices in treatment will hopefully decrease severity of symptoms of ASD and increase quality of life. Families of individuals with ASD may also benefit from this study from choosing validated and empirically based treatment options that can decrease stress levels brought about by the COVID-19 pandemic.

Treatment providers are also a major stakeholder or beneficiary of this research. Providers can incorporate areas of this research that could be found especially helpful to clients into their own practice. They can also decrease uses of other practices that may be found ineffective or even harmful. Researchers are also potential stakeholders or beneficiaries of this research. The literature currently available gives insight into parent satisfaction of treatment during the pandemic. One

area lacking insight in the literature included parent perceptions of parent training programs and other adjustments made specifically for the pandemic. This research could give insight into which interventions are perceived to be more helpful than others. Researchers could also use this information to inform future treatment strategy development. Potential benefits of this research can aid parents/families, treatment providers, researchers and most importantly individuals with ASD. These results will hopefully aid with researching and implementing effective treatment strategies that can combat the current difficulties exacerbated by the COVID-19 pandemic and any future demands that may cause lapses or disruptions in face-to-face treatment. More specifically it is intended to aid telehealth and remote treatment modalities but can also be of aid to in person modalities. Should treatment providers be forced to adapt to remote/telehealth means hopefully these findings can facilitate a seamless transition rather than what occurred over the pandemic.

A quantitative study collecting data measuring the perceptions of parents regarding their children's treatment during the pandemic could contribute to the lack of research in the existing literature. Through use of a brief survey with a number of analyses hopefully the current study can aid with understanding areas of strength and weakness in current approaches in treatment.

Methods

Sample and Selection Criteria

Individuals who participated in the survey were parents of individuals diagnosed with Autism Spectrum Disorder and had to manage demands brought about by the COVID-19 pandemic. All parents of children with ASD diagnosis who had the survey reach them were able to complete the survey if they so desired. Methods used for sampling included primarily convenience sampling. The survey was posted online through a large number of autism websites and social media pages until research write ups were required by the researcher's academic program. Websites and web pages used in this study included; Facebook/Instagram, Autism Speaks, and through a number of service providers. Since the survey was anonymous there is no record indicating which sources filled out the survey the most and least. While 200 – 300 responses were anticipated, due to a number of limitations, the total number of participants at the conclusion of the recruitment time period was eighty. These limitations are identified and discussed later.

Instruments

The survey was created for the purposes of this study and has not been standardized or normed. This is due to the special circumstances brought about from the pandemic. Items identified and used in the survey were identified in the review of literature to be helpful in treatment. The first section of the survey includes the informed consent portion.

Following items include relevant information regarding the target population. This includes previous diagnosis severity, age, access to and modality of services, and history regarding services in the past couple years. The next section collects the important data assessing efficacy of telehealth services or adjusted services in response to the COVID-19 pandemic. These include the main groups and subgroups used in statistical analysis. Main groups include status of treatment in the pandemic and response to alteration in services as well as noted elements noted to be supporting efficacious telehealth treatment as explained in the review of literature [1,4]. The following section collects information relevant to parent training procedures implemented in response to the pandemic. Upon conclusion of this survey the participants are thanked for their participation and inclusion of their experience as reflected by their answers.

Procedures

The sampling method used in this survey was a convenience sample. The survey was sent out to ASD parenting groups, websites and through a number of clinics, specifically assessing and treating individuals diagnosed with ASD. Preliminary searches for available websites with access to parents included many open-source pages and even more pages that require requests. The survey distribution was planned to occur for a total of 5 months, from August 2021-January 2022; the surveys were instead administered from mid November 2021- end of March 2022. The survey was sent out to as many parent groups for ASD as was available. This included but was not limited to Facebook pages, Blogs, Treatment Organizations, and others. Parents were able to take the survey at their own volition. Firstly, the parents filled out the informed consent as the first page to the survey. Informed consent addressed items of confidentiality, risks and benefits of the research, their ability to discontinue at any point, and included any additional resources available to them. Following the informed consent, they filled out relevant target population information. Following the demographic information, they then filled out the survey items. The survey items covered symptoms noted over the pandemic, treatment strategies used, treatment modalities used, as well as their perceptions on symptom severity and treatment helpfulness. All data was collected with intentions for use in statistical analysis.

The data collected was analyzed using several statistical methods. Minimum requirement for statistical significance will be $p < .05$. The first comparison used a one-way Analysis of Variance (one-way ANOVA) comparing the treatment modality perceived helpfulness by ages of clients with ASD and then again by severity of diagnosis. Groups were separated by age (3 total age groups) and diagnostic severity (3 total diagnostic severity groups) being tested against treatment type helpfulness groups (2 total responses). Any significant differences identified were analysis in Post Hoc analysis using a Tukey Test. One-way ANOVA was used to compare telehealth

treatment perceived helpfulness scores across symptom interventions (behavioral challenges, social skills, school demands, and adaptive/hygiene skills) by age and again by diagnostic severity. Groups were separated by age (3 total groups) and again diagnostic severity (3 total groups) being tested against specific symptom categories (4 total groups). The last one-way ANOVA compared groups of age and again diagnostic severity against perceived parent training helpfulness. Groups were separated by age (3 total groups) and/or diagnostic severity (3 total groups) being tested against perceived parent training helpfulness (2 total groups; Yes or No).

Descriptive statistics also generated information into frequency data for aspects of remote/telehealth treatment perceived to be most helpful. The total topics included is 6 with a write-in option. Frequency data was also collected regarding parent training programs. This data identified parent training programs provided over the course of the pandemic perceived to be helpful. Frequency data was also collected regarding treatment options available before and during the pandemic. Descriptive statistics were used in identifying supplemental information to provide clarity to ANOVA findings.

Ethical considerations

This study contains a number of ethical considerations to be discussed. [2] there are several steps and considerations needed before processes of data collection and analysis. Principle 8.01, Institutional Approval is crucial prior to proceeding with data collection procedures. Institutional approval ensures the research will not incur more risk than potential benefit as well as whether the study should be conducted.

Principle 8.02 Informed Consent is similarly relevant to the uses of this study [2]. This study includes the informed consent portion upon beginning the online survey. This informed consent informs participants to; the purpose of the research, expected duration and procedures, their right to decline and withdraw at any point, the consequences of declining or withdrawing (none), any potential risks, discomfort, or adverse effects, any research benefits, limits of confidentiality, incentives for participation (none), and whom to contact for questions about the research and participants' rights. Participants were similarly informed of the nature of the research being investigative and attempting to gather perspectives. No deception was used in the study and therefore no needed verification or debriefing.

Ethical principles 4.01 Maintaining Confidentiality is also relevant to the study due to the sharing of information through use of an online survey [2]. Confidentiality was similarly discussed in the informed consent portion. Participants are informed that none of the data being collected contains Protected Health Information and therefore need not worry about potential breaches in confidentiality. Parents were asked to share the age of their children diagnosed with ASD and other information relevant to their child's treatment. No identifiable information was collected. Confidentiality is

completely maintained through use of an online survey rather than an in-person data collection method as well.

This study attempts to maximize potential benefits to the research and minimize risks per principle A, Beneficence and Nonmaleficence [2]. As outlined in the principle this study and researcher attempts to; protect the welfare and rights of participants and other affected persons, resolve conflicts and minimize harm, avoid the misuse of influence, and strive to be aware of one's own physical/mental health on the ability to help. This study contains a number of benefits and hopefully few to no risks. Benefits for this study include but are not limited to applications to individuals diagnosed with ASD and their families, treatment providers and researchers. Individuals and families may benefit from this research first from future implementation of learned best practices identified in the study. Families may also gain information into current treatment options and previously successful strategies to revisit. Treatment providers also may benefit from added insight from parent perspectives of success within treatment. They may learn beneficial information for their current and future practices with their clients and families. Lastly, researchers may also benefit from uses of the findings of this study for future treatment development as well as use of similar methods for future research.

Due to the study being an anonymous survey there are few to no risks within the study, The only potential risks identified involve confidentiality and recalling previously experienced stressful events. Information collected regarding identifiable information will not include names, addresses or any other protected health information. Participants were not required to divulge any personal information and were anonymous. Whilst data was being collected, it was secured safely requiring multiple passwords to be accessed. The only other risk anticipated to be involved with the study includes participants recalling distressful or potentially traumatic events brought about by challenges from the COVID-19 pandemic and their child's symptoms. These recalled events do not go into significant detail and inquiry into these events is not framed in such a way that may be triggering to participants. However, to mitigate any adverse reactions to questions the informed consent includes an invitation to discontinue at any point the survey becomes overwhelming and provides additional support information upon request. Fortunately, in implementation this risk did not materialize, and researchers were not contacted for additional support.

Limitations of the Current Design

Some limitations of the current design include the sampling method, the specificity of the interventions addressed, and gathering information for some that has already passed. The sample used for the study was predominantly English readers who were willing and able to complete the survey. Those who did not read English, have access to technological means, and are not willing or able to participate were excluded. Their

information could be especially helpful in expanding the external validity and generalizability of the study. The survey was also only sent out to sources available to the researcher either by professional connections or groups available to the overall population. This limits the generalizability due to limited participants the survey could reach.

The interventions addressed in the study are somewhat broad and attempt to include a large number of telehealth intervention strategies. Due to the need to keep the survey at an appropriate length it was necessary to address intervention strategies generally instead of specifically. In doing so more specific interventions that are especially beneficial and helpful may be missed and not given validation. However, it is anticipated that the results can provide structure and insight into any number of interventions, especially telehealth related but also remote. The goal of the findings is to provide overarching principles that can aid any intervention instead of validating specific interventions.

Results Recruitment

Upon conclusion of the approval processes of the Institutional Review Board (IRB), data collection was initiated. Preliminary data collection procedures included posting the link and information of the study to social media pages dedicated to the population of parents to individuals on the Autism Spectrum. Later measures included reaching out to organizations that provide information, services, and other resources to the Autism community. Data was collected between November 17th, 2021, and March 29th, 2022. Total participant responses ranged from item to item, but total surveys completed were eighty. Two responses included parents of individuals not diagnosed and were excluded from analysis. Multiple items were optional for parents to fill out depending on the types of services received.

Statistics and Data Analysis

The first area of inquiry and research question's investigations yielded informative results regarding parent perceptions of efficacy between in person and online treatment analyzed by age and diagnostic severity. The previously established statistical analysis method for all data included analysis of variance and other descriptive statistics. Tables and Figures will include multiple graphics aimed at providing clarity to result interpretations (Tables 1 and 2)(Figure 1).

Despite no significant differences noted between age $F(2,77) = 1.094, p = .34$ and diagnostic severity groups $F(2,77) = 1.288, p = .282$ there was a noted perceived efficacy using in person treatment types over online video therapy types. As demonstrated by the table below 85% preferred in person treatments over 15% of parents who endorsed online treatments.

In the second area of inquiry, parents' perception data was collected regarding perceived helpfulness of telehealth/online

Table 1. ANOVA Parent Perceptions of Helpfulness In-Person or Online by Age.

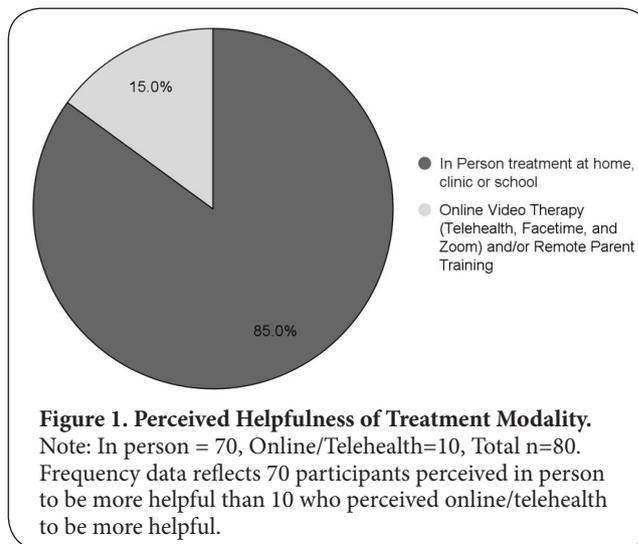
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.282	2	0.141	1.094	0.340
Within Groups	9.918	77	0.129	--	--
Total	10.200	79	--	--	--

Note: One way ANOVA analysis demonstrated conditions of perceived efficacy of in person treatment or online treatment by age were not statistically significant at a p level of <0.05.

Table 2. ANOVA Parent Perceptions of Helpfulness In-Person or Online by Diagnostic Category.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.330	2	0.165	1.288	0.282
Within Groups	9.870	77	0.128	--	--
Total	10.200	79	--	--	--

Note: One Way ANOVA analysis demonstrated conditions of perceived efficacy of in person treatment or online treatment by diagnostic severity were not statistically significant at a p level of <0.05.



therapy of symptom category and was analyzed by age and again by diagnostic severity category. Symptom categories included behavioral treatment, social skills treatment, school related demands treatment, and adaptive skills treatment. The statistical analysis method previously established included a one-way analysis of variance (one-way ANOVA) with Post Hoc testing of a Tukey HSD test for significant results that are identified (Tables 3 and 4).

Results of Post Hoc analysis identified significant differences between age groups 2-10 and 11-18 under the condition of telehealth treatment of social skills $F(2,67) = 4.127, p = 0.02$ (Table 5).

Table 3. ANOVA Parent Perceptions of Telehealth Treatment Helpfulness of Symptom Category by Age.

Predictor		Sum of Squares	df	Mean Square	F	Sig.
Telehealth Treatment of Behavior	Between Groups	13.889	2	6.945	2.437	.095
	Within Groups	188.111	66	2.850		
	Total	202.000	68			
Telehealth Treatment of Social Skills	Between Groups	22.286	2	11.143	4.127	.020
	Within Groups	180.914	67	2.700		
	Total	203.200	69			
Telehealth Treatment of School Demands	Between Groups	9.900	2	4.950	2.509	.091
	Within Groups	108.531	55	1.973		
	Total	118.431	57			
Telehealth Treatment of Adaptive	Between Groups	3.733	2	1.867	1.026	.365
	Within Groups	98.197	54	1.818		
	Total	101.930	56			

Note: One way ANOVA analysis demonstrated conditions of perceived efficacy of online treatment by symptom category by age were statistically significant at a p level of < .05. Specifically significant results identified in telehealth treatment of Social Skills.

Table 4. Post Hoc ANOVA Parent Perceptions of Telehealth Treatment Helpfulness of Symptom Category by Age.

Dependent Variable	(I) Age	(J) Age	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Telehealth Treatment of Behavior	2-10	11-18	-.930	.440	.095	-1.98	.12
		Above 18	-.020	.633	.999	-1.54	1.50
	11-18	2-10	.930	.440	.095	-.12	1.98
		Above 18	.910	.653	.350	-.66	2.48
	Above 18	2-10	.020	.633	.999	-1.50	1.54
		11-18	-.910	.653	.350	-2.48	.66
Telehealth Treatment of Social Skills	2-10	11-18	-1.217*	.424	.015	-2.23	-.20
		Above 18	-.513	.616	.684	-1.99	.96
	11-18	2-10	1.217*	.424	.015	.20	2.23
		Above 18	.704	.632	.510	-.81	2.22
	Above 18	2-10	.513	.616	.684	-.96	1.99
		11-18	-.704	.632	.510	-2.22	.81
Telehealth Treatment of School Demands	2-10	11-18	-.858	.399	.089	-1.82	.10
		Above 18	-.065	.565	.993	-1.43	1.30
	11-18	2-10	.858	.399	.089	-.10	1.82
		Above 18	.793	.577	.360	-.60	2.18
	Above 18	2-10	.065	.565	.993	-1.30	1.43
		11-18	-.793	.577	.360	-2.18	.60
Telehealth Treatment of Adaptive	2-10	11-18	-.020	.398	.999	-.98	.94
		Above 18	.693	.515	.375	-.55	1.93
	11-18	2-10	.020	.398	.999	-.94	.98
		Above 18	.713	.546	.397	-.60	2.03
	Above 18	2-10	-.693	.515	.375	-1.93	.55
		11-18	-.713	.546	.397	-2.03	.60

Note: Post Hoc One-Way ANOVA analysis utilizing a Tukey HSD test demonstrated conditions of perceived efficacy of online treatment by symptom category by age were statistically significant at a p level of < .05.

Table 5. ANOVA Parent Perceptions of Telehealth Treatment Helpfulness by Symptom Category by Diagnostic Category.

Predictors		Sum of Squares	df	Mean Square	F	Sig.
Telehealth Treatment of Behavior	Between Groups	24.454	2	12.227	4.545	.014
	Within Groups	177.546	66	2.690		
	Total	202.000	68			
Telehealth Treatment of Social Skills	Between Groups	38.303	2	19.152	7.782	.001
	Within Groups	164.897	67	2.461		
	Total	203.200	69			
Telehealth Treatment of School Demands	Between Groups	19.108	2	9.554	5.291	.008
	Within Groups	99.323	55	1.806		
	Total	118.431	57			
Telehealth Treatment of Adaptive	Between Groups	.292	2	.146	.078	.925
	Within Groups	101.638	54	1.882		
	Total	101.930	56			

Note: One-way ANOVA analysis demonstrated conditions of perceived efficacy of online treatment by symptom category by diagnostic severity were statistically significant at a p level of <.05. This was evidenced in Treatment of Behavior, Social Skills, and Treatment of School Demands.

Significant results were identified in treatment of behavioral symptoms $F(2,66) = 4.545, p = .014$, social skills $F(2,67) = 7.782, p = .001$, and school demands $F(2,55) = 5.291, p = .008$. To identify groups that had statistically significant differences, use of a Post Hoc Tukey HSD test was utilized.

Results of Post Hoc analysis identified significant differences between age groups 2-10 and 11-18 under the condition of telehealth treatment of social skills $F(2,67) = 4.127, p = .02$.

Interpretation of the significant differences between the groups identified in **Table 6** noted standard error measurements to be between .541 and .425 indicating good representation of the population means. Additionally, F values ranged from 4.545 to 7.782 indicating significant differences between the groups.

Results from Post Hoc tests indicated significant differences for treatment of Behavioral symptoms using telehealth between diagnostic severity groups mild and severe with a p value of .01. Results from Post Hoc tests indicated significant differences for treatment of social skills using telehealth between diagnostic severity groups mild with moderate (.004) and more significant mild with severe (.002). Results from Post Hoc tests indicated significant differences for treatment of school related demands using telehealth between groups mild with moderate (.027) and again more significant mild with severe (.01). Results assessing telehealth treatment of adaptive skills had no significant differences and was not endorsed to be significantly helpful by parents.

The third area of inquiry was focused in assessing and identifying areas that parents endorsed to be especially

helpful in uses of telehealth/online therapies. These items were supported and identified by previous researchers [1], 3, and Pancy and Shvedovskiy (2020) and their research studies included in the review of literature. Items included; good rapport, good communication, providing necessary supplies, good support, good use of technology, and flexibility with scheduling. Parents were asked to endorse any items especially helpful for the treatment.

As demonstrated by **Figure 2**, aspects of telehealth/online therapy that were perceived to be especially helpful included firstly; flexibility with scheduling, good use of technology (limited technological problems), secondly; good communication, good support, and good relationship and lastly; providing necessary supplies.

In the fourth and last area of inquiry previously established, parent perception data was collected assessing perceived helpfulness of any received parent training. Analysis of variance as well as descriptive statistics were used to analyze and interpret the data collected (**Table 7** and **8**) (**Figure 3**).

Despite no observed significant differences in the one-way analysis of variance by age group $F(2,61) = .341, p = .712$ and by diagnostic severity group $F(2,61) = 2.673, p = .077$, descriptive statistics indicated 63.5% of parents perceived parent training to be helpful in contrast to 36.5% regardless of group (**Figure 4**).

As demonstrated by the table, major focuses of specialized parent training included managing behavioral symptoms (65.2%), developing social skills 52.2%. Other parent training programs were focused on managing changes in routine

Table 6. Post Hoc Analysis- Parent Perceptions of Telehealth Treatment Helpfulness by Symptom Category by Diagnostic Category.

Dependent Variable	(I) Dx Severity	(J) Dx Severity	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Telehealth Treatment of Behavior	Mild	Moderate	.862	.468	.163	-.26	1.98
		Severe	1.624*	.541	.010	.33	2.92
	Moderate	Mild	-.862	.468	.163	-1.98	.26
		Severe	.761	.492	.276	-.42	1.94
	Severe	Mild	-1.624*	.541	.010	-2.92	-.33
		Moderate	-.761	.492	.276	-1.94	.42
Telehealth Treatment of Social Skills	Mild	Moderate	1.495*	.445	.004	.43	2.56
		Severe	1.832*	.518	.002	.59	3.07
	Moderate	Mild	-1.495*	.445	.004	-2.56	-.43
		Severe	.337	.468	.753	-.79	1.46
	Severe	Mild	-1.832*	.518	.002	-3.07	-.59
		Moderate	-.337	.468	.753	-1.46	.79
Telehealth Treatment of School Demands	Mild	Moderate	1.133*	.425	.027	.11	2.16
		Severe	1.544*	.509	.010	.32	2.77
	Moderate	Mild	-1.133*	.425	.027	-2.16	-.11
		Severe	.410	.446	.630	-.66	1.49
	Severe	Mild	-1.544*	.509	.010	-2.77	-.32
		Moderate	-.410	.446	.630	-1.49	.66
Telehealth Treatment of Adaptive Skills	Mild	Moderate	-.100	.484	.977	-1.27	1.07
		Severe	.063	.537	.993	-1.23	1.36
	Moderate	Mild	.100	.484	.977	-1.07	1.27
		Severe	.163	.425	.923	-.86	1.19
	Severe	Mild	-.062	.537	.993	-1.36	1.23
		Moderate	-.163	.425	.923	-1.19	.86

Note: Post Hoc One-Way ANOVA analysis utilizing a Tukey HSD test demonstrated conditions of perceived efficacy of online treatment by symptom category by diagnostic severity category were statistically significant at a p level of < .05.

Table 7. ANOVA Parent Perceptions of Parent Training Helpfulness by Age.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.166	2	.083	.341	.712
Within Groups	14.834	61	.243		
Total	15.000	63			

Note: One-way ANOVA demonstrated conditions of perceived helpfulness of parent training of symptom category by age were not statistically significant at a p level of < .05

Table 8. ANOVA Parent Perceptions of Parent Training Helpfulness by Diagnostic Category.

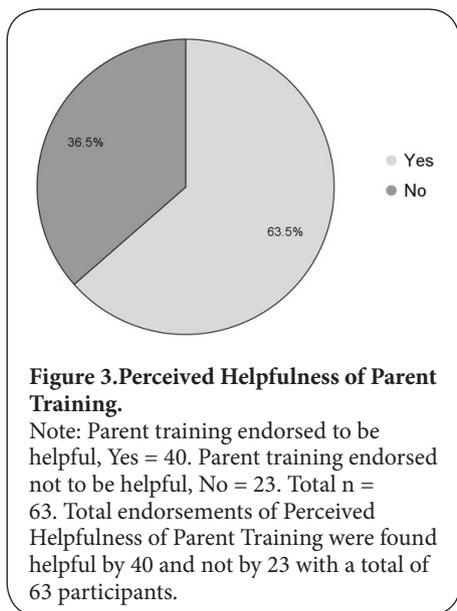
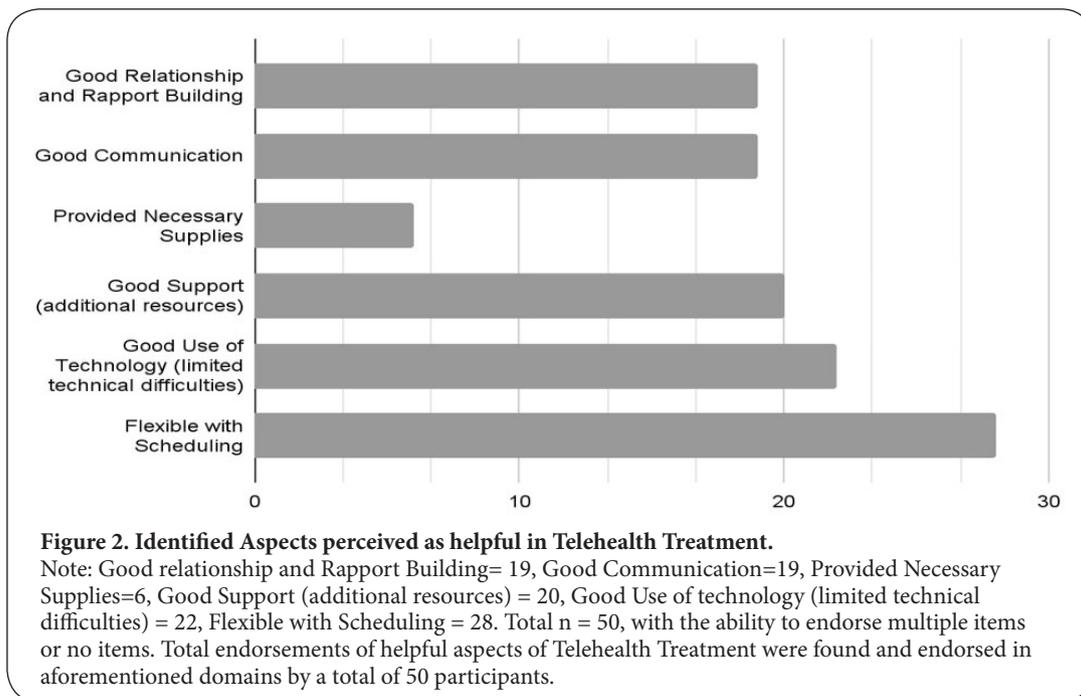
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.209	2	.604	2.673	.077
Within Groups	13.791	61	.226		
Total	15.000	63			

Note: One-way ANOVA demonstrated conditions of perceived helpfulness of parent training of symptom category by diagnostic severity were not statistically significant at a p level of < .05.

47.8%, establishing a reinforcement system 41.3%, creating a highly structured daily schedule 34.8%, and focusing on adaptive skills 30.4%. Additional responses included speech therapy and lack of parent training.

Supplemental Findings

Additional data was collected in a number of domains to add insight and understanding to the data. The data collected included parent perceptions of state restrictiveness, COVID-19



precipitated challenges, and locations of treatment services before and during the pandemic. Methods of data analysis used included descriptive statistics and linear regression/correlations (Figure 5).

Additionally, data was collected as to city/state/region COVID-19 restrictions and their effects on ASD related challenges. Descriptive statistics indicated 17.5% of respondents endorsed their city/state/region being less restrictive, 42.5% of respondents' city/state/region being in the middle regard-

ing restrictiveness, and 40% of respondents' city/state/region being most restrictive.

As demonstrated by Figure 6, parents overwhelmingly endorsed an evidenced increase in ASD related difficulties as a result of COVID-19 related changes (Table 9).

Results from a simple linear regression analysis indicated no predictive relationship between state restrictiveness and perceived increases in ASD related challenges as shown $b = .056$, $t(80) = 8.4$, $p = .173$ (Figure 7).

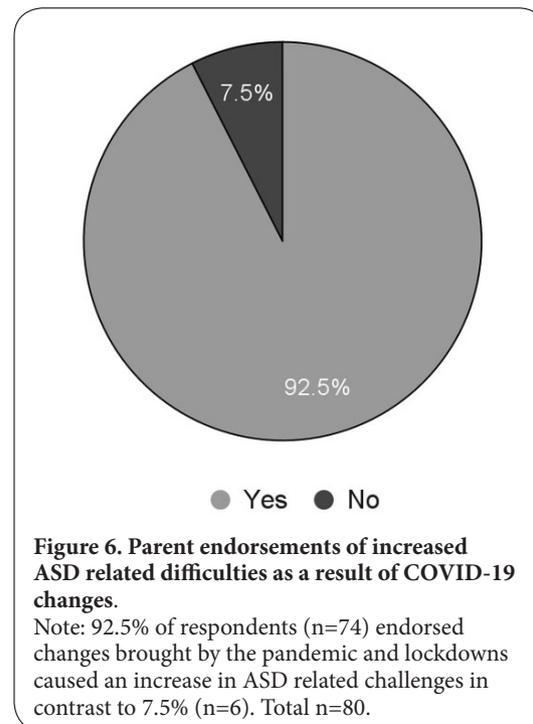
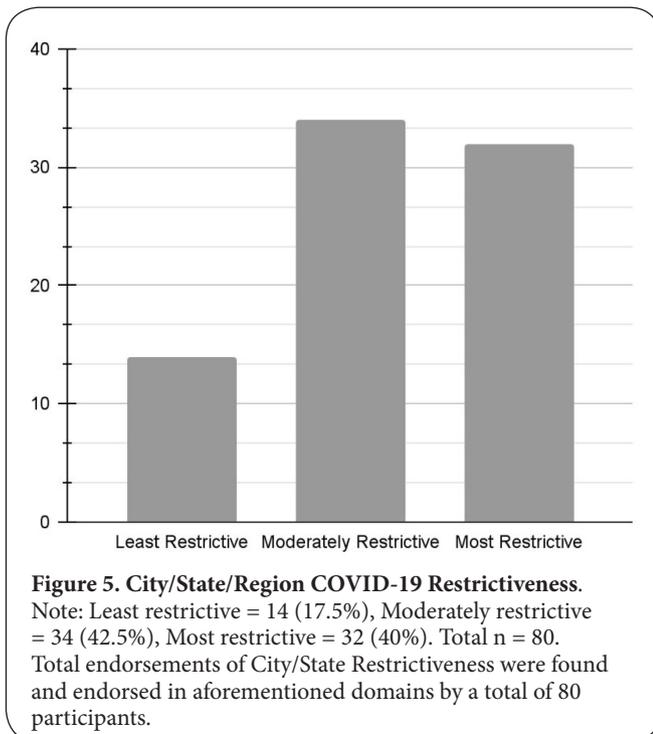
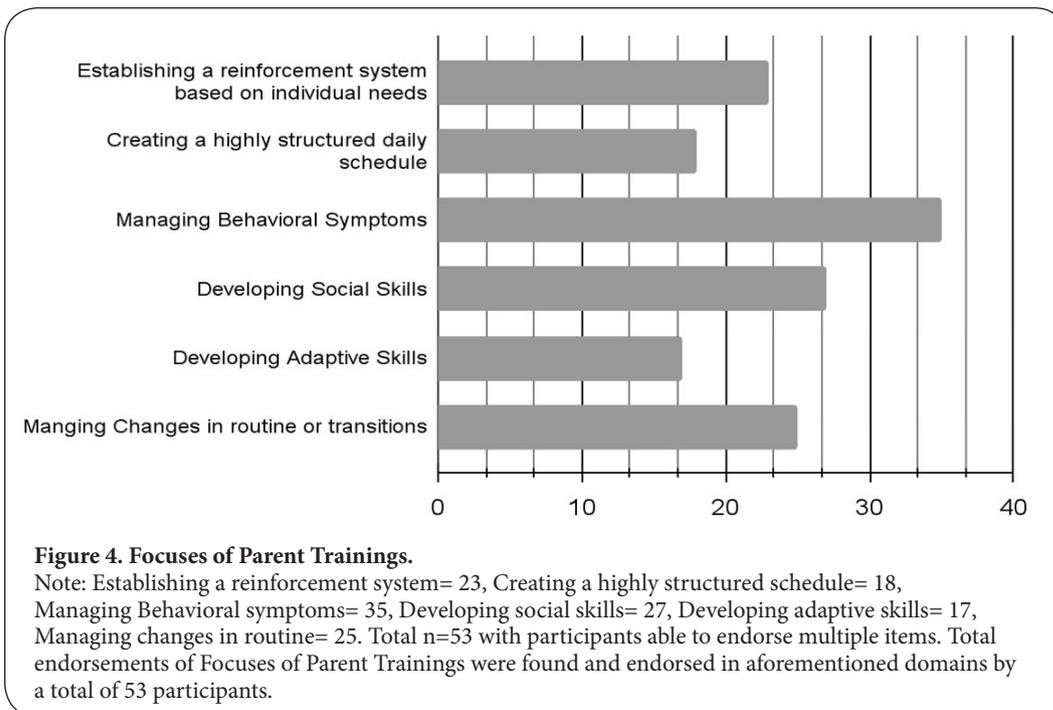
Additional descriptive data inquired to locations of services before and during the pandemic. As evidenced by the table services before the COVID-19 pandemic were similarly conducted at school 40, clinic 43 and home 42. During the pandemic there was a notable decrease in treatment services in school (16, decrease by 60%) and clinic (14 decrease by 67.4%). Home treatment saw an increase to 63 (increase by 50%).

Discussion

Support of Original Hypotheses and Interpretation

As previously established by researchers [7] and further supported in this study, changes brought about by the COVID-19 pandemic caused an increase in difficulties and stress in the Autism community at 93%. These findings were supported similarly by 92.5% of participants.

Findings assessing parent perceptions and answering the primary research questions demonstrated parental support in favor of in person treatments over remote/telehealth treatments for clients with Autism. These findings, although not established through differences between groups, were reflected in the descriptive data. As indicated by Figure 1, 85% endorsed in person treatment modalities to be more helpful



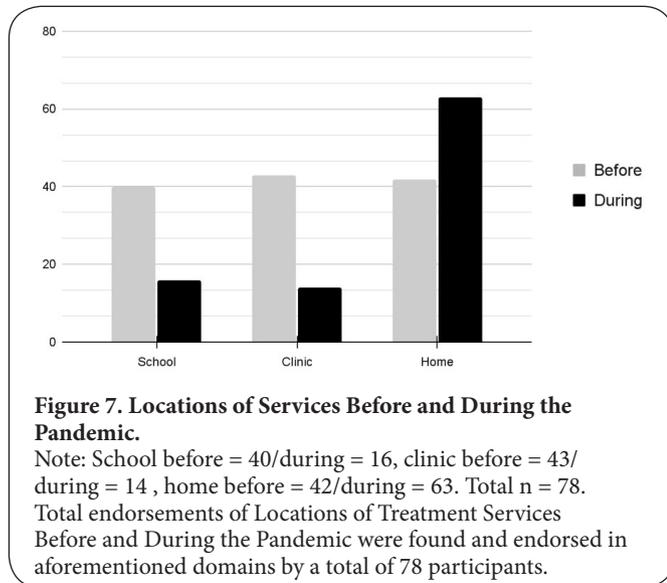
than online/remote treatment modalities (15%). These findings were supported across all conditions (age and diagnostic severity). To gain a more detailed understanding as to why in person was preferred can be best described by both symptom category findings and previous research in autism treatment.

Assessment of telehealth perceived efficacy also provided valuable clinical information contributing to understanding future treatment and individuals with autism’s receptiveness to different treatments. There were a number of statistically significant differences between groups regarding telehealth/

Table 9. Linear Regression between State Restrictiveness and Difficulties precipitated by COVID-19.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.800	0.095		8.406	.000
State Restrictiveness	0.056	0.041	0.154	1.377	.173

Note: Dependent Variable: Pandemic changes cause Increase in Difficulties



remote treatment of symptom category by diagnostic severity and one by age.

Firstly, behavioral treatments done online or remotely were found to be significantly different between diagnostic severity categories of mild and severe. Those with a mild diagnosis were perceived to benefit more from behavioral interventions than those on the autism spectrum who present more severe.

Social skills treatments done via telehealth/remote were found to be significantly different by age groups 2-10 and 11-18 and between diagnostic severity categories of mild with moderate and mild with severe. There can be any number of reasons as to why the age groups of 2-10 and 11-18 had significant differences regarding telehealth treatment of social skills. One potential explanation could be a result of developmental levels in children at older ages. Children with ASD between the ages of two and ten often have treatment goals focused on behavioral domains and social skills domains could be tackled later at the eleven to eighteen age range.

Findings of significant differences by diagnostic severity groups were similarly received with the findings regarding behavioral treatments in that those with mild diagnosis benefited significantly more than those with moderate and severe diagnoses. School related demands treated via online/remote treatment were found to be significantly different between

diagnostic severity categories of mild with moderate and mild with severe. These findings were very similar with the findings regarding social skills treatments in that those with mild diagnosis benefited significantly more than those with moderate and severe diagnoses. Lastly, adaptive skills treatment completed via online/remote treatment were not found to be statistically significant in either age or diagnostic category.

These findings may have any number of explanatory variables. Behavioral, social skills, and school related interventions done via telehealth/remotely all were reported to benefit those with mild diagnosis over other diagnosis. Variables that could help explain the reason for this disparity could be that higher functioning individuals on the spectrum may manage sensory difficulties at a higher level, communicate more effectively, and may be able to manage other difficulties to benefit from treatment. Fortunately, descriptive data collected identified areas that may mitigate difficulties and impediments to telehealth success. These factors were provided by previous research studies [1, 3 Pancy & Shvedovskiy, 2020) and parents of individuals with ASD were able to identify prominent potential mitigating factors. Parent endorsements highly supported uses of flexibility with scheduling (56% of respondents), good use of technology (limiting technological problems) (44% of respondents) when engaging in online/remote therapy. These findings support the need, when conducting telehealth therapy, for clinicians to be flexible with scheduling, rescheduling, and canceling to adapt to the volatile nature of treatment as well as needing good technology, limited connectivity problems and other problems to ensure best treatment. They endorsed secondly and less significantly; good communication, good support, and a good relationship/rapport.

As previously mentioned, parent training programs were another focus for the current study. More specifically, parent perceptions regarding the helpfulness of parent training programs. Parent perceptions of helpfulness were endorsed to be helpful at 63.5%. There were no statistically significant differences between groups of age and diagnostic category regarding parent perceptions of parent training programs, meaning no specific population benefitted more than another in parent training. Areas endorsed to be focuses of parent trainings included behavioral symptoms (66%), developing social skills (50.9%) and lesser areas included managing changes in routine (47.2%), establishing a reinforcement

system (43.4%), creating a highly structured daily schedule (34%), and focusing on adaptive skills (32.1%).

Supplemental findings supported increased difficulties with ASD related challenges regardless of state restrictiveness and notable changes in locations of services before and during the pandemic. Additionally, data was taken testing for a predictive relationship between city/state/region restrictiveness and increases in ASD related symptoms. There was no evidence for a predictive relationship between the variables. However, parents endorsed difficulties increased at 92.5% therefore meaning most individuals and families were negatively impacted regardless of city/state/region. Data was also collected to understand where services were conducted before and during the pandemic. As evidenced by **Figure 7**, services before the COVID-19 pandemic were similarly conducted at home (42), school (40), and clinic (43). During the pandemic there was a notable decrease in treatment services in school (16, decrease by 60%) and clinic (14 decrease by 67.4%). Home treatment saw an increase to 63 (increase by 50%). These changes in service location were evidently a result of COVID-19 measures of social distancing, essential business operations, and stay-at-home orders among many other contributors.

Similarity of Results

The findings of this study were consistent in multiple regards to the body of literature from which this study was derived. There were also a number of new findings that can benefit from additional research for validation. Perhaps first and foremost, findings from items assessing ASD symptoms and difficulties precipitated by changes brought about by the COVID-19 pandemic were consistent with previous research. [7] found 93% of families and clients with ASD saw an increase in frequency and severity of symptoms and an increase in stress. The item inquiring about similar experiences in the current study was endorsed at 92.5%. These findings were additionally tested in the current study by state restrictiveness. There was no relationship between state restrictiveness and increases in ASD related difficulties. Similarly, data comparing locations of treatment services was derived from understanding measures taken to socially distance and other precautionary measures taken in response to the global pandemic.

Another topic validated through other researchers included beneficial components aiding telehealth treatments. [1], 3, Pancy and Shvedovskiy (2020) and the current study supported uses of flexibility with scheduling 56%, good use of technology 44% (limiting technological problems) when engaging in online/remote therapy among other factors; good communication, rapport, and resources. The only item that had not received support or validation identified in the previous research included providing necessary materials and supplies. Findings were also consistent with [3], that telehealth should be supplemented with in person treatments and not done exclusively.

Telehealth treatment by symptom category had not been found or explored in the literature review prior. However, the assumptions made in establishing hypotheses for these research questions were done using details from the DSM-V [10]. Information from the DSM-V suggested there may be differences in telehealth treatment receptivity by age and diagnostic severity. These assumptions were validated in significant differences between groups of diagnostic severity. Hopefully, understanding which populations benefit most from telehealth can fill the gaps in the research identified by [1].

Lastly, results assessing parent training programs were consistent with the body of literature from which they were derived. [4] and [15] had identified the importance of involving parents and promoting parental buy-in to treatment and the potential for more positive outcomes. These findings were also validated, and treatment adherence was shown to be much higher when parents were involved. The current study found that the parent training programs implemented the majority but not a large majority found those programs to be helpful. Additionally, the current study aimed to identify which programs were most often implemented. These included managing behavioral symptoms, developing social skills and lesser areas included managing changes in routine, establishing a reinforcement system, creating a highly structured daily schedule, and focusing on adaptive skills. Previous parent training analysis identified in the research had not provided much assessment of helpfulness and the current study attempted to provide this measure.

Generalizability

Overall assumptions of generalizability and transferability indicate a fair measure of power regarding the uses of analysis of variance. Sample size and power calculations indicated sample sizes by each group were satisfactory for diagnostic severity groups but not for all age groups. The age group of "Above 18" had fewer responses inhibiting the generalizability for any assumptions within that group. Despite the weaknesses of having a low sample size that decreased the power in the statistical analysis many of the findings were consistent with findings within similar research studies. Descriptive statistical methods further endorsed similar findings that have been established in the literature.

Approaches have been aimed at increasing the validity, reliability, and replicability of the current research. One area of inquiry could criticize the content, construct, and instrumental validity as the measure/survey was not normed nor did it undergo a factor analysis establishing statistical support for its uses. Due to the special circumstances of the pandemic, there were not any available measures to use or compare against, however there may have been measures established in the literature recently of use. Similarly, the findings are consistent with previously established findings in the literature supporting the survey items and their valid uses. Reliability concerns are similarly framed questioning the reliability of

the measure. Test-retest reliability and interrater reliability measures have not been conducted but follow up studies could provide additional reliability support. The current study has outlined the procedure, recruiting processes, and statistical approach, hopefully supporting replicability of the study.

Clinical Implications

There are several clinical implications from the current study regarding uses of telehealth/online therapy, and areas perceived by parents to be especially helpful in treatment.

Parents supported uses of certain aspects of telehealth therapy but more so supported uses of in person treatment services. Parental endorsements supported when engaging in telehealth therapy, services should include flexibility with scheduling, measures to decrease technological problems, and to a lesser degree to communicate effectively, good rapport, and good support (additional resources). General takeaways from the data include when engaging in telehealth therapy they are best done applying the components and preferably with some form of in-person component.

Parents also endorsed the uses of telehealth to be best suited for those with mild diagnostic specifications in contrast to those with more severe diagnosis as well as skills appropriate for a client's developmental level. This was evidenced in treatment of behavioral symptoms, social skills, and school related demands. It was evident in the findings that parents of individuals with more severe diagnosis did not find telehealth treatment as helpful for behavioral, social skills, school related demands and adaptive domains. If conducted, telehealth treatment services to more severe diagnosis should absolutely incorporate helpful factors identified in [Figure 2](#).

Parent training programs implemented during the pandemic were also assessed within the current study. Overall findings demonstrated 63.5% of parents found parent training to be helpful. No data was collected assessing what was considered helpful or unhelpful about parent training. Areas endorsed to be focused on parent training included behavioral symptoms, developing social skills, and lesser areas included managing changes in routine, establishing a reinforcement system, creating a highly structured daily schedule, and focusing on adaptive skills. Additional investigation could explore which domains were perceived as more helpful in parent training and why a small majority of parents found parent training helpful. Overall assumptions of parent training indicate helpfulness in contrast to not being helpful and should be further developed to improve results.

Final clinical implications derived from the results of the study suggest disruptions of services were evident across all ages and diagnostic categories regardless of state restrictiveness. Changes in service locations were also evident as a result of COVID-19 which also has clinical implications as well.

Limitations

Limitations identified from the research design and follow

through included a lower than optimal sample size, limited access to target population, limited support for the measurement tool, and lastly some areas of inquiry that could have had additional investigation. Firstly, as previously mentioned an optimal sample size would have included 200-300 responses. This would have ensured optimal group sizes increasing the generalizability of the results. Secondly, access to parents of individuals with autism was limited in the recruitment process. Although uncertain, it can be assumed that most participants were recruited through social media platforms like Facebook and Instagram. Despite efforts for the survey to be posted through Autism resource websites and service providers there was limited circumstances of those plans coming to fruition due to a number of factors. These factors included; institutional barriers and procedures for releasing research to their populations, and lack of consistent communication enough to post the survey with reasonable time. Certain organizations such as schools, treatment institutions and resource websites had a number of restrictions for disseminating research. These restrictions ranged from not allowing research at all to requiring extensive information of the research, and IRB approval information. These procedures and restrictions were adhered to as much as possible. Additionally, lack of communication was a limitation for disseminating the research. Most often, methods used to reach out to organizations was via email. Some organizations responded to emails rarely or in a limited capacity, lessening the time frames making the survey available once having gone through the institution's restrictions. This limitation may have had effects on the data collection process and results. Another limitation mentioned previously notes the validity and reliability issues of the administered survey. Lastly, upon conclusion of data analysis it was evident additional data could have been collected to provide more detailed information into the research topic. For example, inquiries for parental understanding for beneficial and aspects of parent training or parent training programs would have been helpful.

Another noted limitation within the study includes the recency bias, hindsight bias, or latency bias in responding to events having occurred in the past. As individual states and cities open and allow patients to continue in person services, effects of the pandemic may be forgotten or poorly remembered or may even only remember experiences that were stronger in nature. Some clients and client families may have only been locked down for a short while while others may still be in a lockdown. This range of experience may have bias in manners of responding.

Recommendations for Future Study

In carrying out the study there are a few recommendations for future research should a similar study be conducted. One area that could provide more information and understanding to autism treatment could be investigating reasons parent training programs were endorsed at 63.5% and not higher.

Investigations into what parents perceived as beneficial to parent training, which parent training topics were most helpful, and what could be done to improve could be helpful. Another area that could inform future practice and research could be factor analysis or establishment of a measure used to assess and evaluate in person and telehealth treatment modalities.

Conclusion

In conclusion, immediate findings support previously established findings that the COVID-19 pandemic negatively impacted individuals and families managing ASD related difficulties. Parents endorsed uses of in person treatment to be more helpful than telehealth/online modalities. Parents also endorsed individuals with mild diagnostic specifications benefitted more than more severe specifications from telehealth interventions focused in behavioral treatment, social skills treatment, and managing school related demands. Lastly, parent training programs were endorsed to be helpful but have room for improvement.

Competing interests

The author declares that he has no competing interests.

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