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A PILOT STUDY EXPLORING THE EFFECTIVENESS AND FEASIBILTY OF THE PEERS® INTERVENTION IN A RURAL/NON-METROPOLITAN SETTING

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ABSTRACT

Autism Spectrum Disorder (ASD) is classified as a neurodevelopmental disorder characterized by deficits in social communication and restricted and repetitive patterns of behavior. Autistic adolescents often experience a myriad of mental health difficulties which are worsened by lower overall levels of social support. Higher rates of mental health difficulties are reported in rural and non-metropolitan areas where resources are less readily available. Interventions aimed at increasing social skills in autistic adolescents have proven to be an effective way to increase levels of social interaction and support. The Program for the Education and Enrichment of Relational Skills (PEERS®) intervention was developed to address social skills in autistic adolescents and train their parents to be ongoing social coaches. PEERS® has been used in many countries and contexts, although there has yet to be published evidence of its effectiveness in rural and non-metropolitan areas. The present study aimed to explore the effectiveness of the PEERS® intervention in a rural/non-metropolitan clinical setting via a variety of self, parent, and teacher report measures. Results indicated an increased level of knowledge of social skills by participants. Significant improvement was not consistent in participants related to friendship quality, social deficits, and the frequency of get-togethers. Findings support the need for future research in rural and non-metropolitan areas and the use of social skills interventions as a way to increase accessibility of such programs.

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PLAIN LANGUAGE SUMMARY

Autism Spectrum Disorder (ASD) is a condition where people have trouble with social communication and have repetitive behavior and interests. Autistic teens often have mental health issues, especially in rural areas where there are not as many resources. One way to help them is through programs that teach social skills, like the Program for the Education and Enrichment of Relational Skills (PEERS®). This study looked at whether PEERS® could help autistic teens in places where few people live such as rural and non-metropolitan areas. We found that participants learned more about social skills, but they did not always improve in other areas like getting together with friends or having fewer social problems. The study suggests that more research is needed to see how well these programs work for people living in rural and non-metropolitan areas.

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Introduction

The prevalence of children and adolescents diagnosed with autism spectrum disorder (ASD) has continued to rise, with recent estimates being 1 in 44 children receiving a diagnosis in 2018 compared to 1 in 150 in 2002 (Maenner et al., 2021; Cardinal et al., 2021). ASD is characterized by deficits in social communication and restricted/repetitive patterns of behavior, interests, or activities along with sensory sensitivities and inflexible adherence to routines (American Psychiatric Association [APA], 2022).

Although many autistic adolescents live fulfilling and productive lives, others experience distress related to the features of ASD. For instance, autistic individuals often display deficits in social communication leading to decreased quality and frequency of socialization with peers (Kimhi, 2014). With decreased opportunities for socialization with peers, autistic adolescents report feeling both socially isolated and neglected as well as rejected by their peers (Hymas et al., 2022). Social neglect and rejection can lead to a host of difficulties including increased reported rates of depression and anxiety when compared to typically developing adolescents (Lai et al., 2019). With increased rates of mental health diagnoses among autistic youth, the need for psychological intervention is clear.

Although many interventions for autistic individuals exist, very few have historically focused specifically on real-world skills for social interaction—in other words, skills that are effective outside the intervention setting. Many interventions focus on mental health diagnoses themselves rather than underlying contributors such as social skills deficits. Additionally, few interventions focus on the social relationships the participants have with others (e.g. their parents, siblings, peers) and fewer still include the caregivers of the participant as interventionists themselves (Wolstencroft et al., 2018).

In reaction to the lack of existing interventions focused on targeting social skills, Laugeson et al. (2009) developed the Program for the Education and Enrichment of Relational Skills (PEERS®). Positive and lasting gains in social skills and the quality/quantity of relationships has been demonstrated for adolescents who complete the PEERS® curriculum (e.g., Laugeson et al., 2009; Schohl et al., 2013). Although much evidence exists as to the effectiveness of PEERS® there has yet to be an examination as to its effectiveness in a rural or non-metropolitan setting. In examining the effectiveness of interventions with specific populations, the use of pilot studies may be employed. Small sample studies can be used to gain perspective as to whether or not an intervention or research is feasible with the targeted population (In, 2017). Thus, it is important to expand the evidence base for intervention such as PEERS® in settings outside of its original population.

Because the PEERS® intervention was developed in an urban setting (University of California Los Angeles), it is important to examine what adaptations may be necessary to best implement it in rural and non-metropolitan areas where access to appropriate diagnostic and intervention services is typically much more limited (Antezana et al., 2017). As no larger studies have been published on the nuances and effectiveness of PEERS® intervention in rural and non-metropolitan areas, smaller studies such as the present pilot study are necessary. The ultimate goal of the present study was to contribute to the literature with regard to the feasibility and effectiveness of the PEERS® intervention with a specific population (adolescents from rural and non-metropolitan areas). Additionally, the results of this study can be used to inform culturally appropriate adaptations for the PEERS® intervention with the specified population.

Literature Review

In order to understand the need for the current study, literature associated with the topic was examined before presentation of the results. Specifically, literature regarding autism spectrum disorder (ASD) in adolescents was considered following by a review of social skills interventions for autistic individuals. Due to the location of the proposed research, particular attention was given to literature focused on ASD and interventions in rural and non-metropolitan areas. A review of Evidence Based Practice (EBP) and pilot studies will lead into the study's purpose and the research questions for the study. Finally, method and overall results of the study and related discussion and conclusions were presented.

Autism Spectrum Disorder (ASD)

Autism was first described in the 1940's by psychologist Leo Kanner who described children who had an "obsessive desire for sameness" and a preference for being alone (Christian, 2006). The term "autism" itself was taken from Eugen Bleuler who used it to label aspects of children with previously diagnosed schizophrenia. Although it is likely that many of these children diagnosed with schizophrenia actually had autism (Kroncke et al., 2016). Although Kanner observed deficits in social interactions and communication, he noted the absence of other symptoms associated with schizophrenia (e.g., hallucinations, paranoia), leading to the conceptualization of autism as a separate diagnosis (Klinger et al., 2014).

Austrian pediatrician Hans Asperger also engaged in research focused on children with mental disorders in the 1940's. He observed children with repetitive behaviors and delays in communication, although he also noted they often had typically developing language abilities (Klinger et al., 2014). Asperger described of the children he observed as having "high levels of original thought," and being "highly verbal and seemingly quite bright despite excessive fixation on their specific interests (Kroncke et al., 2016). These descriptors were used to develop the initial diagnosis of Asperger Syndrome that was used in earlier editions of the DSM (Diagnostic and Statistical Manual of Mental Disorders) such as the DSM-IV When compared to the children that were observed by Kanner, those who Asperger researched had lower levels of support needs (i.e., language levels, adaptive behaviors, social interactions, behavioral flexibility; Christian, 2006). Thus, Asperger Syndrome and Autistic Disorder were classified as separate diagnoses in earlier editions of the DSM (Kroncke et al., 2016).

With the release of the fifth edition of the DSM (DSM-5) in 2013, Asperger Syndrome, Autistic Disorder, and other neurodevelopmental disorders (e.g., Rett's Disorder, Childhood Disintegrative Disorder, Pervasive Developmental Disorder) were combined into one diagnosis (ASD). ASD in the DSM-5 and DSM-5-Text Revision is conceptualized into two domains—deficits in social communication and restricted and repetitive behaviors (APA, 2022).

The adaptation to the spectrum model of autism outlined in the DSM-5-TR (APA, 2022) is viewed by many to more effectively capture a multi-categorical diagnosis into a dimensional framework (Rosen et al., 2021). Critics of the change voiced concerns over losing a part of their identity/community (especially related to Asperger's disorder). Others on the spectrum worried of losing services if they did not meet the new criteria for ASD (Rosen et al., 2021). Despite such concerns, the diagnostic criteria for ASD outlined in the following section were found to have improved diagnostic specificity and sensitivity (Huerta et al., 2012).

Language Use

As with the changing diagnostic criteria for ASD, the language used to describe people who meet criteria for ASD has also evolved over time. Preferences for identity-first language (e.g., autistic person) and person-first (e.g., person with autism) vary in the self-advocate and research communities. At the time of writing, style guides and best practices generally recommend using person first language in written documents, however, 87% of autistic adults prefer identity-first language and terms like “autistic” (Taboas et al., 2023).

To consider the roles of neurodiversity, clinical accuracy, and the general preferences of the autistic community, identity-first language such as “autistic” will be used throughout this dissertation except in cases where the *diagnosis* of ASD is being discussed. It is important to consider that even with a majority of autistic individuals preferring identity-first language, the community is far from homogenous in their preferences. As such, it is necessary to consider individual preferences when working with people on the spectrum.

Characteristics of ASD

Although both social communication deficits and restricted/repetitive patterns of behavior must be present in order for an individual to receive a diagnosis of ASD, presentations vary leading to a “level” of impairment being included in the diagnosis. Level 1 is considered least severe or “requiring support,” while Level 3 is considered more severe or “requiring very substantial support” (APA, 2022). The DSM-5-TR (APA, 2022) classifies levels on dimensions of both social communication and restricted, repetitive behaviors. An overview of the levels along with examples is presented below in Table 1.

Table 1:

Autism Spectrum Disorder Severity Levels

Autism Spectrum Disorder Severity Levels		
Severity Level	**Social Communication**	**Restricted, repetitive behaviors**
Level 3 *Requiring very substantial support*	Severe deficits in verbal and nonverbal social communication skills. Very limited initiation of social interactions. May not use many	Extreme difficulty adapting to change. Restricted/repetitive behaviors markedly interfere with functioning.

	words. May not respond to social approaches.	
Level 2 *Requiring substantial support*	Marked deficits in verbal and nonverbal social communication skills. Impairments even with supports in place. May use fewer words.	Difficulty adapting to change and other restricted/repetitive behaviors obvious to the casual observer. Some interference with daily functioning.
Level 1 *Requiring support*	Difficulty initiating social interactions. Appearance of disinterest in social interactions. Attempts to make friends may be unsuccessful.	Difficulty switching between activities. Problems with planning and organization may hamper independence.

Note. Severity levels vary across individuals as well as between the two criteria areas necessary for a diagnosis of ASD. Although they vary, all individuals must display symptoms of at least level 1 in the domains of social communication and restricted, repetitive behaviors in order to receive a diagnosis of ASD (although the overall level of diagnosis is taken from the higher severity level of the two) (APA, 2022).

Social Deficits in ASD

As mentioned, the diagnosis of ASD is marked by social deficits as the first necessary criterion. Diagnostic social deficits as defined by the DSM-5-TR include each of three areas: social-emotional reciprocity, nonverbal communication, and developing, maintaining, and understanding relationships (APA, 2022).

Deficits in Social-Emotional Reciprocity. Autistic individuals may struggle with initiating and participating in conversations in a meaningful way. Additionally, they often have difficulty understanding nuances of appropriate conversational give-and-take (Hall et al., 2018). This reduced comprehension of unwritten rules such as turn-taking and maintaining appropriate topic of conversation can lead to a reduction of empathy and engagement with peers (Harmsen, 2019).

Because of poor topic initiation and the use of repetitive conversational themes related to perseverative interests, autistic individuals may have a difficult time understanding that conversational partners also have interests, thoughts, and emotions of their own. Furthermore, they often have a difficult time identifying emotions in others leading to a decrease in the formation of meaningful connections (Kimhi, 2014).

Deficits in Nonverbal Communicative Behaviors. Along with social-emotional reciprocity, autistic individuals also have trouble with nonverbal behaviors typically used in communication (e.g., eye contact, body language) and the integration of verbal and nonverbal behaviors (e.g., using gestures while speaking) (APA, 2022). Although viewed as an important aspect of nonverbal communication, literature suggests that autistic individuals often have aversive reactions to making direct eye-contact (Tanaka & Sung, 2016). Even so, without viewing others' faces, autistic individuals can have a difficult time reading emotions and other nonverbal cues and ultimately affect their ability to judge others' reactions to social interchange.

Deficits in Developing, Maintaining, and Understanding Relationships. The third criterion in the category of social communication deficits in ASD relates to an individual's understanding of relationships (APA, 2022). Although social motivation may be impaired in some autistic individuals (Chevallier et al., 2012), the literature suggests that most autistic individuals do in fact want social relationships with others (Jaswal & Akhtar, 2019). Even when they do desire friendship, many autistic individuals have a poor understanding of what defines a "friend" and how best to engage in developing such friendships (Sosnowy et al., 2019).

The deficits in skills necessary to make, keep, and understand friendships understandably cause difficulties within relationship development for autistic individuals, leading to high overall levels of social isolation and loneliness (Hymas et al., 2022). Along with these difficulties, autistic individuals also display restricted/repetitive patterns of behavior, interests, and activities which can further lead to social difficulties and consequences thereof.

Restricted/Repetitive Patterns of Behavior, Interests, and Activities

Along with deficits in social communication, a diagnosis of ASD also requires restricted/repetitive patterns of behavior, interests, and activities. Specifically, the DSM-5-TR necessitates the presence of at least two of four of the following criteria:

1. Stereotyped or repetitive motor movements, use of objects, or speech.
2. Insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior.
3. Highly restricted, fixated interests that are abnormal in intensity or focus.
4. Hyper- or hyporeactivity to sensory input or unusual interest in sensory aspects of the environment. (APA, 2022).

Restricted/repetitive patterns of behavior, interests, or activities may negatively impact the likelihood of successful social interactions for autistic individuals, although not as directly as deficits in social communication (Kuzminskaite et al., 2020). For example, autistic individuals may insist on discussing topics and participating in activities related to their own fixated interests which can diminish the quality of interaction with others—particularly in adolescence (Kuzminskaite et al., 2020).

While the restricted/repetitive patterns of behavior, interests, and activities contribute to relational difficulties, they manifest in much the same way as deficits in social communication (e.g., behavioral rigidity or hyperreactivity to sensory input leading to fewer interactions with others). Because of such social deficits and the presence of restricted/repetitive patterns of behavior, interests, and activities, autistic individuals often experience a host of social difficulties.

Variability in ASD

As autism is a “spectrum” disorder, autistic individuals vary widely in how their diagnosis impacts their lives. The phrase “if you’ve met one person with autism, you’ve met one person with autism” highlights the variability and uniqueness of individuals on the spectrum.

Current diagnostic criteria require the presence or history of some social difficulty as outlined in the previous sections. Likewise, at least two of the four previously outlined restricted/repetitive patterns of behavior, interests, and activities must be present or reported historically to meet criteria for ASD (APA, 2022).

The relative looseness of diagnostic criteria related to ASD account for the extreme variability of autistic individuals. For instance, someone who does not engage in verbal communication and struggles with shifting between two tasks could receive the same diagnosis as someone who communicates verbally and is flexible with transitions but may struggle with integration of verbal and nonverbal behaviors.

Just as differences between individuals diagnosed with ASD are common, it is also common for autistic traits to change within an individual throughout their lifespan. Because ASD is a developmental disability, it is known to be present throughout the lifespan and not solely in childhood. As autistic children grow up, the demands of their environment change (e.g., going to school, gaining employment). As such, the challenges they face also change. For instance, many autistic individuals may adapt well to the structure of middle/high school but require support with applying to and beginning college (Sefotho & Onyishi, 2021).

Global and Cultural Differences. Although diagnostic classifications of autism exist worldwide, a critical look at research shows a focus mainly on high-income western countries (e.g., Abubakar et al., 2016, Hahler & Elsabbagh, 2015). While fewer than 20% of the world's population lives in these relatively resource-dense areas, nearly all research on ASD is conducted with the populations in western countries (Durkin et al., 2015). Furthermore, most studies in western countries severely underrepresent racial, ethnic, and other minoritized populations in research related to autism and other developmental disabilities (West et al., 2016).

While a paucity of literature and diagnostic tools exist for low- and middle-income countries and with minoritized populations in high-income countries, tools are being developed to address these discrepancies. For instance, diagnostic tools such as the Autism Diagnostic Interview-Revised (ADI-R) has been adapted into Spanish—although sensitivity and specificity of ASD diagnosis was lower than in the English administration (Abubakar et al., 2016). Other tools have been adapted as well, although attention is generally focused more on translation with less consideration given to cultural context (Al Maskari et al., 2018). To study the role of cultural context in the diagnosis of ASD, de Leeuw et al., (2020) recommend considering four domains: the expression of ASD symptoms, the recognition of ASD symptoms, the interpretation of ASD symptoms, and the reporting of symptoms to professionals.

Related to cultural differences in ASD, it appears that symptoms are relatively universal. Rather, differences occur in identification—with identification of ASD to be generally lower in minoritized ethnic groups and low- and middle-income countries compared to more affluent countries. Additionally, when individuals from minoritized ethnic groups are identified as having ASD, they tend to require higher levels of support than those in white populations (Tromans et al., 2021). These findings suggest that individuals in under-resourced areas may have more difficulty accessing services than in areas that have more resources.

Consequences of Social Deficits

Developmentally, friendships between adolescents typically have best friends as part of their social network by fourth grade (Frankel, 1996). Along with family ties, having social connections in the form of friendships is important for adjustment throughout the lifespan (Fiori & Windsor, 2020). Moreover, having meaningful and positive friendships during adolescence is shown to play an important role in cognitive, social, and emotional development (Rubin et al., 2015; Bagwell & Schmidt, 2011; Berndt, 2002). In typically developing adolescents, conflict among peers may intuitively lead to decreases in the quality and frequency of future interactions, however, with conflict resolution skills, conflict between best friends can lead to increases in problem-solving abilities and improve relationships (Nelson & Aboud, 1985). Due to previously discussed social deficits, autistic adolescents can struggle with the skills necessary to make and keep meaningful friendships leading to several consequences such as social neglect, peer rejection, peer conflict, and an overall lack of meaningful friendships. The following sections highlight these areas of concern.

Social Neglect and Isolation. Perhaps due in part to some autistic adolescents having difficulty with social initiation, or the perception that autistic individuals do not desire friendship, they are often the subjects of social neglect and isolation (Hymas et al., 2022). With difficulties initiating social interactions, autistic adolescents often have reduced overall social interactions. Because they may not engage as frequently as their typically developing peers, those with ASD may be seen as shy, socially withdrawn, or anxious and go unnoticed by their peers (Bauminger & Kasari, 2000). Without the opportunity to practice meaningful socialization with their peers, autistic adolescents may continue to struggle and fall further behind in their social development when compared to their typically developing peers (Bauminger & Kasari, 2000).

Peer Rejection. Of those autistic adolescents who do engage with peers, many may face unsuccessful attempts at socialization. Peer rejection may occur in part due to awkward interactions. Because they may engage in behaviors that are atypical in the eyes of their typically developing peers, autistic adolescents are at a higher risk for rejection and of being bullied (Forrest et al., 2020). Furthermore, adolescents without firm social connections are more likely to be bullied, so those autistic individuals who are socially neglected and isolated are at even higher risk (Forrest et al., 2020). Although there is variability in the responses adolescents have to being bullied, research indicates higher levels of anxiety, depression, self-harm and other psychological symptoms for those who have been bullied compared to adolescents who haven't. For instance, a meta-analysis found that bullying victimization is associated with an overall increase in psychological harm of up to 29.7% (Montes et al., 2022).

Along with their increased risk of being bullied, autistic adolescents may be viewed as bullies themselves. Considering autistic individuals are speculated to have reduced cognitive empathy, they may misread social cues and have trouble sharing emotions with others. (van Noorden et al., 2015). Certainly, anyone typically developing or otherwise could be considered a bully for a variety of reasons. Autistic adolescents may be viewed as being bullies due to not comprehending and/or adhering to social norms, they also may display emotional outbursts which may be viewed as bullying behavior whether or not the behavior was intended (Maiano et al., 2016).

Peer Conflict. To say that all autistic adolescents are unsuccessful at making friends and acquaintances is incorrect. Many autistic adolescents do have friends (Jaswal & Akhtar, 2019) and engage in meaningful conversations and activities. Even so, these adolescents may have trouble with appropriate conflict resolution skills leading to prolonged peer conflict. This is in part due to the tendency of autistic individuals to have difficulty with flexibility and comprehension of social nuances (Schreiter & Beste, 2020).

Conflict resolution skills are necessary to develop and maintain meaningful relationships throughout the lifespan but are especially important during adolescence when teens are learning to problem-solve (Nelson & Aboud, 1985). Conflict resolution is not only important for relationship building and maintenance but has also been shown to have an effect in reducing anxiety and depressive symptoms in teens (Skeen et al., 2019).

Lack of Friends. The importance of friendships in adolescence has been well demonstrated (e.g., Rubin et al., 2015; Bagwell & Schmidt, 2011; Berndt, 2002). Although autistic adolescents often desire such friendships (Jaswal & Akhtar, 2019), literature suggests that autistic individuals have fewer friends on average than their typically developing peers (Hoffman et al., 2021).

Along with fewer overall friendships, autistic adolescents also tend to have fewer reciprocal friendships (i.e., two-sided friendships). Because they may engage in restrictive and repetitive patterns of interest and behavior and struggle socially, autistic teens often do not have a developed sense of social norms associated with building friendships, leading to friendships that appear shallow or one-sided (Petrina et al., 2017). To summarize, autistic adolescents often face challenges in social relationships such as social neglect, peer conflict and rejection, and an overall lower number of friendships than their typically developing peers.

Mental Health Challenges

Adolescents have a higher risk for mental health challenges than the general population (LeMoult et al., 2020). Autistic adolescents are at an even higher risk than their typically developing peers, partially due to social difficulties and the tendency to have fewer friends (Lai et al., 2019). Although most mental health challenges are more prevalent in autistic youth, they are especially vulnerable to concerns related to emotion regulation such as depression and anxiety (Lai et al., 2019).

Depression. Depression is one of the most common psychiatric conditions in children, affecting approximately 12% of adolescents in the general population (Merikangas et al., 2010). Autistic adolescents are more likely to develop depression than their typically developing peers with estimates up to 26% (DeFilippis, 2018). Depressive symptoms are especially high in adolescents with "high functioning" (level 1) ASD, with cooccurrence rates as high as 54% (Lieb & Bohnert, 2017). This increased rate is likely due to the insight adolescents with "high functioning" ASD may have into their own social skills deficits compared with autistic teens with higher support needs (Mayes et al., 2011). This is to say, these individuals have the insight to understand that they have some difficulties with social interactions and feel different than their peers but require some assistance in gaining such skills. With this recognized social skills deficit, autistic adolescents may feel rejected or outcast, leading to higher rates of loneliness and depression (Mayes et al., 2011).

In addition to overall higher prevalence rates of depression in autistic adolescents, the trajectory of depression also seems to vary somewhat from the general population. For instance, one study found that autistic adolescents who develop depression as teens tend to report similar or elevated rates of depression well into adulthood (Gotham et al., 2015) while evidence suggests many typically developing teen report reduced rates of depression into adulthood (Fernandez Castelao & Kröner-Herwig, 2013).

As with typically developing adolescents, depression in adolescence is associated with increased risk for suicidality (Lieb & Bohnert, 2017). Both suicidal ideation and self-harm behaviors are shown to be higher in teens with social communication deficits such as ASD (Culpin et al., 2018). Although Culpin et al., (2018) found that teens with social deficits had increased risk of depression, self-harm, and suicidality, participants in the study had a variety of social communication deficits and were not formally diagnosed with ASD. This means that it is likely deficits in social skills that leads to increased mental health difficulties, and not specifically the diagnosis of ASD itself.

Anxiety. Much like depression, autistic adolescents are also more likely than their typically developing peers to experience symptoms of anxiety (Hymas et al., 2022). Van Steensel et al. (2011) found that around 40% of autistic youth met full criteria for at least one anxiety disorder (separation anxiety = 9.0%; generalized anxiety disorder = 15.4%; panic disorder = 1.8%; specific phobia = 29.8%; and obsessive-compulsive disorder = 17.4%). This is especially important considering the rate of anxiety disorders in the general population range from 3-5% (Bitsko et al., 2018).

In addition to the previously mentioned diagnoses, there are several ASD-specific types of anxiety reported in the literature, although these are not formal diagnoses themselves. Autistic adolescents report types of idiosyncratic specific phobias at much higher rates than their typically developing peers. For example, autistic adolescents have reported fears of toilets, certain foods, and other specific areas (Gjevik et al., 2011). Many of these specific areas relate to either sensory aversions or anxiety surrounding changes in routine (Lau et al., 2020).

Hyper- or hypo-sensitivity to sensory input is a hallmark trait of ASD (APA, 2022). Sensory aversions such as to specific sounds or textures likely contribute to the levels of anxiety related to idiosyncratic specific phobias (Lau et al., 2020). These sensory concerns may be further exacerbated due to uncertainty and the tendency of autistic individuals to struggle with change.

It is commonly understood that many autistic individuals function better in situations where uncertainty is minimized (Rodgers et al., 2016). This insistence on sameness can lead to anxiety in the inevitable situations when change or novelty is necessary. For instance, Kerns et al. (2014) found that 22% of their sample of autistic adolescents presented with symptoms of anxiety related to changes in their daily routines.

Rural and Non-Metropolitan Areas

The definition of "rural" is highly contested. Even within the United States government, the definition of rurality varies between agencies. For instance, the Census Bureau defines rural areas to be any census tract that has fewer than 2,500 people (Ratcliffe et al., 2016). Some agencies avoid the "rural" distinction altogether, instead classifying areas as metropolitan, micropolitan, and non-metropolitan (Mar, 2010). Indeed, on the federal level, there are over fifteen different classification systems for a rural/urban or related distinction making a universal definition nearly impossible ("The Federal Definition," 2013).

Bennet et al. (2019) outline the importance of including local individuals' experiences and perceptions in the definitions of population areas. They postulate that if people in an area define the area as rural, then it is a useful distinction to use. Likewise, they caution against using the unhelpful dichotomy of "rural vs. urban" when describing a location as these definitions tend to focus solely on population and ignore other helpful factors. Such factors could include population density, travel or distance, geographic isolation, resources, socioeconomic characteristics, local perceptions or culture, and amenities (Bennet et al., 2019).

Rural and non-metropolitan areas have been demonstrated to have fewer resources than urban population centers leading to a variety of negative impacts on social determinants of health (SDOH) or “conditions […] in which people are born, live, work, play, worship, and age that affect […] health, functioning, and quality of life outcomes and risks” (Office of Disease Prevention & Health Promotion, 2014). This distinction in SDOH and overall lack of resources (e.g., access to healthcare/mental healthcare, quality education, broadband internet) could be used as a way to better classify urban/metropolitan vs. rural/non-metropolitan.

In the spirit of accurately capturing the experiences of individuals from the area in which data collection for the present study took place, the broad terms “rural and non-metropolitan” are used throughout this dissertation. For example, some participants from the study came from “rural” locations and travelled to the site of intervention—which was slightly larger and could be considered “non-metropolitan” (Mar, 2010).

It is worth noting that individuals in the area the current study took place have limited access to autism diagnostic specialists. Furthermore, the intervention they participated in was the first of its kind in the area at the time of intervention (2021). The next sections focus on rural and non-metropolitan mental health and barriers to care as well as ASD specific concerns in rural and non-metropolitan areas.

Rural Mental Health

Approximately one in five individuals living in a rural area meets criteria for a mental illness (SAMHSA, 2013). It has long been understood that individuals in rural areas are more likely to face substance use and mental health difficulties than their counterparts in urban areas (e.g., Eberhardt & Pamuk, 2004; Summers-Gabr, 2020). Additionally, the suicide rate is much higher in rural areas than urban, with the rate of complete suicide nearing 1.5 times higher in rural areas than urban from 2001 to 2015 (Ivey-Stephenson et al., 2017).

Despite these high prevalence rates, individuals living in rural settings often struggle to receive adequate care for a number of reasons including rural identity, decreased access, and large geographic distance between providers (Cheesmond et al., 2019). Those in rural settings often have a view of themselves that is characterized by their ability to help themselves—leading to increased waiting times before seeking mental health services when compared to their urban counterparts (Green et al., 2012).

Along with some seemingly internal barriers to mental health treatment, individuals living in rural areas also have some objective barriers to seeking help. For instance, rural and non-metropolitan counties in the United States have far fewer psychologists and other mental health providers than urban counties (CDC, 2020). With fewer practitioners, it can be very difficult for those individuals who do seek treatment to receive care. Additionally, due to sparse population distribution, individuals in rural areas may have to travel excessive distances in order to receive intervention services (Summers-Gabr, 2020).

ASD in Rural and Non-Metropolitan Areas

The prevalence of ASD is thought to be nearly identical in rural and urban areas (Mohamed et al., 2016). Despite similar prevalence rates, individuals in rural and non-metropolitan communities have limited access to resources and professionals who can provide timely and accurate assessments and diagnosis and effective interventions for ASD (Green et al., 2013; Gona et al., 2016). The overall lack of diagnostic and treatment services for rural and non-metropolitan individuals combined with their on average lower education levels and socioeconomic status lead to disadvantages when compared to individuals from urban and metropolitan areas.

Diagnosis. Families of children with ASD who live in areas with smaller populations report having difficulty receiving formal diagnostic services (Antezana et al., 2017). They are told more often than families in densely populated areas to seek diagnosis through the school system rather than by medical providers themselves (40% in rural areas and 28% in urban areas; Center for Disease Control and Prevention et al., 2011).

Practitioners with experience working with families who have a child with ASD are typically located in sparsely populated and remote areas, making it difficult for families to receive services in a timely manner. Due to the lack of providers with the relevant knowledge and experience, rates of diagnosed ASD are 2.5 times lower than in rural areas than in urban areas despite epidemiological samples indicating near-equal actual prevalence rates (Williams et al., 2006).

Intervention. For those individuals who do receive prompt and proper ASD diagnoses in sparsely populated areas, they may still have difficulty accessing intervention services (Antezana et al., 2017). Although there has not been extensive ASD-specific research in rural areas, mental health services in general for children in rural areas are less-readily available than in urban settings (Cummings et al., 2015). This may be due to geographic difficulties (i.e. the need to travel long distances to receive appropriate services), or the overall lack of service providers in areas with smaller populations.

Although social skills intervention is important for the successful development and education of autistic adolescents, those in rural settings are less likely to pursue services due to geographic barriers and an overall lack of available options (Antezana et al., 2017). Limited resources, geographic barriers, and an overall lower population make research with autistic individuals in sparsely populated areas difficult, resulting in smaller sample sizes and the need for a more idiographic, individualistic approach to research (Fok et al., 2015). That is to say, although large studies involving ideal clinical setups are effective at demonstrating the usefulness of interventions, research in areas with lower populations (and fewer overall autistic individuals) requires adaptations to be successful and clinically useful for the individuals in these areas (Fok et al., 2015).

Social Skills Interventions

Because social skills are so important for academic performance, social functioning, and emotional development, they are often the target of intervention for those who may have social skill deficits such as those with ASD (Wolstencroft et al., 2018). Many existing social skills training protocols are rooted in theory rather than in practice. For instance, some interventions are based on the theory of mind. Theory of mind is used to examine one's perspective-taking ability (Baron-Cohen et al., 1985). Since many autistic individuals struggle with perspective-taking skills, focusing intervention on the skills involved in theory of mind makes theoretical sense.

Interventions aimed at increasing the ability to predict others' behaviors among autistic individuals developed first from theory of mind. Baron-Cohen et al., (1985) found that compared to their typically developing peers, children with ASD struggled with tasks aimed at measuring their perspective-taking abilities. Ozonoff and Miller (1995) developed an intervention aimed at teaching theory of mind skills to children with ASD. Although they were more or less effective in the clinical setting, individuals who participated in their intervention were unable to generalize to real world situations, indicating that the skills that were taught were not ecologically valid (Chang et al., 2022).

Ecologically valid skills are those that generalize beyond the intervention setting. For instance, some social skills training would recommend steps for meeting new people to include smiling, making eye contact, and introducing oneself. While this may work in some situations, it could be viewed as awkward and contrived. Instead, an ecologically valid way to approach meeting new people would include trading information and finding common interests (Laugeson et al., 2012). Although eye contact, friendliness, and introductions may be necessary, the focus on skills socially savvy people engage in (trading information and finding common interests) is what makes an intervention ecologically valid.

Interventions developed in the 1990's and early 2000's continued to focus on developing social skills of children and adolescents with ASD. A review of social skills interventions conducted by White et al., (2007) found that many interventions struggled to show meager improvements in social competency when looking at post-intervention parent measures. The same review also found that much like the Ozonoff and Miller (1995) intervention, these social skills interventions lacked generalizability beyond the intervention environment itself (White et al., 2007).

Social Stories

Social stories are often used as social skills training for children and adolescents with ASD. A social story describes a social situation using pictures showing characters demonstrating appropriate social skills. They are highly adaptable and customizable for social situations unique to individuals (Swaggart et al., 1995). With the ability to adapt social stories for individuals, they can be effective for virtually any social situation, although this may detract from their generalizability.

When social stories include direct instructions within the stories, they are shown to be more effective in teaching appropriate social skills such as game playing skills in children and adolescents (Quirmbach et al., 2009). They are also effective in reducing maladaptive behaviors and increasing overall social competence in both children with ASD and their typically developing peers. For instance, Sansosti et al., (2004) found that social stories can be effective for the reduction in aggressive behavior, increase in appropriate social greetings and sharing behaviors. These findings are likely due in part to the tendency of autistic individuals to respond better to direct feedback and social prompts rather than more nuanced social interactions including nonverbal means (e.g., gestures and facial expressions).

Group Interventions

In addition to social stories, small group interventions have been used to teach social skills to autistic individuals. One example is the SCORE skills strategy program (Webb et al., 2004). The program focused on five social skills taught in role plays and practiced in games (Share ideas, Compliment others, Offer to help or encouragement, Recommend changes nicely, and Exercise self-control; SCORE). Overall, the program appeared to be effective in increasing social skills of participants although some of the outcome was measured on parent satisfaction rather than on more meaningful metrics such as friendship quality or a reduction of specific social deficits related to ASD (Webb et al., 2004).

Typically developing peers are sometimes used as behavioral models for autistic adolescents. Hughes et al. (2013) developed a peer-mediated intervention in which typically developing high school students created and tracked social goals with a peer with ASD. Results of the intervention indicated that the peers with ASD achieved average ranges of social interactions and teachers noted positive changes in the autistic teens (Hughes et al., 2013). Despite these positive changes, the Hughes et al. (2013) intervention focused on school interactions and did not include parent involvement, leading to gains in positive social interactions likely being limited to the school setting.

Program for the Education and Enrichment of Relational Skills (PEERS®)

The PEERS® intervention is a 14- or 16-week intervention that is conducted with concurrent parent interventions that targets social skill development (Laugeson et al., 2012). PEERS® was developed as a response to the previously mentioned limitations of other social skills interventions and as a way generalize skills. Each weekly session lasts for 90 minutes and consists of concurrent teen and parent sessions comprised of didactic lessons and behavioral or cognitive rehearsals. Following each session, participants and their parents engage in weekly homework related to behavioral practice of skills learned during sessions. Parent sessions are focused on reviewing the previous week’s homework, practicing behavioral rehearsals, and troubleshooting any social coaching difficulties. The design of the program includes the use of “buzz words” in order to build a common language. For instance, instead of providing feedback by saying “make sure you are asking questions and letting the other person talk” the buzz phrase “remember to trade information” can be used. Success in the PEERS® program relies on a “formula of friendship” (access to peers + social skills + coaching = friendship). Didactic lessons from each week in the 14-week program are presented in Table 2.

Table 2:

PEERS® Didactic Topics

Session	Didactic Lesson
1	Introduction and Trading Information
2	Conversational Skills
3	Electronic Communication
4	Choosing Appropriate Friends
5	Appropriate Use of Humor
6	Peer Entry Strategies
7	Peer Exit Strategies
8	Get-togethers
9	Good Sportsmanship
10	Handling Teasing
11	Handling Bullying and Bad Reputations
12	Handling Arguments and Disagreements
13	Handling Rumors and Gossip
14	Graduation Party and Ceremony

It is important to note the role of neurodiversity in PEERS® and other interventions developed for use with people with ASD. Laugeson (2013) asserts that it is unethical to force social skills on anyone. Indeed, within a neurodiversity affirming framework, learning and practicing social skills is a personal choice. As such, social skills interventions are not meant to "change" people with ASD but can help them increase their social opportunities if they choose.

PEERS® curriculum has been researched extensively by both the program's developers and independent researchers (Laugeson et al., 2012; Laugeson et al., 2015; McVey et al., 2016). Along with adaptations for young adults and in educational settings, PEERS® has been linguistically and culturally adapted in over a dozen languages and has been used in over 85 countries (e.g., Platos et al., 2022; Idris et al., 2022; Sittanomai et al., 2021). Significant improvements in teens' social skills, social interactions, and an overall reduction of negative problems related to social deficits (e.g., anxiety, depression) have been consistently shown throughout the implementation of PEERS® (Laugeson et al., 2009; Laugeson et al., 2012, McVey et al., 2016).

Many standardized outcome measures have been used to examine the effectiveness of the PEERS® curriculum such as the Social Skills Rating System (SSRS; Gresham & Elliott, 1990), the Social Responsiveness Scale; Constantino, 2005), and the Empathy Quotient (EQ; Baron-Cohen & Wheelwright, 2004). Two measures were also developed specifically for use with the PEERS® intervention: The Test of Adolescent Social Skills Knowledge (TASSK; Laugeson & Frankel, 2010) which measures the concepts demonstrated in the PEERS® curriculum and the Quality of Socialization Questionnaire (QSQ; Laugeson & Frankel, 2010) which measures the frequency of get-togethers over the last month and the conflict that may have occurred at said get-togethers. The aforementioned tools have all found PEERS® to be effective in teaching social skills, decreasing social deficits, and increasing both the quality of friendships and the frequency of get-togethers with others (Laugeson & Frankel, 2010).

PEERS® is shown to be an effective tool to improve ecologically valid social skills. This is to say that the skills taught in PEERS® are generalizable to real-world skills and not unique to the treatment setting (Chang et al., 2022). The literature supports Laugeson et al's (2009) findings. Schohl et al., (2014) completed a replication of the PEERS® curriculum finding significantly increased knowledge and application of the concepts taught in PEERS® and a reduction of difficulties such as social anxiety.

Although Schohl et al., (2014) replicated the effectiveness of PEERS® in an area with a smaller population than the original study (approx. 600,000), there are still a great deal of areas with even smaller populations. Even when research shows the skills to be effective when taught to adolescents, to date, most of the research conducted with the group has been limited to urban and metropolitan areas (e.g., Los Angeles, Milwaukee). Due to the unique diagnostic and intervention disparities for autistic individuals in rural and non-metropolitan areas, it is important to investigate the PEERS® intervention and its effectiveness with individuals from rural and non-metropolitan locations.

Efficacy vs. Effectiveness

The difference between efficacy and effectiveness studies is often misunderstood and confused. Some researchers and clinicians do not comprehend the difference between the two types of studies, although differences exist in study design, patient populations, intervention design, data analysis, and result reporting (Singal et al., 2014). It is important to explore the differences between efficacy and effectiveness studies to determine under what circumstances each is appropriate for use.

In psychological practice, efficacy studies are focused on examining the performance of an intervention under ideal and controlled circumstances (Singal et al., 2014). As such, efficacy studies are often large sample randomized control trials (RCTs). Efficacy studies provide the best chance of observing the effect of an intervention, although they sacrifice some real-world applicability due to strict standardization of intervention implementation (Fritz & Cleland, 2003).

Although useful and necessary in the development of interventions, efficacy studies vary significantly from effectiveness studies. A table adapted from Singal et al., (2014) outlining the differences (Table 3) can be seen below.

Table 3

Efficacy and Effectiveness Studies

	Efficacy Study	**Effectiveness Study**
Question	Does the intervention work under ideal circumstance?	Does the intervention work in real-world practice?
Setting	Resource-intensive 'ideal setting'	Real-world everyday clinical setting
Study population	Highly selected, homogeneous population/Several exclusion criteria	Heterogeneous population/Few to no exclusion criteria
Providers	Highly experienced and trained	Representative usual providers
Intervention	Strictly enforced and standardized/No concurrent interventions	Applied with flexibility/Concurrent interventions and cross-over permitted

While efficacy studies focus on ideal settings, effectiveness studies examine the real-world utility of an intervention (Singal et al., 2014). Effectiveness studies generally include fewer participants and are less likely to be designed as RCTs. They instead focus on patient, provider, and system-level factors that are likely to impact the intervention (because these factors are likely to differ from "ideal") (Fritz & Cleland, 2003).

The goal of the current study was not to examine its efficaciousness or how well the PEERS® curriculum may work in an "ideal" setting. Rather, the study was designed to examine the PEERS® curriculum and its effectiveness in a real-world everyday setting with a population that has not been previously examined.

Evidence-Based Practice (EBP)

As the name suggests, “Evidence-Based” interventions are those with a strong foundation in research—generally in empirical studies (Forman et al., 2013). Evidence-Based Practice (EBP) can be thought of as a holistic approach to clinical work and research. As an iterative process, empirical evidence is used to support clinical decision making which in turn informs the direction of future avenues of research (Kratochwill, 2007).

The model of EBP focuses not only on implementing interventions based on the best available research evidence, but also takes into account contextual factors such as the needs and values of specific populations, available resources, and the expertise of the practitioner delivering the intervention (Satterfield et al., 2009).

Because the currently best available research evidence for the PEERS® curriculum does not include the population characteristics of individuals in rural and non-metropolitan areas, it is important to explore its effectiveness for individuals in such areas. In this way, the intervention in the current study was based on best available research evidence and can contribute to the existing body of literature as evidence of effectiveness for the population of interest.

Pilot Studies

The purpose of using pilot studies in research is twofold. Firstly, pilot studies can be used to assess the feasibility of a larger parent study with the same intervention methods. Secondly, pilot studies are used to assess whether an intervention is appropriate for use with certain populations (In, 2017; NIH, 2020). Pilot studies are useful in conjunction with EBP because they allow for the implementation of new strategies alongside the best practice for interventions. Pearson et al., (2020) developed a model for the use of pilot studies in the implementation of EBP. They asserted that by implementing new strategies based on pilot/feasibility studies can lead to improved implementation of evidence-based intervention. That is to say, pilot and feasibility studies help to ascertain refinements to interventions that can help them become more effective (Eldridge et al., 2016). As such, the use of pilot and feasibility studies can be used on existing interventions to assess their use in new settings or with new populations (Pearson et al., 2020).

With all research methodology, there are numerous pros and cons. A strength of feasibility and pilot studies is they have the ability to assess effectiveness across multiple levels. This is to say they can be looked at in a traditional broad sense as well as on an individual level (Aarons et al., 2011). Additionally, since the conditions under which pilot and feasibility studies are conducted are less controlled than conventional studies and are implemented by practitioners, they are often more pragmatic (Bowen et al., 2009). Since their sample sizes tend to be smaller than traditional studies, they can be used in an iterative manner to refine and optimize interventions over time (Hallingberg et al., 2018; Eccles et al., 2005).

Along with strengths associated with conducting pilot and feasibility studies, there are also some challenges and weaknesses that may arise. Due to small sample sizes, the goal of a pilot study can and should not be to provide results that are generalizable to a broad population (NIH, 2020). Although small sample sizes can be seen as a weakness of pilot and feasibility studies, it is best practice to use smaller samples. Experts suggest using around 10% of the overall parent study (Connelly, 2008; Hertzog, 2008). Thus, for intervention research where typical sample sizes are around 35 (Laugeson et al., 2009), a pilot/feasibility sample size of five can be considered sufficient.

Purpose of the Study

The current study was a pilot study examining the effectiveness of the PEERS® intervention in rural and non-metropolitan areas. Because there is little research focused on social skills interventions in rural and non-metropolitan areas, it is important to expand the existing body of literature. The present study involved five clinical participants and thus, any statistical analyses on group performance cannot be generalized beyond the group itself. Instead, trends in data and idiographic results can be used as justification for further study and overall appropriateness of use of the PEERS® intervention with autistic youth in rural and non-metropolitan areas (Becker, 2008). Data were collected from real-life clinical participants of a PEERS® program for clinical purposes and examined archivally for the current study.

Aims of the Study

The present study was designed to examine the effectiveness of the PEERS® curriculum with a group of participants from rural and non-metropolitan areas and develop recommendations for further research related to social skills intervention for this population. As PEERS® was developed in an urban setting, there may be differences in its effectiveness for participants in a rural or non-metropolitan area where resources and access to peers is more limited. By examining the individual results of a pilot cohort of rural and non-metropolitan PEERS® participants, justification for future research and implementation of the PEERS® intervention in rural and non-metropolitan areas can be made.

The current study aimed to determine the effectiveness of the PEERS® curriculum in a rural/non-metropolitan setting as guided by the following hypotheses aimed at examining knowledge of social skills, friendship quality, social deficits, and frequency of get-togethers with peers:

H1: Participants will have a broader understanding of social skills as measured by the Test of Adolescent Social Skills Knowledge (TASSK).

H2: Participants will have increased quality of friendships as measured by the Friendship Qualities Scale (FQS).

H3: Participants will display fewer social deficits as measured by the Social Responsiveness Scale (SRS-2).

H4: Participants will engage in more get-togethers with peers as measured by the Quality of Socialization Questionnaire (QSQ).

Method

Participants

Participants of the current study were adolescents who participated in a PEERS® group conducted at a privately-owned mental health practice in a nonmetropolitan location by the student clinician under the supervision of a certified PEERS® provider and licensed psychologist. The term “participants” was used in the current study to indicate individuals’ participation in the PEERS® intervention and not as participants in research. Any measure collected was done so for clinical purposes. Thus, this study was archival in nature based on real clinical data that have been deidentified prior to the study. Participants were five adolescents between the ages of 12 and 16 (m=14.2) with diagnoses of ASD who lived in rural and nonmetropolitan areas. Each participant received a diagnosis of ASD from a licensed healthcare professional or team prior to participation in the program, although the age of diagnosis was not recorded. Four participants were diagnosed with ASD level 1 and one with level 2, although levels of support were not considered to be exclusionary to the group given adequate cognitive and language abilities. ASD diagnosis was not reevaluated for participation in the PEERS®

program, however each participant reported continued social difficulty and a desire to learn and utilize social skills to make and keep friends. Each participant attended a different middle or high school. During the intervention, no participant missed more than three groups, with an average of one absence per participant. Participants did not know each other before beginning the group. Because of the clinical nature of the group, participants and their parents were able to receive services utilizing insurance. Billing was conducted separately for parent and adolescent groups.

Procedure

The PEERS® group was conducted from February to May of 2022. The group was run following the 14-week format outlined in the commercially available manual by Laugeson & Frankel, (2010). The group administrator, who conducted the adolescent groups was trained and certified prior to the intervention. The parent group leader was trained by the adolescent group leader and a licensed clinical psychologist who was also certified in PEERS®. Group behavioral coaches who assisted in behavioral management and demonstration of the skills taught were undergraduate students trained in behavioral management by PEERS® certified providers.

Following the PEERS® protocol, each session began with homework review from the previous week's lesson. Homework review was followed by a didactic lesson on specific social skills. Behavioral coaches and the group leader led role plays to demonstrate appropriate and inappropriate social skills related to the didactic lesson. Adolescents practiced the skills and were provided feedback from the group leader and behavioral coaches. Homework was assigned at the end of each lesson.

Concurrent social coaching sessions for caregivers followed a similar format to the adolescent group. Caregivers also participated in homework review from the previous week. The group leader provided feedback on coaching techniques and provided support for social coaches. The didactic was presented briefly and handouts were provided for reference.

Group participants, their parents, and their teachers were administered various measures (listed below) prior to beginning the group and at the conclusion of the group. These pre- and post-intervention measures were used in the data analysis to determine the effectiveness of the PEERS® intervention on this clinical population of autistic adolescents in a rural and non-metropolitan setting.

Measures

Test of Adolescent Social Skills Knowledge (TASSK)

The Test of Adolescent Social Skills Knowledge (TASSK) was developed as a clinical scale by the creators of PEERS® to assess the effectiveness of the PEERS® curriculum (Laugeson et al., 2010). The TASSK is made up of 30 items designed to assess participant's knowledge of social skills covered in the PEERS® curriculum. It is intended to be used pre- and post-intervention to examine the degree to which participants of a PEERS® group comprehended and retained information outlined during the PEERS® classes. The coefficient alpha for the TASSK was 0.56 but considered acceptable given the large scope of questions on the scale. Items from the TASSK can be seen in Appendix A. The TASSK is commonly used in clinical samples of PEERS® interventions to assess the knowledge of the skills taught in the program.

Friendship Qualities Scale (FQS)

The Friendship Qualities Scale (FQS; Bukowski et al., 1994) is used to assess teen's perception of the qualities of best friendship. The 23 items range from 1 (not true) to 5 (really true) and ask the teens to think about their best friends when answering (e.g., My friend and I spend all our free time together). The questions result in five subscales (Companionship, Closeness, Help, Security, and Conflict). Higher overall scores suggest better quality friendships. Bukowski et al (1994) found coefficient alphas for subscales to be 0.71 to 0.86 with confirmatory factor analysis supporting the subscales and discriminant validity between reciprocated and non-reciprocated friends being indicated in the scales.

In addition to use with teens diagnosed with ASD for the original validation of the PEERS® curriculum (Laugeson et al., 2009), the FQS has been used widely in friendship research, including several studies focused on ASD (e.g., Solomon et al., 2011; Chang et al., 2019). The FQS is presented in Appendix B. Much like the TASSK, the FQS is commonly used in clinical samples of PEERS® to assess friendship quality.

Quality of Socialization Questionnaire (QSQ)

The Quality of Socialization Questionnaire (QSQ) is a three-item measure used to identify both frequency of "get-togethers" and level of conflict during the get-togethers (Frankel & Mintz, 2008). The measure is administered to both teens (QSQ-A-R) and their parents (QSQ-P-R). Two items on both the parent and adolescent measures ask for an overall estimate in the number of hosted and invited get-togethers over the past month. Since get-togethers provide a much-needed venue for the practice of learned social skills (Laugeson et al., 2009) it is important to measure their frequency.

The third question on the measure reports on the level of conflict during any get-togethers the teen may have had over the previous month. The 12 questions within the third item were developed from the Quality of Play Questionnaire (QPQ; Frankel & Mintz, 2008) with items measuring peer conflict from both parent and adolescent perspectives (e.g., "criticized or teased each other"). The QPQ conflict scale had a coefficient alpha of 0.87 with a factor analysis of 175 boys and girls. The QSQ can be viewed in Appendix C. As one of the expected outcomes of PEERS® groups is increased get-togethers, the QSQ is commonly used in PEERS® groups as a clinical measure.

Social Responsiveness Scale (SRS-2)

Both parent and teacher reports of the Social Responsiveness Scale (SRS-2; Constantino, 2012) were completed for participants in the PEERS® group. The SRS-2 is a 65-item scale utilized to measure the level of common ASD symptoms as they are observed by each rater (parent and teacher) for children 4-18 years old. The SRS-2 results in a Total scaled score and six subscales: Social Awareness, Social Cognition, Social Communication, Social Motivation, Social Communication and Interaction and Restricted Interests & Repetitive Behavior. SRS-2 scores result in T-scores with a mean of 50 and SD of 15. Scores of 59 or below are considered within normal limits; 60-65 suggest mild social deficits; 66-75 suggest moderate social deficits; 76 or higher indicate severe deficits.

Psychometrically, the validity and reliability have been examined and found to be good for the SRS-2 with a specific test-retest reliability coefficient of 0.88 for the Total scaled score (Constantino, 2012). The SRS-2 is copyright restricted and thus cannot be included in the appendices for reference.

Results

Data Analysis

The measures administered in the current study were for clinical purposes. As such, the data obtained were archival in nature and not linked to participants of the PEERS® group. As deidentified data were not linked to participants of the PEERS® group in the current study, the Institutional Review Board (IRB) determined the current study did not meet requirements for human subjects research and IRB review was not required. As previously stated, the word "participants" in the results refers to participants of the PEERS® group intervention and not to indicate participation in an IRB-reviewed research protocol.

Lambert (2013) argues for the use of genuine clinical samples in the analysis of treatment effectiveness. This is to say, using actual patients in clinical outcome research is preferred to samples of individuals who are selected for various criteria. The analyses in this study were based on data from actual patients and not a highly selected sample. In order to assess positive changes in individuals who participated in the PEERS® curriculum, the Reliable Change Index (RCI) was used.

The RCI is used in clinical significance studies because it demonstrates when change in patients is clinically significant vs. statistically significant (Jacobson et al., 1984). Although statistical significance is useful, it can often be misleading. For instance, gains in scores may be interpreted as potent if they are statistically significant without showing significant clinical change (Lambert, 2013). This method of examining clinical change in patients is often used to measure the estimated value of an intervention for use with novel populations (Hansen et al., 2002).

Statistical analyses for the current study were conducted using the Statistical Package for the Social Sciences (SPSS v.28). Prior to analyses, data were cleaned and checked for missing data. The RCI was used to compare results of each measure pre- and post-intervention. Although significant group results were not possible with a sample size of n=5, individual results using the RCI can be anecdotal and supportive of further studies with the target population (Connelly, 2008).

The RCI is useful in measuring treatment effectiveness. If the PEERS® curriculum was effective, significant changes between the measures administered before the intervention and at the end of the intervention would be expected. These significant changes would be detected with the RCI comparing the participants scores on pre-intervention measures with their scores on the post-intervention measures (Reichardt, 2019).

The TASSK total sum score was used for hypothesis 1 (Participants will have a broader understanding of social skills). The total combined score from the FQS was used for hypothesis 2 (Participants will have increased quality of friendships). The Parent and Teacher SRS-2 Total scores was used for hypothesis 3 (Participants will display fewer social deficits). The Social Initiation and Social Reciprocity scales from the adolescent and parent forms in the QSQ was used for hypothesis 4 (Participants will engage in more get-togethers with peers).

Each result will be presented in table format, with each case displaying raw or converted scores, the difference between the pre- and post-test measurements, and the standardized difference. Standardized differences were calculated using the RCI formula with a confidence level of 95%. Therefore, reliable change would fall outside the range of -1.96 to 1.96 regardless of expected direction (Blampied, 2022).

Hypothesis 1: Social Skills

The first hypothesis was that participants will have a broader understanding of social skills as measured by the Test of Adolescent Social Skills Knowledge (TASSK). Results of the TASSK are reported below.

Table 4

TASSK Scores

Participant	TASSK Pre	TASSK Post	Post-Pre difference	Standardized difference	RC+/RC0/RC-
1	13	22	9	3.73	+
2	10	22	12	4.98	+
3	11	20	9	3.73	+
4	15	25	10	4.15	+
5	10	22	12	4.98	+

Hypothesis 1 was supported by the RCI. It was predicted that participants' understanding of the various social skills covered in the PEERS® curriculum would be improved. Each participant showed improvement in their understanding of social skills following implementation of the PEERS® curriculum. As previously stated, standardized differences of 1.96 or higher indicated clinically reliable change. Although the degree of change was not measured beyond the RCI, each participant demonstrated significant understanding of social skills measured by the TASSK total sum score.

Each participant filled out both the pre- and post-intervention forms for the TASSK with a mean score of 11.8 on the pre-test and a mean score of 22.2 on the post-test. Full results related to the TASSK and hypothesis 1 are outlined in table 4.

Hypothesis 2: Friendship Quality

The second hypothesis was that participants will have increased quality of friendships as measured by the Friendship Qualities Scale (FQS). Results of the FQS are reported below.

Table 5

FQS Scores

Participant	FQS Pre	FQS Post	Post-Pre difference	Standardized difference	RC+/RC0/RC-
1	18	19	1	.24	0
2	19	19	0	0	0
3	9	12	3	.70	0
4	17	15	-2	-.47	0
5	N/A	11	N/A	N/A (reported having no friends at start)	n/a

Hypothesis 2 was not supported. It was predicted that the overall quality of participants' friendships would improve as measured by the FQS. Although some participants showed modest improvement in the self-reported quality of their friendships, these improvements did not reach the threshold of the required RCI cutoff of 1.96. Likewise, one participant reported an insignificant decrease in their reported quality of friendships on the FQS, although this difference also missed the level of reliable change in the negative direction (-1.96). Overall, changes in either direction were minimal, with no significance.

Four of the five participants completed the pre- and post-intervention forms of the FQS. The participant who did not fill out the form reported having no friends at the start of the intervention as a reason for not completing the form. For the participants who completed the form, the average pre-test was 15.75 and the average post-test was 16.25. Full results related to hypothesis 2 and the corresponding RCI can be seen in table 5.

Hypothesis 3: Social Deficits

The third hypothesis was that **p**articipants will display fewer social deficits as measured by the Social Responsiveness Scale (SRS-2). The results of the SRS-2 can be seen below.

Table 6

SRS-2 Parent Scores

Participant	SRS-2 P Pre	SRS-2 P Post	Post-Pre difference	Standardized difference	RC+/RC0/RC-
1	87	80	-7	-1.42	0
2	75	74	-1	-.20	0
3	86	79	-7	-1.42	0
4	85	71	-14	-2.86	+
5	>/=90	83	-7	-1.43	0

Table 7

SRS-2 Teacher Scores

Participant	SRS-2 T Pre	SRS-2 T Post	Post-Pre difference	Standardized difference	RC+/RC0/RC-
1	81	89	8	1.63	0
2	n/a	>/=90	n/a	Missing	n/a
3	81	62	-19	-3.88	+
4	54	n/a	n/a	Missing	n/a
5	73	66	-7	-1.43	0

Tables 6 and 7 outline the results from hypothesis 3. The hypothesis that social deficits would be reduced was not supported. To reach the level of reliable change and support hypothesis 3, standardized difference scores would need to be less than -1.96 (or more than 1.96 to achieve reliable change in the unexpected direction). Although one parent and one teacher reported significant change on the SRS-2, most score differences did not achieve the level of reliable change. Despite this, all but one of the fully reported scores were in the expected direction.

Each parent completed both the pre- and post-intervention administration of the SRS-2. They reported a mean SRS-2 score of 84.6 on the pre-test and 77.4 on the post-test. One teacher did not fill out the pre-intervention administration and one did not fill out the post-intervention administration of the SRS-2. For the remaining cases, teachers reported a mean SRS-2 score of 72.25 on the pre-test and 76.75 on the post-test. Full results related to social deficits and the RCI as reported by parents and teachers on the SRS-2 can be seen in table 6 and table 7.

Hypothesis 4: Get-togethers

The final hypothesis was that participants will engage in more get-togethers with peers as measured by the Quality of Socialization Questionnaire (QSQ). The results of the QSQ are shown below.

Table 8

QSQ Self Report

Participant	QSQ A Pre	QSQ A Post	Pre-Post difference	Expected direction?
1	5	0	-5	No
2	6	0	-6	No
3	0	1	+1	Yes
4	5	8	+3	Yes
5	0	0	0	N/A

Table 9

QSQ Parent Report

Participant	QSQ P Pre	QSQ P Post	Pre-Post difference	Expected direction?
1	0	0	0	N/A
2	2	0	-2	No
3	1	3	+2	Yes
4	4	9	+5	Yes
5	1	2	+1	Yes

Hypothesis 4 could not be measured with the RCI. The original version of the QSQ was normed using the QPQ. Although a coefficient alpha was determined in the QPQ, the related items in the QSQ are focused on the quality of get togethers and not their overall frequency. Since hypothesis 4 is related to the quantity of get togethers, the questions related to frequency of get togethers will be used for analysis instead of an RCI. Overall, results related to hypothesis 4 were not fully supported. Although some participants and their parents reported an increase in the frequency of get togethers on the QSQ, results were not universal. Two teens and three parents reported an increase in get togethers, two teens and one parent reported a decrease in get togethers, and one teen and one parent reported no change in the overall frequency of get togethers. Full results related to the change in the frequency of get togethers as reported on the parent and self-report forms of the QSQ can be seen in tables 8 and 9.

In sum, the hypothesis that participants' knowledge of social skills following the PEERS® intervention was supported. The results related to friendship quality, social deficits, and frequency of get-togethers were mixed. Ultimately, although not all hypotheses were supported by the current study, discussion related to the results is warranted. Furthermore, with mixed findings, further research in the area of social skills intervention in rural and non-metropolitan areas is justified.

Discussion

The overall goal of the current study was to examine the clinical outcomes of the PEERS® intervention in rural and non-metropolitan areas to determine feasibility and effectiveness. Numerous studies have identified the effectiveness of PEERS® across cultures, languages, and with utility for teens and adults with a variety of social-emotional challenges. Ultimately, this archival pilot study can be used to evaluate the utility of future research with the PEERS® intervention in rural and non-metropolitan settings.

Participants in the PEERS® group used in the current study were all teenagers living in rural and non-metropolitan settings. While the measures the participants, their parents, and their teachers completed were not normed specifically for use with this population, each measure was normed including rural and non-metropolitan individuals in their samples. Because results were found to be significant in the original PEERS® intervention research (Laugeson et al., 2009) and the intervention in the current study was conducted using the PEERS® manual (Laugeson & Frankel, 2010), it is likely that the mixed findings were due in part to the non-metropolitan administration of the intervention. Discussion related to each hypothesis and its corresponding result can be found in the following sections.

Social Skills

The hypothesis that participants of the PEERS® intervention would have a broader understanding of social skills was supported. Each participant significantly improved in their ability to identify social skills. Thus, each participant demonstrated broader social skills when comparing pre-PEERS® to post-PEERS®. All-in-all, one of the primary objectives of PEERS® is to improve social skills so participants may utilize skills in real-life social situations. In this regard, even implemented in a rural/non-metropolitan setting, PEERS® seems to be effective.

The increase in measured social skills on the TASSK can be directly related to the curriculum that is included in the PEERS® intervention. This is to say that the questions asked in the TASSK form (Appendix A) measure knowledge related to skills taught in PEERS®. For example, one of the questions on the TASSK asks "When you're trying to join a group conversation, the FIRST thing you should do is:" and provides the options of either: "Watch and listen to observe the conversation" or "Make a comment about what they're saying." In PEERS® session 6 (PEER Entry Strategies), participants learn that although it IS important to do things such as making a comment when joining a conversation, it is important to first watch and listen to the conversation first (Laugeson & Frankel, 2010).

While it is clear that participants of the current study were able to retain information related to social skills from the PEERS® intervention, the current study does not measure the length of time this knowledge is retained by the participants. Likewise, participants were not made to demonstrate their knowledge and usage of acquired social skills beyond the completion of the TASSK. Despite this, there is ample evidence to demonstrate the longevity of social skills learned in PEERS® —some even suggesting that demonstrated social skills knowledge and usage may continue to increase even after the conclusion of the PEERS® intervention (e.g., White, et al., 2010).

The inclusion of parents as social coaches likely also contributed to the consistently increased scores on the TASSK. PEERS® is fairly unique in that it contains a social coaching component to help facilitate the skills. Although many programs focus on skills covered in PEERS® and measured by the TASSK, previous programs have not utilized the concurrent social coaching aspect (Ozonoff & Miller, 1995; Tse et al., 2007). Parental involvement and coaching outside the PEERS® session meeting times likely assisted in facilitating social skills (e.g., in vivo practice, individualized coaching).

Finally, the instruction methods present in the PEERS® intervention were likely contributors in the reported increase of knowledge related to specific social skills. Laugeson (2009) included various components related to cognitive behavior therapy (CBT) that assist teens in learning and practicing the skills during the PEERS® intervention. Specifically, the use of concrete rules for social situations as well as practice of skills during the session contributes to teens' knowledge of and comfortability with social skills. Another tool used in PEERS® is perspective taking questions, which help to broaden participants' understanding of social situations and how their behaviors may impact those they are socializing with.

In sum, the PEERS® intervention was successful at assisting participants in broadening their social skills understanding as evidenced by clinically reliable change between the pre-PEERS® and post-PEERS® measurements on the TASSK. The overall guiding question of the current study was to examine whether the PEERS® intervention could be feasible and effective. The reliable change from participants of the current study suggests that PEERS® can be implemented effectively in a rural location with regard to learning social skills taught in the program. Results from Laugeson's implementation of PEERS® (Laugeson et al., 2009) were similar with regards to the TASSK, indicating the intervention is likely effective in teaching social skills in both urban and rural settings.

Friendship Quality

The hypothesis that participants would have an increased quality of friendships (hypothesis 2) was not supported. Although some participants reported some modest increases in the overall quality of friendships from the pre-PEERS® to post-PEERS® administration of the FQS, they did not reach the level of reliable change as measured by the RCI. There are some factors that could contribute to results failing to reach the level of reliable change necessary to be considered significant.

The FQS measures friendship quality by tasking participants to think about their best friend and then asking specific questions related to the quality of that friendship. As can be seen in table 5, one participant did not complete the FQS because they could not identify a friend they could think about in order to complete the form and thus could not rate the quality of that friendship. Without access to similar-age peers considered to be friends, participants may struggle to accurately rate the quality of relationships.

As improvements in social skills and friendship quality are shown months after the PEERS® intervention (Laugeson et al., 2012), it is plausible to think participants in the current study may also show improvement on the FQS after some time. As participants are able to practice their social skills and make friends, results may improve significantly.

To summarize, although hypothesis 2 was not supported and participants did not demonstrate an increase in the quality of their friendships, there are factors that contribute. Specifically, a reported lack of current friendships and the relatively short time frame that the PEERS® intervention takes place are both valid reasons for why participants in the current study did not demonstrate reliable change in the overall quality of their friendships.

Social Deficits

The hypothesis that social deficits would be reduced was not supported. On the SRS-2, both parents and teachers were asked to complete pre-PEERS® and post-PEERS® ratings. Two teachers did not complete the post assessment and cannot be included in the findings. Regardless, only one parent and one teacher's ratings achieved the level of reliable change—suggesting that overall, participants did not demonstrate change reaching levels of clinical significance.

Results from the parent form of the SRS-2 (SRS-2 P) all demonstrated change that was in the expected direction. That is to say, after the implementation of the PEERS® program, participants had overall lower scores on the SRS-2—suggesting a reduction in overall social deficits noted by parents. The SRS-2 comprehensively measures symptoms related to ASD including both social communication differences as well as the presence of restricted interests and repetitive behaviors. Because PEERS® targets social skills specifically, it is unlikely that the presence of restricted interests and repetitive behaviors would be impacted by the intervention. Because the total score encompasses both social communication differences and restricted interests/repetitive behaviors, it is encouraging to see reduction of overall scores following the implementation of PEERS® —despite these differences not achieving the level of reliable change.

Despite most pre-PEERS® to post-PEERS® measurements of the SRS-2 not achieving reliable levels of change, many of the changes that were recorded were likely due to aspects of the PEERS® intervention. Specifically, the SRS-2 measures elements of social communication such as social awareness, social cognition, and social motivation (Constantino, 2012). PEERS® targets these areas specifically through various techniques. Social awareness and social cognition are targeted by the use of perspective-taking questions (e.g., "what could be the problem with policing others?" or "how might our friend feel if we tell inappropriate jokes?").

Social motivation is not specifically targeted by PEERS®. In order for teens to participate in the program, they must have the desire to learn the skills to make and keep friends. Social skills cannot be forced onto participants (Laugeson & Frankel, 2010). Rather, by learning and practicing the skills taught in PEERS®, participants likely have increased confidence in social interactions, which can then in turn increase "social motivation."

Overall, the social challenges of ASD may be somewhat improved in the current study, although the results did not achieve the level of reliable change measured by the SRS-2. It is worth noting that autism is a developmental disability and is not "treatable." Rather, social skills training may be useful with some autistic individuals to help with some of the social challenges that may be present.

Get-Togethers

The hypothesis that participants of the current study would have increased get-togethers was partially supported. Because an RCI could not be calculated for the QSQ, anecdotal evidence from both pre-PEERS® and post-PEERS® administrations of the parent rating form and the self-report form frequency measures was used. In the self-report form, teens reported mixed results, with some indicating an increase in get togethers while others noted a decrease or no change. Parents also reported mixed results, with some of their teens having an increased frequency of get togethers while one reported no change, and one reported a decrease.

Compared to the original study of the PEERS® intervention (Laugeson et al., 2009), the current study results varied most drastically in the QSQ. This difference is likely due to the rural nature of the current study. Participants are required to join social activities and host get togethers as part of the homework assigned in PEERS®. Since participants in rural areas have reduced access to such social activities or peers their age, completing these assignments may be much more difficult for them. Throughout the program, participants struggled to find appropriate sources of friends based on their interests and required additional support in order to be successful.

Another factor that may have contributed to the lack of significant results related to increased get togethers is social awareness brought about through the PEERS® curriculum. As discussed in hypothesis 3 and measured by the SRS-2, participants likely had increased social awareness and motivation following their participation in the PEERS® program. Without a firm understanding of get togethers preceding the program, it is possible that participants may not have fully comprehended what constituted a get together. Following the program, participants may have been more aware of their reduced social interaction with peers and reported it on the QSQ.

In sum, the rural nature of the current study implementation likely impacted the ability of participants to engage socially with peers as evidenced by the QSQ. As previously mentioned, it is possible that additional time may increase the chances that individuals in the current study have get-togethers, however it is uncertain given the nature of the current study. Confounds in understanding of the term "get-togethers" before and after the implementation of the PEERS® program is also possible and should be addressed in future research and implementations of the curriculum.

Limitations

Although the overall quandary of whether the PEERS® social skills curriculum would be effective and feasible was generally supported, there are some significant limitations to the current study. Additionally, due to the results and limitations of the current study, further directed research in the area of social skills intervention implementation in rural and non-metropolitan areas is warranted. Limitations of the current study will be discussed before leading to possible future research directions and conclusions.

Sample Size

One notable limitation of the current study is the small sample size. With only five participants, it is unlikely that the results of the current study can be generalized to broader populations. As such, caution should be exercised when viewing the results and should not be used as unwavering evidence. Rather, the results of the current study are supportive of future research in the area of rural implementation of interventions—specifically the PEERS® intervention for autistic teens.

As mentioned, the aim of the current study was not to fully indicate whether or not the PEERS® intervention is useful and adequate in a rural setting, but rather to use a real-world clinical application of PEERS® in a rural setting as evidence of utility and for support toward future research with this population.

Sample Characteristics

Another limitation of the current study is the overall sample characteristics. Although definitions of "rural" and "non-metropolitan" vary (e.g., Ratcliffe et al., 2016; Mar, 2010), most definitions rely on population size or density. While these definitions can be useful in many regards, overall, they do not capture the diversity that is present in various rural areas across the United States and beyond. The sample obtained in the current study was limited to one rural geographic region. As such, the results of the current study are not representative of *every* rural region.

It is not possible to fully encapsulate the experience of every rural and non-metropolitan region in order to assess the effectiveness of PEERS® or other interventions, however, efforts can be made to include a variety of regions to better understand variances that may occur throughout the variety of experiences rural and non-metropolitan populations.

Study Design

The current study was designed to be as close to the original validation of the PEERS® intervention as possible in the sense that real-world clinical data were used from an administration of the manualized PEERS® (Laugeson & Frankel, 2010). While there are many strengths of that study and the current study, both are cross-sectional in nature. Because the current study measured outcomes pre- and post-PEERS®, data on the effectiveness of the intervention was obtainable. It is unclear based on the current findings whether participants in rural areas will make further gains following the program or whether knowledge and utilization of social skills will be retained months or years following the end of the program.

Evidence of the current study supports the use of PEERS® in rural areas, however further information is needed to better infer causality of results. Because the current study was designed to be similar to previous research related to PEERS® (e.g., Laugeson et al., 2009), it is likely that results are similar further from the end of the curriculum as evidenced by previous PEERS® research (e.g., Laugeson et al., 2012).

Future Directions

While there were some limitations evident in the current study, these limitations can pave the way for additional research directions for those interested in clinical interventions in rural and non-metropolitan areas. Broadly, such research should be focused on more firmly testing the effectiveness of interventions and tailoring them for specific use in rural and non-metropolitan areas.

The next natural progression in the current line of research would be to increase the sample size. Because the current study was exploratory and designed to be a pilot study, it is important for future research to extend the implementation of the intervention so generalizability of results can be obtained. Increasing the sample size will decrease the odds that results obtained following the intervention would be confounded by outside factors. Additionally, statistical analyses could be run to supplement the clinically reliable changes that were obtained in the current study. Scientific publications are also more likely to accept findings that are statistically reliable in addition to clinically reliable.

Another benefit of increasing sample size is to explore the diversity of experiences of rural and non-metropolitan areas. PEERS® has been adapted for cultures throughout the world and in several languages. It is a natural progression of the program to continue adaptations for specific populations. Because rural individuals are not a cohesive population, a set of guidelines may be more beneficial than an overall adaptation. For instance, the Midwest is home to 36 recognized tribal nations—all with its own culture and customs. In a similar fashion, learning about the social customs of rural locations and working with individual clinicians to best implement PEERS® and related social skills interventions may be a valid approach.

Due to of the unique cultural views of autism, it is important to consult with researchers, clinicians, and community stakeholders from distinct cultures. Likewise, “social skills” are somewhat culturally normed, so adaptations must be tailored to specific areas and demographics. As such, it is likely not feasible to fully research and adapt the PEERS® intervention for each culture. Rather, clinicians can use the intervention and individually tailor it to the needs of the population they work with. For instance, many indigenous people may not utilize eye contact as sign of attention. Clinicians and/or researchers working with tribal nations may wish to focus on alternative methods of showing attention (e.g., facing someone, nodding, repeating what someone says). Many other adaptations are likely necessary for individual communities and populations, and should be considered and researched by experts of the culture (i.e., tribal members for Native American populations).

In addition to quantitative research, future research directions should include qualitative components. Focus groups with individuals from the community would help bolster the adaptations to be more culturally relevant for novel populations. Likewise, qualitative interviews with former participants and their families could be a method to obtain rich evidence of the experiences garnered from participation in PEERS®.

Once generalizable findings are obtained from a larger rural and non-metropolitan sample, focused research can explore the long-term effects of PEERS®. Follow up studies are common in intervention research and measure the robustness of findings over time. A study utilizing identical outcome measures from the current study could be implemented six months following an initial implementation of PEERS®. Since it is possible for individuals to show increased benefits and continued success in social skills knowledge and utilization months or years after participating in the intervention (Laugeson et al., 2012), the same should be researched following rural implementation.

Summary and Conclusions

The overall aim of the current pilot study was to explore the effectiveness and feasibility of the PEERS® intervention in a rural/non-metropolitan setting. Because the original PEERS® intervention was implemented in a metropolitan setting, it is important to broaden the scope of the intervention. The current study was meant to be anecdotal support for future research into rural and non-metropolitan implementation of the intervention.

When returning to the questions “is PEERS® effective and feasible in a rural or non-metropolitan setting?” the evidence does support the need for future research. Although evidence was mixed in questions related to friendship quality, ASD symptoms, and the amount of social interaction measured by get-togethers, the current study did find strong evidence that the participants of PEERS® significantly increased their knowledge of social skills.

Research on this topic is important as individuals living outside of major metropolitan hubs are often excluded or underrepresented from research studies and normed samples. Additionally, the importance of social skills for positive mental health outcomes is evident in the literature, and the inclusion of neurodiverse teens from rural and non-metropolitan areas is necessary to truly provide inclusive services for all.

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Appendix A

Test of Adolescent Social Skills Knowledge
(TASSK)

Instructions:

The following items are about making and keeping friends. After you read each item, there will be a couple choices to choose from. Decide which choice is the best by bubbling in the best answer. Only choose one answer per item.

1. The most important part of having a conversation is to:
    Trade information
    Make sure the other person is laughing and smiling

2. The goal of a conversation is to:
    Make the other person like you
    Find common interests

3. One of the rules for having a two way conversation is to:
    Be an interviewer
    Don't be an interviewer

4. When you are FIRST getting to know someone, it is important to be:
    Funny and silly
    A little more serious at first

5. When you're calling a friend on the telephone, it is important to:
    Tell them your first and last name and where you go to school
    Have a cover story for calling

6. When you're calling a peer on the telephone:
    Avoid cold calling
    Let them do most of the talking

7. It's ALWAYS a good idea to try to make friends with someone who:
    Is more popular than you
    Likes the same things as you

8. It's a good idea to have a social group because:
    You're more likely to be popular
    It protects you from bullying

9. After you make a joke, it's a good idea to pay attention to:
    Whether the other person is laughing
    Your humor feedback

10. It is ALWAYS a good sign if someone laughs at your jokes:
    True
    False

11. When starting an individual conversation:
    Wait for the person to notice you
    Find a common interest

12. When you're trying to join a group conversation, the FIRST thing you should do is:
    Watch and listen to observe the conversation
    Make a comment about what they're saying

13. If you try to join a conversation and the people exclude you:
    Give a cover story
    Make sure they can hear you

14. If you try to join ten different conversations, on average how many times out of ten are you likely to be rejected:
    7 out of 10
    5 out of 10

15. Teens like to play sports with other teens who:
    Score points and play well
    Praise them

16. When people aren't playing by the rules:
    Nicely remind them what the rules are
    Don't referee them

17. When having a friend over for a get-together at your home:
    Tell your friend what you're going to do
    Have your friend choose the activity

18. If you're having a friend over for a get-together and someone else unexpectedly calls that you really like:
    Invite your other friend over
    Tell them that you're busy and will call them later

19. The FIRST thing you should do when you get into an argument with a friend is:
    Listen and keep your cool
    Explain your side

20. When a friend accuses you of doing something you didn't do:
    Say you're sorry that this happened

Explain your side until they believe you

21. If you are trying to change your reputation at school, the FIRST thing you should do is

Join an extracurricular activity at school
Lay low for a while

22. Which of the following is an important step for changing a reputation:

Change your look
Make sure that people get to know you better

23. If another kid teases you or calls you a name:

Give a teasing comeback
Tell an adult

24. When someone teases you, the best thing to do is:

Ignore them and walk away
Act like what they said didn't bother you

25. If someone keeps pushing you in the hallway as you pass their locker:

Gently push them back
Lay low when the bully is around

26 If someone is physically bullying you, the FIRST thing you should do is:

Get help from an adult
.. Avoid the bully

27. If someone is bullying you online, the FIRST thing you should do is:

Report the cyber bullying to the proper authorities
Have a friend stick up for you

28. If someone is cyber bullying you, it's a good idea to defend yourself and fight back:

True
False

29. If someone spreads a rumor about you that isn't true, you should:

Confront the person that started the rumor
Spread the rumor about yourself

30. If someone is gossiping behind your back, you should:

Let them know that the gossip hurts your feelings
Act amazed that anyone would believe the gossip

Appendix B

Friendship Qualities Scale (FQS)

Think about your friendship with your best friend. For each item, please circle the number that describes how true the sentence is about your friendship.

1. My friend and I spend all our free time together.

1	2	3	4	5
Not true	A little true	Somewhat true	Mostly true	Really true

2. I can get into fights with my friend.

1	2	3	4	5
Not true	A little true	Somewhat true	Mostly true	Really true

3. If I forgot my lunch or needed a little money, my friend would loan it to me.

1	2	3	4	5
Not true	A little true	Somewhat true	Mostly true	Really true

4. If I have a problem at school or at home, I can talk to my friend about it.

1	2	3	4	5
Not true	A little true	Somewhat true	Mostly true	Really true

5. If my friend had to move away, I would miss him/her.

1	2	3	4	5
Not true	A little true	Somewhat true	Mostly true	Really true

6. My friend thinks of fun things for us to do together.

1	2	3	4	5
Not true	A little true	Somewhat true	Mostly true	Really true

7. My friend can bug me or annoy me even though I ask him/her not to.

1	2	3	4	5
Not true	A little true	Somewhat true	Mostly true	Really true

8. My friend helps me when I am having trouble with something.

1	2	3	4	5
Not true	A little true	Somewhat true	Mostly true	Really true

9. If there is something bothering me, I can tell my friend about it even if it is something I cannot tell to other people.

1	2	3	4	5
Not true	A little true	Somewhat true	Mostly true	Really true

10. I feel happy when I am with my friend.

1 2 3 4 5
Not true A little true Somewhat true Mostly true Really true

11. My friend and I go to each other's houses after school and on weekends.
1 2 3 4 5
Not true A little true Somewhat true Mostly true Really true

12. My friend and I can argue a lot.
1 2 3 4 5
Not true A little true Somewhat true Mostly true Really true

13. My friend would help me if I needed it.
1 2 3 4 5
Not true A little true Somewhat true Mostly true Really true

14. If I said I was sorry after I had a fight with my friend, he/she would still stay mad at me.
1 2 3 4 5
Not true A little true Somewhat true Mostly true Really true

15. I think about my friend even when my friend is not around.
1 2 3 4 5
Not true A little true Somewhat true Mostly true Really true

16. Sometimes my friend and I just sit around and talk about things like school, sports, and things we like.
1 2 3 4 5
Not true A little true Somewhat true Mostly true Really true

17. My friend and I disagree about many things.
1 2 3 4 5
Not true A little true Somewhat true Mostly true Really true

18. If other kids were bothering me, my friend would help me.
1 2 3 4 5
Not true A little true Somewhat true Mostly true Really true

19. If my friend or I do something that bothers the other one of us, we can make up easily.
1 2 3 4 5
Not true A little true Somewhat true Mostly true Really true

20. When I do a good job at something, my friend is happy for me.
1 2 3 4 5
Not true A little true Somewhat true Mostly true Really true

21. My friend would stick up for me if another kid was causing me trouble.
1 2 3 4 5

Not true A little true Somewhat true Mostly true Really true

22. If my friend and I have a fight or argument, we can say “I’m sorry” and everything will be alright.
1 2 3 4 5
Not true A little true Somewhat true Mostly true Really true

23. Sometimes my friend does things for me, or makes me feel special.
1 2 3 4 5
Not true A little true Somewhat true Mostly true Really true

Appendix C

Quality of Socialization Questionnaire (QSQ)

We are interested in get-togethers that you had in the last month. A get-together is any time that teens follow through with a commitment to meet together after agreeing on a place and time.

- It may be a planned activity, such as bowling or at the video arcade or just to "hang out".
- It may be organized well in advance or spontaneously for later the same day.
- It may be with one other teen or a group of teens.

1. **How many get-togethers did you organize in the last month? - ______________________**

Please list the **first names** of all the friends who came to your get-togethers **in the past month.** If you did not organize a get-together with another teen or other teens in the past month, leave the section below blank.

Friend's first name______________________ Friend's first name________________________
Friend's first name______________________ Friend's first name________________________
Friend's first name______________________ Friend's first name________________________
Friend's first name______________________ Friend's first name________________________

2. **How did you and your friends get along in the last get-together?**

Circle the number below that describes how true each sentence is.

	Not at all true	*Just a little true*	*Pretty much true*	*Very much true*
We didn't share games, personal items, etc.	0	1	2	3
We got along well	3	2	1	0
We got upset at each other	0	1	2	3
We had fun	3	2	1	0
We argued with each other	0	1	2	3
We enjoyed each other	3	2	1	0
We criticized or teased each other	0	1	2	3
We shared conversation	3	2	1	0
We were bossy with each other	0	1	2	3

We needed a parent to solve problems	0	1	2	3
We withdrew from each other	0	1	2	3
We annoyed each other	0	1	2	3

3. **To how many get-togethers were you invited to by other teens in the past month?____________**

Fill in the **first names** of your friends who invited you to the get-togethers. If you were not invited to a get-together in the past month, leave the section below blank.

Friend’s first name______________________ Friend’s first name________________________
Friend’s first name______________________ Friend’s first name________________________
Friend’s first name______________________ Friend’s first name________________________
Friend’s first name______________________ Friend’s first name________________________