

Research Article

Assessment of Peer Victimization and Mental Disorders Among Siblings of Individuals with Autism Spectrum Disorders

Oren Shtayermman*

Department of Sociology, Anthropology & Social Work, Eastern Connecticut State University, CT, USA

***Corresponding author:** Oren Shtayermman, Department of Sociology, Anthropology & Social Work, Eastern Connecticut State University, CT, USA. Tel: +18604651229; Email: shtayermmano@easternct.edu

Citation: Shtayermman O (2018) Assessment of Peer Victimization and Mental Disorders Among Siblings of Individuals with Autism Spectrum Disorders. Int J Autism & Relat Disabil: IJARD-107. DOI: 10.29011/IJARD-107. 000007

Received Date: 13 July, 2018; **Accepted Date:** 14 August, 2018; **Published Date:** 23 August, 2018

Abstract

The purpose of this study was to investigate the presence of peer victimization, mood disorders (Major Depressive Disorder, Dysthymic Disorder) and anxiety disorder (Generalized Anxiety Disorder) among siblings of individuals diagnosed with Autism Spectrum Disorders (ASD). A web based survey was used to collect data on siblings of individuals on the spectrum. A sample of 10 females was finalized for the purpose of analyses. The mean age of the participants was 25.9 years (SD=9.21). The sample of 10 suggested a high proportion of respondents with scores above the cutoff point on the overt victimization and relational victimization scales suggest that siblings experienced high levels of victimization. From the sample, 70% met the diagnostic criteria for Major Depressive Disorder. In addition, 40% of the sample met the diagnostic criteria for Generalized Anxiety Disorder. Siblings reported high levels of support from family. Discussion related to future research, assessment and treatment are presented.

Keywords: Autism; Autism Spectrum Disorders (ASD); Mental Health; Peer Victimization; Siblings

Introduction

Autism Spectrum Disorder (ASD) rates have steadily increased in the past decade. It is estimated that 1 out of 68 children are identified with autism, incidence that has increased meaningfully in the last decade [1] (CDD, 2014). The symptoms of ASD vary from mild to severe in individuals diagnosed with the disorder. Individuals diagnosed with ASD, display enduring neurodevelopment deficiencies that affect conduct, social communications, and the encumbrance caring for them is especially heavy when the child is presenting with emotional, behavioral and communication problems or include other comorbid issues [2] that may influence day-to-day functioning and independence [3]. The developmental challenges that individuals on the spectrum are faced will cause them to rely heavily on the support of their relatives, especially their parents [4]. Many individuals with ASDs have distinctive features that might impact family members, including parents, siblings, and extended family members [5]. According to [6] research related to ASD and the impact the diagnosis has on family members focused primarily on parents as

the sub-unit within the family and very little attention was provided to the cognitive, behavioral and emotional impact the diagnosis of autism has on siblings of individuals on the spectrum.

Stigma and Peer Victimization

Investigation of relatives of individuals diagnosed with disabilities suggested that the families of these individuals' experience "Courtesy Stigma" [7]. In this process, member of the family experience stigmatization because of their relationship with the stigmatized person rather than through their individual characteristics [7].

Mor and Berkson [8] suggested that individuals develop impressions of others who are influenced by the bodily features and nonverbal behaviors of others around them. Furthermore, people frequently use movement signals of others when making impressions of others, and an individual's reactions and perceptions to physical cues serves as a foundation for the construction of stereotypes and for social interactions [8]. Individuals diagnosed with ASD may present with body rocking which is one of the more common repetitive behaviors. Mor and Berkson [8] noted that people make more undesirable trait inferences about people who engage in body rocking than they do about individuals who do not

act in that manner. Current data indicate that bullying and peer victimization are associated with severe emotional and behavioral problems [9]. Victimization exists when individuals are exposed frequently to a harmful action by others [10]. Individuals who were victimized by their peers were more vulnerable to developing psychological symptoms of depression and anxiety [9]. Although there is a large body of literature on bullies and victims, there is no current published data that investigated peer victimization among siblings of individuals on the ASD. The aims of the following study was to examine levels of peer victimization, presence of mood disorder and the presence of anxiety disorder in a sample of siblings of individuals diagnosed with ASD.

Siblings of Individuals on the ASD

Orsmond and Seltzer [11] indicated that adults who have a sibling on the ASD may be responsible for the wellbeing of their sibling once their parents are unable to care for them. Parents of individuals on the spectrum are exposed to high levels of stress and presenting with lower levels of marital satisfaction [12]. Throughout their lives, siblings of individuals on the spectrum may be exposed to various conditions within their environment which increase their vulnerability to develop mental health issues [6]. Much of the current and available literature on siblings of individuals diagnosed with ASD or siblings of individuals with other disabilities presented with inconsistent and inconclusive findings in the area [13]. In review of the literature in the area of ASD impact on siblings' mental health it is suggested that growing up with a sibling with disability can have an impact on social and emotional adjustment of family members [14]. (Table 1) summarize the majority of these findings. In relation to social competence and

peer relationship it was noted that there are is no agreement on how ASD influence the abovementioned domains in the lives of siblings [15]. Overall, there is no sufficient data to support the notion that siblings of individuals on the spectrum are at higher risk for developing any mental health issues. Nevertheless, there is some evidence suggesting that females of siblings with autism are at greater risk for developing anxiety related disorders. Anxiety related disorders are the most common in childhood and can contribute to changes in academic performance as well as cognitive and social development [16]. There are several methodological challenges discussed in the literature on siblings of individuals diagnosed with ASD. The first is related to life stages of the siblings [17]. The life stage is associated with a developmental stage. Individuals who are in childhood will respond differently to the presence of a sibling with ASD compared with an adolescent. Hankin, [18] noted that depression rises dramatically during adolescence and that the 1-year prevalence rates of clinical depression increase from 3% to 18% between the ages of 15 and 18 years, and 25 to 40% of adolescents report having a depressed mood. The second issue is related to differences in participants' demographics [13]. The demographic factors include family size and sibling age. The third matter that presented challenges in obtaining accurate data on siblings of individuals on the spectrum is connected to specific methodological issues [6]. Small samples, non-probability and convenience samples have contributed to the limited ability to generalize the findings. Variance in the standardized measures and tools used in the research may also contribute to variations in the results available. The abovementioned challenges offer an opportunity to continue the investigation of the impact the diagnosis of ASD has on siblings.

Citation	Methods	Results	Comments
Yirmiya et al., 2006 [19]	<p>Study Design: Cross - Sectional</p> <p>Sample:</p> <ul style="list-style-type: none"> • Thirty SIBS-A • Thirtyone SIBS-TD <p>Measures:</p> <ul style="list-style-type: none"> • Twenty one dyads of mothers and their 4 month old infants. • Bayley Scales of Infant Development - 2nd Edition • Infant Characteristics Questionnaire (ICQ) • Synchrony was measured with use of the mother-infant free play interaction. <ul style="list-style-type: none"> • Still-face paradigm. <ul style="list-style-type: none"> • SIB-A (sibling with autism) • SIB-TD (sibling with typical development) 	<ul style="list-style-type: none"> • SIBS-A were functioning just as well as SIBS-TD from 4 to 14 months of age. • SIBS-A scored lower on Bayley Scale. • Six SIBS-A presented a language delay of five months. 	<ul style="list-style-type: none"> • This study focused on the genetic liability of the phenotypes of autism, and the influence of autistic children having siblings with autism.

<p>Kaminsky and Dewey, 2001[20]</p>	<p>Study Design: Cross - Sectional Measures:</p> <ul style="list-style-type: none"> • Ninety children and adolescents between the ages of eight and eighteen utilized. • Sibling Relationship Questionnaire - Revised (SRQ). • The Gilliam Autism Rating Scale (GARS) <ul style="list-style-type: none"> • Adaptive Behavior Questionnaire • Demographics Questionnaire 	<ul style="list-style-type: none"> • Sibling participants of siblings with autism reported less intimacy. • Also reported less nurturance. • Siblings reported lower levels of prosocial behavior in their sibling relationships. 	<p>Limitations:</p> <ul style="list-style-type: none"> • Limited studies have investigated siblings' perceptions of their relationship that was present with their siblings with autism.
<p>Hastings, 2003 [21]</p>	<p>Study Design: Cross - Sectional Sample:</p> <ul style="list-style-type: none"> • Seventy eight siblings of children with autism on ABA programs. <p>Measures:</p> <ul style="list-style-type: none"> • Autism Behavior Checklist (ABC) • ABC utilized to determine the level of autistic symptomatology. <ul style="list-style-type: none"> • Family Support Scale (FSS). • Sibling Behavioral Adjustment measured with the use of the Strengths and Difficulties Questionnaire (SDQ). • Sample derived of children with autism participating in Applied Behavioral Analysis Programs (ABA) 	<ul style="list-style-type: none"> • SDQ in hand with the ABA intervention programs show no effect on sibling adjustment. • It would not be appropriate to make assumptions that siblings in certain circumstances are adjusted more so than children other circumstances 	<p>Limitations:</p> <ul style="list-style-type: none"> • Most individuals utilized for research have been high in socioeconomic status. • Future research should interpret early interventions that may be more beneficial for the families.
<p>Rossiter et al., 2001 [22]</p>	<p>Study Design: Meta-analysis Sample:</p> <ul style="list-style-type: none"> • Twenty-five studies • Seventy-nine effect sizes <p>Measures:</p> <ul style="list-style-type: none"> • Twenty-five published studies utilized that were published from 1972-1999. • Data bases PSYC-LIT and ERIC were utilized. • Studies evaluated on methodological quality. • Studies that were evaluated were not excluded if inadequate, but utilized for informational. 	<ul style="list-style-type: none"> • Meta-analytic research found a significant but small effect for having a sibling with mental retardation on a typically functioning sibling. • All studies utilized were peer-reviewed articles to assure adequate information. 	<p>Limitations:</p> <ul style="list-style-type: none"> • Meta-analysis is limited due to the limited number and quality of associated studies. • Cannot establish if there are relationships between adjustment problems and having a sibling with mental retardation.
<p>Pilowsky et al., 2007 [23]</p>	<p>Study Design: Cross - Sectional Sample:</p> <ul style="list-style-type: none"> • Thirty siblings of children with AU-S • Twenty-eight siblings of children with MR • Thirty siblings of children with DLD-S <p>Measures:</p> <ul style="list-style-type: none"> • Wechsler Intelligence Scale for Children - 3rd Edition (WISC-III). • Wide Range Achievement Test - 3rd Edition (WRAT-III). <ul style="list-style-type: none"> • Executive Functions Utilized: <ul style="list-style-type: none"> • Tower of Hanoi • Word association test • Rapid Automatic Naming test • Visual Perception Test (VPT). <ul style="list-style-type: none"> • Sequences Test • Child Behavior Checklist (CBCL). 	<ul style="list-style-type: none"> • Significant finding comprised of the lack of neuropsychological functioning difficulties of specific to AU-S. <ul style="list-style-type: none"> • Autism group - siblings' distractibility was associated negatively with probands' adaptive behavior level. • Findings consistent with previous research. 	<p>Limitations:</p> <ul style="list-style-type: none"> • Small sample size. • Lack of a control group of typically developing siblings. • Research should be mandated to younger siblings.

<p>Kohler, 1999 [24]</p>	<p>Study Design: Cross - Sectional Sample:</p> <ul style="list-style-type: none"> • Twenty-five families of children with autism or PDD. <p>Measures:</p> <ul style="list-style-type: none"> • Parents asked to identify that type of services their children received over a period of 6 months. • Families provided information about the accessibility of the services they have received over the 6 month period. • Parents asked a series of five questions. • Parents were asked about the methods each service provided used to see if there was a link around the needs of a their children. 	<ul style="list-style-type: none"> • Families of children with PDD or autism have needs that much be fulfilled by a large amount of services. • Families did meet with a variety of services. 	<p>Limitations:</p> <ul style="list-style-type: none"> • Small sample size of participants (n= 25). • Future research should evaluate the best interventions with the best outcomes from children with disabilities and their families.
<p>Presmanes et al., 2007 [25]</p>	<p>Study Design: Cross - Sectional Sample:</p> <ul style="list-style-type: none"> • Forty-six SIBS-ASD • Thirty-five SIBS TD <p>Measures:</p> <ul style="list-style-type: none"> • Responding to Joint Attention (RJA). • Mullen Scales of Early Learning (MSEL). • Screening Tool for Autism in 2-year-olds (STAT). 	<ul style="list-style-type: none"> • Siblings with Autism had significantly lower RJA scores than siblings of typical development. 	<ul style="list-style-type: none"> • Future research should include a longitudinal analysis of the RJA.
<p>Goin-Kochel et al., 2007 [26]</p>	<p>Study Design: Cross - Sectional Sample:</p> <ul style="list-style-type: none"> • PPVT - n = 204 families • Ravens - n = 226 families • VABS - n = 348 families <p>Measures:</p> <ul style="list-style-type: none"> • Data received from multiplex families participating in the Autism Genetic Resource Exchange. • Peabody Picture Vocabulary Test - Third Edition (PPVT - III). • Ravens Colored Progressive Matrices • Vineland Adaptive Behavior Scales (VABS) 	<p>ICCs were only slightly higher for autism-only siblings versus those with autism spectrum disorder.</p> <ul style="list-style-type: none"> • Siblings with ASD and autism are more similar on measures of verbal and nonverbal IQ than are affected non-siblings. 	<p>Limitations:</p> <ul style="list-style-type: none"> • Cognitive gains are less pronounced than adaptive-behavior gains. • Treatment effects could have affected the VABS scores. • AGRE data did not contain knowledge of the children's therapies.
<p>Rivers et al., 2008 [27]</p>	<p>Study Design: Cross - Sectional Sample:</p> <ul style="list-style-type: none"> • Fifty children with ASD and their typically developing siblings. <p>Measures:</p> <ul style="list-style-type: none"> • Sibling relationship measured by 28-item Sibling Inventory of Behavior (SIB) and the Satisfaction with the Sibling Relationship Scale. • Temperament was measured utilizing the TAB-R and the SATI. • Two items utilized from the Satisfaction with Sibling Relationship Scale to assess sibling satisfaction with parental differential treatment. 	<ul style="list-style-type: none"> • Persistence was an important predictor of quality relationships between typically developing siblings and children with autism. • Temperament buffering was found to occur when one sibling has a difficult temperament and the other does not. • High persistence allows negotiation of spending mutually pleasing time with SIB-ASD. 	<ul style="list-style-type: none"> • Study was strong because it analyzed the parents' and siblings' perspectives on the sibling relationship. <p>Limitations:</p> <ul style="list-style-type: none"> • Findings involving the temperaments of children with ASD were less significant than the temperaments of their siblings

<p>Gamliel et al., 2007 [28]</p>	<p>Study Design: Cross - Sectional Sample:</p> <ul style="list-style-type: none"> • Thirty-nine SIBS-A • Thirty-nine SIBS-TD <p>Measures:</p> <ul style="list-style-type: none"> • Bayley Scales of Infant Development - 2nd Edition (BSID -II). • Reynell Developmental Language Scales (RDLS). • Kaufman Assessment Battery for Children (K-ABC). <ul style="list-style-type: none"> • Clinical Evaluation of Language Fundamentals - Preschool (CELF -preschool). • Survey of Clinical and/or Educational Services. 	<ul style="list-style-type: none"> • Most participants of the group SIBS-A developed well in terms of language and cognition. • Findings of similarities and differences between SIBS-A and SIBS-TD were similar to findings for older siblings. 	<p>Limitations:</p> <ul style="list-style-type: none"> • Relatively low sample size for the group SIBS-A. • Unknown if larger groups of SIBS-A would replicate the data that was received from this study. <ul style="list-style-type: none"> • Ethical issues must be taken into consideration, because participants who were experiencing language delays at 14 months were functioning fine at 54 months.
<p>Hastings, 2003 [29]</p>	<p>Study Design: Cross - Sectional Sample:</p> <ul style="list-style-type: none"> • Twenty-two siblings of children with autism <p>Measures:</p> <ul style="list-style-type: none"> • Teacher Report version of the Developmental Behavior Checklist. • Friedrich Short Form of the QRS. • Strengths and Difficulties Questionnaire was utilized for mothers as well (SDQ). 	<ul style="list-style-type: none"> • Siblings of children with autism were seen to have more peer problems, overall adjustment problems, and lower levels of prosocial behavior. • Complex relationships could not be measured. 	<ul style="list-style-type: none"> • This study showed that some siblings had severe adjustment problems meanwhile other siblings had no adjustment problems. • Other psychological factors relating to parents should be researched.
<p>Pilowsky et al., 2004 [14]</p>	<p>Study Design: Cross - Sectional Sample:</p> <ul style="list-style-type: none"> • Thirty siblings of children with autism. • Twenty eight siblings of children with mental retardation. <ul style="list-style-type: none"> • Thirty of children with DLD <p>Measures:</p> <ul style="list-style-type: none"> • Weinberger Adjustment Inventory (WAI). • Vineland Adaptive Behavior Scale (VABS) - Social Domain <ul style="list-style-type: none"> • Child Behavior Checklist (CBCL). • Daily Hassles and Uplifts Questionnaire. <ul style="list-style-type: none"> • Family History Questionnaire. • Kiddie-Schedule for Affective Disorders and Schizophrenia for school aged children - Epidemiological version (Kiddie-SADS). 	<ul style="list-style-type: none"> • No difference in the rate of autism spectrum diagnoses among the groups. • Majority of children found to be of normal functioning. • Siblings age was associated with more positive emotional description of the proband. • Probands verbal ability was related to adjustment in both the autism group and the mental retardation group. • Larger families accounted for a greater delay in socialization skills 	<ul style="list-style-type: none"> • Surprisingly siblings of children with autism are well adjusted. <p>Limitations:</p> <ul style="list-style-type: none"> • Small sample size could have affected the statistical power of the analysis.
<p>Macks et al., 2007 [30]</p>	<p>Study Design: Cross - Sectional Sample:</p> <ul style="list-style-type: none"> • Fifty-one siblings of children with autism <ul style="list-style-type: none"> • Thirty-five sibling of non-disabled children. <p>Measures:</p> <ul style="list-style-type: none"> • Children’s Depression Inventory-Short From (CDI-S) • Behavior Assessment System for Children- Parent Rating Scales (BASC-PRS) 	<ul style="list-style-type: none"> • Siblings of children with autism had a more positive self-report than siblings of non-disabled children. • Psychosocial and emotional adjustment was more prevalent for siblings of children with autism than siblings of non-disabled children. 	<ul style="list-style-type: none"> • Future studies should involve multiple respondents and examine, in depth, other demographic characteristics. • Siblings are likely to be the closest to children with autism than any other individual present.

<p>Trajkovski et al., 2008 [31]</p>	<p>Study Design: Cross - Sectional Sample: • Thirty-five participants with autism • Twenty-one of their siblings Measures: • Ten mL of venous blood was drawn from each donor. • No autistic children were receiving medication at the time of the blood drawing.</p>	<p>• Analysis of the blood results revealed significant higher levels of plasma concentrations</p>	<p>• Comparisons of food allergens between autistic participants and their siblings could not be compared directly.</p>
<p>Rivers et al., 2003 [32]</p>	<p>Study Design: Cross - Sectional Sample: • Parent-sibling triads from fifty families (49 mothers and 1 father). Measures: • Sibling Inventory of Behavior (SIB). • Modified version of the Satisfaction with the Sibling Relationship Scale. • Marital Strains subscale of the FILE. • Family Crisis Oriented Personal Evaluation Scale (F-COPES).</p>	<p>• Typical developing siblings were positive in their ratings in regards to their relationships with their siblings diagnosed with autism. • No significant findings that related sibling measures with demographic characteristics. • When marital stress increased the quality of the sibling relationships declined.</p>	<p>• Strength was derived from the use of the siblings as the source of information about the sibling relationships. • Study supports and extends research in the field of sibling relationships. • Further research would be needed to clarify the direction of effect of the associations present in this study.</p>
<p>Cassel et al., 2007 [33]</p>	<p>Study Design: Cross - Sectional Sample: • Thirty-one infants with older siblings with ASD. Measures: • All infants participated with a parent in the FFSF. • FFSF was coded by coders certified in the Facial Action Coding System (FACS). • Respondent to Joint Attention (RJA).</p>	<p>• Infant siblings of children with ASD have an increased risk to develop ASD or deficits of the broad phenotype. • At 6 months ASD-sibs smiled for a lower portion of time during the FFSF than did children of TD-sibs with their parents.</p>	<p>Limitations: • Small sample size. • Lack of ESCS measures.</p>
<p>Toth et al., 2007 [34]</p>	<p>Study Design: Cross - Sectional Sample: • Forty two non-autistic siblings of children with autism. • Twenty toddlers with no family history of autism. • Ages 18 - 27 months. Measures: • Standardized diagnostic assessment. • Mullen Scales of Early Learning. • The Vineland Social-Emotional Early Childhood Scales (SEEC). • Communication and Symbolic Behavior Scale Developmental Profile (CSBS-DP). • Battery developed by Meltzoff (10 immediate and 5 deferred Imitation tasks). • Play Assessment Scale (PAS). • Early Development Interview (EDI). • Brief Symptom Inventory (BSI).</p>	<p>• Siblings of children with autism demonstrated a variable profile. • Had decrements in certain aspects of communication and language, but had intact skills in other areas. • Siblings exhibited less symbolic behaviors overall. • Siblings showed greater social difficulties. • Families of both groups showed similar levels of marital adjustment, marital satisfaction, and mental health.</p>	<p>• Strength of this study was the sample size that was present (compared to previous studies). • Obtain different results than previous studies in regards to joint attention. • Certain aspects of cognitive ability, language, social functioning, and adaptive behavior are affected in non-autistic siblings of children with autism.</p>

<p>Goldberg et al., 2005 [35]</p>	<p>Study Design: Cross-sectional Study Sample: 25 children; 17 boys and 8 girls. Of the sample 68% white, 16% Hispanic, *% Asian, and 8% mixed.</p> <p>Measures:</p> <ul style="list-style-type: none"> • ADI-R • ADOS-G • Childhood Autism Rating Scale (CARS) • Early Social Communications Scales (ESCS) 	<p>Social and communication behaviors of the younger siblings resembled the ASD children more than the normally developed children</p>	<p>Limitation: Small nonprobability sample</p>
<p>Fisman et al., 1996 [36]</p>	<p>Study Design: Longitudinal Study Sample: Forty-six siblings of children with PDD, 45 siblings of children with mental retardation, and 46 normal children.</p> <p>Measures:</p> <ul style="list-style-type: none"> • The normative Adaptive Behavior Checklist • Self-Perception Profile for Children • Social Support Scale for Children • Parent Psychosocial Characteristics and Relationship <ul style="list-style-type: none"> • The Dynamic Adjustment Scale • The Beck Depression Inventory • Family Adaptability and Cohesion Evaluation Scale. (FACES III) • Siblings Relationship Questionnaire - Brief Version 	<ul style="list-style-type: none"> • More difficulties were found with siblings of children with PDD compared to the siblings of children with mental retardation and siblings of children without any disability. 	<p>Limitation: Rater bias on the by use of the self-report measures</p>
<p>Kaminsky et al., 2002 [15]</p>	<p>Study Design: Cross-sectional. Sample: Ninety normally developed children and adolescents between the ages of 8- 18 years of age.</p> <p>Measures:</p> <ul style="list-style-type: none"> • Achenbach Child Behavior Checklist (CBCL) • Social Support Scale for Children • Loneliness and Social Dissatisfaction Questionnaire • Adaptive Behavior Questionnaire • Demographics Questionnaire 	<ul style="list-style-type: none"> • Siblings of children with Autism, as well as the comparison groups all indicated low levels of loneliness. • Siblings of children with Autism reported receiving high levels of social support. 	<p>Limitation:</p> <ul style="list-style-type: none"> • Large amount of the siblings were older than the child with Autism. • Gender Distribution of the children with Autism
<p>Verte et al., 2003 [37]</p>	<p>Study Design: Cross-sectional. Sample: Twenty-nine siblings of children with High Functioning Autism (HFA), and 29 siblings of children without disabilities</p> <p>Measures:</p> <ul style="list-style-type: none"> • Parenting Stress Index 	<ul style="list-style-type: none"> • Siblings of children with HFA between the ages of 6-11 showed significantly more behavioral problem than the control group. • Sisters of children between the ages of 12-16 had a better self-concept. 	<p>Limitation: Small nonprobability sample</p>

<p>Yirmiya et al., 2007 [38]</p>	<p>Study Design: Cross-sectional Study Sample: Thirty siblings of children with Autism and 30 siblings of normally developed children Measures: •BSID-II •RDLS •CHAT •K-ABCCELF-Preschool •SCQ •Survey of clinical and/or educational interventions</p>	<p>No significant cross gender differences • There were no significant differences in cognitive and language ability • The siblings of children with autism did have less ability in expressive and receptive languages</p>	<p>Limitation: • Genetics were not taken into consideration</p>
<p>Jones et al., 2004 [39]</p>	<p>Study Design: Cross-sectional study Sample: Three children with Autism who were each paired with one sibling Measures: • Modeling Intervention</p>	<p>• The three children all responded to the stimuli although one child out of the three were able to respond correctly across all stimuli</p>	<p>Limitations: • Non structured environment • Small sample</p>
<p>Kern et al., 1982 [40]</p>	<p>Study Design: Cross-sectional Study Sample: Three children with Autism who were each paired with one sibling Measures: • Observational</p>	<p>• With the inclusion of the intervention method the amount of aggression the sibling inflicted on the child with Autism decreased</p>	<p>Limitation: • Small non-probability sample</p>
<p>Burton et al., 1994 [41]</p>	<p>Study Design: Cross-sectional. Sample: Sixty student between the ages of 18 and 23 years of age (30 siblings Ns and 24 of the 30 Ds) Measures: • Sibling demographic and background questionnaire •Rosenberg •Self Esteem Scale •Rotter •Internal/External Locust of ControlScale •SiblingEvaluation Questionnaire</p>	<p>• Each young adult with a sibling with disabilities had chosen to work in a helping industry, they also felt that living with a child with disabilities help them be more responsible but they also felt guilt, isolation, and embarrassment</p>	<p>Limitation: • Small sample</p>
<p>Gold et al., 1993 [42]</p>	<p>Study Design: Cross-sectional. Sample: Twenty-two siblings of boys with Autism, and 34 siblings of nondisabled boys Measures: •CDI •CBCL</p>	<p>• Siblings of autistic boys scored significantly higher than siblings of nondisabled children on the CDI • No gender differences were found otherwise</p>	<p>Limitation: • Small non-probability sample size</p>
<p>Ferrari M, Matthews WS 1983 [43]</p>	<p>Study Design: Cross-sectional. Sample: Forty-eight children with autism and 96 parents Measures: • Achenbach's Child Behavior Checklist •Pier-Harris •CDC • Inventory of Socially supportive behaviors</p>	<p>• No significant evidence to support the fact that siblings of children with disabilities are more inclined to have psychological disorders</p>	<p>Limitation: • Small non-probability sample</p>

Table 1: Review of the literature regarding siblings of individuals with ASD.

Methods

Study Design

This was a web-based survey, exploring levels of peer victimization and DSM-IV-TR diagnosis of siblings of individuals diagnosed with an Autism Spectrum Disorder (ASD). Siblings of individuals with ASD were contacted by the Interactive Autism Network (IAN) and were asked to participate in an online survey. A total of 25 siblings participated in the study. In final analysis ten of the participants were eligible for inclusion. The online questionnaires were completed by the participants in the study using the Qualtrics online survey system. The design had backward directionality and retrospective timing.

The strength of this study was the fact that the design allowed for collecting data from a much larger sample than would have been possible if interviews were conducted at a lower cost and in a briefer time period. The weaknesses of the design were that it did not include a control group and information was subject to recall bias.

Sampling Plan

The sample included siblings of an individual diagnosed with ASD and are registered with the Interactive Autism Network (IAN). An inclusion criterion for the study was a sibling who grew up or currently residing in a household where their sibling is a child on the spectrum. Information about the study was sent to individuals who met the above inclusion criteria via IAN. The Interactive Autism Network (IAN) is an innovative online project bringing together tens of thousands of people affected by autism spectrum disorders and hundreds of researchers in a search for answers. A non-probability sampling, using a purposive sampling technique was used to collect data.

Measures

Peer victimization was measured using the Social Experience Questionnaire [44]. This measure is a summated rating scale and had three subscales that measured Overt Victimization, Relational Victimization and Recipient of Prosocial Behaviors. Each of the subscales had 5 items and the total scale has 15 items. Examples of items in the Overt Victimization subscale are: "How often do you get hit by another kid at school? And "How often does another kid yell at you and call you mean names?" Examples of items in the Relational Victimization subscale are: "How often do other kids leave you out on purpose when it is time to play or do an activity? And "How often does a kid who is mad at you try to get back at you by not letting you be in their group anymore?" Examples of items in the Recipient and Prosocial Behavior subscale are: "How often does another kid try to cheer you up when you feel sad or upset? And "How often does another kid give you help when you need it?" Response categories ranged from 1 = never to 5 = all

of the time. The theoretical range for the peer victimization scale was 15 to 75. Higher scores indicated more severe victimization. The cutoff scores for the overt victimization subscale are 3.9 and a 4.3 for the relational victimization subscale. Test-retest reliability over a four-week interval was .90 in a sample of 474 third through sixth grade children from four public schools in a moderately sized Midwestern town. Cronbach's alpha for the subscales was .76 for the Overt Victimization subscale, .86 for the Relational Victimization subscale and .76 for the Recipient of Prosocial Behaviors subscale [44].

Data on Major Depressive Disorder, Dysthymia and Generalized Anxiety Disorder were all obtained using the Patient Health Questionnaire (PHQ) [45]. The PHQ is a self-reporting measure that assesses mood, anxiety disorder, and other disorders in care patients. The PHQ was designed to quickly obtain data to determine whether or not it is probable that a respondent currently has an anxiety or depressive disorder. Level of social support was measured using the Multidimensional Scale of Perceived Social Support [46]. This scale consisted of 12 items that measured level of social support from three different sources: family, friends, and significant others. Four items, each of which was a statement for which degree of agreement or disagreement was required, assessed social support for each source. A higher score on the scale indicated greater levels of social support. Cronbach's alpha for the total scale was .88 and for the significant other, family subscale and friends subscales, the alphas were .91, .87 and .85 respectively.

Results

(Table 2) shows the socio-demographics characteristics of the sibling in the study. Only females completed the full data collection instrument which resulted in a 100% female gender sample. The average age of the sibling in the sample was 25.9 years (SD=9.21). About 50% of the sample were married or living with a partner and 90% were identified as Caucasians. Only 40% of the sample were employed and had an annual income of between 20,000 to 50,000 dollars per year. (Table 3) presents the diagnostic disorders of the sample. About 70% of the sample met the diagnostic criteria of DSM-IV-TR for Major Depressive Disorder and 40% of the sample met the diagnostic criteria for Generalized Anxiety Disorder. None of the participants met the diagnostic criteria for Dysthymia Disorder. As seen in (Table 4), the average number of depressive symptoms reported by participants were 5.6 (SD=1.9). Siblings reported on relatively high levels of peer victimization. Participants reported on a score of 5.8 (SD=1.23) on the scale of overt victimization and a score of 7.2(SD=2.25) on the sub scale for relational victimization. These results from the above subscales indicate that siblings of individuals diagnosed with ASD may experience peer victimization as the cutoff scores for the overt victimization subscale are 3.9 and a 4.3 for the relational victimization subscale. No additional significant findings were

found in the sample when correlations were conducted (Table 5).

	N	%
Gender		
Male	0	0.0
Female	10	100.0
Age		
Range	19-50	
Mean	25.90	
SD	9.21	
Marital Status		
Married	2	20.0
Living with Partner	3	30.0
Single	5	50.0
Racial/Ethnic Group		
African American	1	10.0
Caucasian	9	90.0
Education		
Freshman	1	10.0
Sophomore	1	10.0
Junior	1	10.0
Senior	2	20.0
1 st year Master's Degree	2	20.0
2 nd year Master's Degree	2	20.0
3 rd year Master's Degree	1	10.0
Employed		
Yes	4	40.0
No	6	60.0
Income		
Less than \$20,000	5	50.0
\$20,001 to \$50,000	4	40.0
Over \$80,000	1	10.0

Table 2: Demographic Characteristics.

	N	%
Diagnosis of MDD		
Yes	7	70.0
No	3	30.0
Diagnosis of Dysthymic Disorder		
Yes	0	0.0
No	10	100.0
Diagnosis of GAD		
Yes	4	40.0
No	6	60.0

Table 3: Diagnostic Characteristics.

	Range	Mean	SD
Total Number of Depressive Symptoms	0-8	5.60	1.90
Level of Overt Victimization	5-25	5.80	1.23
Level of Relational Victimization	5-25	7.20	2.25
Amount of Prosocial Recipient Behavior	5-25	18.90	3.70
Level of Total Victimization	15-75	31.90	4.63
Level of Social Support From Significant Others	7-28	24.80	4.24
Level of Social Support From Family	7-28	25.30	4.64
Level of Social Support From Friends	7-28	21.40	4.67
Total Level of Social Support	12-84	71.50	11.69

Table 4: Other characteristics.

	Age	Depression Symptoms	Overt Victimization	Relational Victimization	Prosocial Behavior	Total Victimization	Social Support from SO	Social Support from family	Social Support from friends	Total Social Support
Age	**									
Depression Symptoms	-.34	**								
Over Victimization	-.01	-.07	**							
Relational Victimization	.05	.19	.29	**						
Prosocial Behavior	.15	-.29	.19	.15	**					
Total Victimization	.23	-.22	.40	.64*	.81*	**				

Social Support from SO	.31	-.28	.12	-.45	.74*	.32	**			
Social Support from family	-.39	-.08	-.06	-.29	.45	.19	.42	**		
Social Support from friends	-.33	-.08	.00	.00	.57	.47	.32	.61	**	
Total Social Support	-.26	-.28	.22	-.20	.74*	.49	.65*	.80*	.84*	**

Table 5: Correlations.

Discussion

Clinical Implications

According to the findings presented in this study, peer victimization and mood disorder as well as anxiety related disorders can be prevalent among siblings of individuals on the spectrum. Consistent with previously reported data, females and siblings who grew up in a household with a child diagnosed with ASD may be at a higher risk for developing mental health related issues. Assessment and interventions with families who care for a child on the spectrum should include a component to evaluate and address any potential mental health issues presented by siblings. As mentioned earlier, parents can present with elevated levels of stress and exhibit mental health related issues as a result of caring for a child with ASD. Parent’s stress and mental health issues alongside the diagnosis of autism can place the neurotypical sibling at risk for developing mental health issues.

Limitations and Strengths

Lack of research on the topic also presented limitation in available background and literature review for this study. One of the major limitations in this study was the small sample size. The representativeness of the study population limits generalizability only to individuals who were part of the IAN. Individuals who completed the survey online also did not answer all the questions which did not allow the use of the responses for analyses purposes as much of the data collected was in the format of scales and standardized measures. This study has numeral of methodological and theoretical strengths. The usage of standardized scales to assess mood and anxiety disorders assisted in obtaining a more precise report of the disorder. The use of a Web-based survey allowed for an inclusion of a larger geographical area for participant’s recruitment.

Research Implications

The development of a risk assessment protocol and evaluation for siblings of individuals with ASD is requiring attention and future focus. For a population at risk for development of comorbid disorders as well as being peer victimized, a comprehensive evaluation of risk factors in research would assist in early

identification and treatment services provided to siblings of individuals on the spectrum. Access to a larger community based sample may assist in providing a more accurate profile of siblings of individuals on the spectrum and will assist in the generalizability of findings. Research methodology should also consider using qualitative methods of analyses as these can provide an insight to the experiential reality of siblings of individuals on the spectrum.

References

- Centers for Disease Control, Autistic spectrum disorders among children. Diagnostic and statistical manual 2014.
- Shtayermman O (2007) Peer Victimization in Adolescents and Young Adults Diagnosed with Asperger’s Syndrome: A Link to Depressive Symptomatology, Anxiety Symptomatology and Suicidal Ideation. *Issues in Comprehensive Pediatric Nursing* 3: 87-107.
- Dąbrowska AA, Pisula EE (2010) Parenting stress and coping styles in mothers and fathers of pre-school children with autism and Down syndrome. *Journal of Intellectual Disability Research* 54: 266-280.
- VanBergeijk E, Klin A, Volkmar F (2008) Supporting More Able Students on the Autism Spectrum: College and Beyond. *Journal of Autism & Developmental Disorders* 38: 1359-1370.
- Hastings RP, Kovshoff H, Brown T, Ward NJ, Espinosa FD, et al. (2005) Coping strategies in mothers and fathers of preschool and school-age children with autism. *Autism* 9: 377-391.
- Meadan H, Stoner J, Angell M (2010) Review of Literature Related to the Social, Emotional, and Behavioral Adjustment of Siblings of Individuals with Autism Spectrum Disorder. *Journal of Developmental & Physical Disabilities* 22: 83-100.
- Gray DE (1993) Perceptions of stigma: the parents of autistic children. *Sociology of Health & Illness* 15: 102-120.
- Mor N, Berkson G (2003) Attitudes Toward Stereotyped Behaviors. *Journal of Developmental & Physical Disabilities* 15: 351-365.
- Juvonen J, Graham S, Schuster MA (2003) Bullying among young adolescents: The Strong, the Weak, and the Troubled. *Pediatrics* 112: 1231-1237.
- Flynt SW, Morton RC (2004) Bullying and children with disabilities. *Journal of Instructional Psychology* 31: 330-333.
- Orsmond GI, Seltzer MM (2007) Siblings of individuals with autism or Down syndrome: effects on adult lives. *Journal of Intellectual Disability Research* 51: 682-696.

12. Shtayermman O (2013) Stress and marital satisfaction of parents to children diagnosed with autism. *Journal of Family Social Work* 16: 243-259.
13. Cebula K (2012) Applied Behavior Analysis Programs for Autism: Sibling Psychosocial Adjustment During and Following Intervention Use. *Journal of Autism & Developmental Disorders* 42: 847-862.
14. Pilowsky T, Yirmiya N, Doppelt O, Gross-Tsur V, Shalev RS (2004) Social and emotional adjustment of siblings of children with autism. *Journal of Child Psychology & Psychiatry* 45: 855-865.
15. Kaminsky L, Dewey D (2002) Psychosocial adjustment in siblings of children with autism. *Journal of Child Psychology & Psychiatry & Allied Disciplines* 43: 225-232.
16. Shivers C, Deisenroth L, Taylor J (2013) Patterns and Predictors of Anxiety Among Siblings of Children with Autism Spectrum Disorders. *Journal of Autism & Developmental Disorders* 43: 1336-1346.
17. Orsmond GI, Seltzer M (2009) Adolescent Siblings of Individuals with an Autism Spectrum Disorder: Testing a Diathesis-Stress Model of Sibling Well-Being. *Journal of Autism & Developmental Disorders* 39: 1053-1065.
18. Hankin BL, Abramson LY, Siler M (2001) A prospective test of the hopelessness theory of depression in adolescence. *Cognitive Therapy and Research* 25: 607-632.
19. Yirmiya N, Gamliel I, Pilowsky T, Feldman R, Baron-Cohen S, et al. (2006) The development of siblings of children with autism at 4 and 14 months: Social engagement, communication, and cognition. *Journal of Child Psychology and Psychiatry* 47: 511-523.
20. Kaminsky L, Dewey D (2001) Siblings relationships of children with autism. *Journal of Autism and Developmental Disorders* 31: 399-410.
21. Hastings RP (2003) Behavioral adjustment of siblings of children with autism engaged in applied behavior analysis early intervention programs: the moderating role of social support. *Journal of autism and developmental disorders* 33: 141-150.
22. Rossiter L, Sharpe D (2001) The Siblings of Individuals with Mental Retardation: A Quantitative Integration of the Literature. *Journal of Child and Family Studies* 10: 65-84.
23. Pilowsky T, Yirmiya N, Shalev R, Gross-Tzur V (2007) Neuropsychological functioning of siblings of children with autism, siblings of children with developmental language delay, and siblings of children with mental retardation of unknown genetic etiology. *Journal of Autism and Developmental Disorders* 37: 537-552.
24. Kohler FK (1999) Examining the services received by young children with autism and their families: A survey of parent responses. *Focus on Autism and Other Developmental Disabilities* 14: 150-158.
25. Presmanes A, Walden T, Stone W, Yoder P (2007) Effects of different attentional cues on responding to joint attention in younger siblings of children with autism spectrum disorders. *Journal of Autism and Developmental Disorders* 37: 133-144.
26. Goin-Kochel RP, Abbacchi A, Constantino JN (2007) Lack of evidence for increased genetic loading for autism among families of affected females: a replication from family history data in two large samples. *Autism* 11: 279-286.
27. Rivers JW, Stoneman ZJ (2008) Child Temperaments, Differential Parenting, and the Sibling Relationships of Children with Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders* 38: 1740-1750.
28. Gamliel I, Yirmiya N, Sigman M (2007) The development of young siblings of children with autism from 4 to 54 months. *Journal of Autism and Developmental Disorders* 37: 171-183.
29. Hastings RP (2003b) Behavioral adjustment of siblings of children with autism engaged in applied behavioral analysis early intervention programs: The moderating role of social support. *Journal of Autism and Developmental Disorders* 33: 141-150.
30. Macks RJ, Reeve RE (2007) The adjustment of non-disabled siblings of children with autism. *Journal of Autism & Developmental Disorders* 37: 1060-1067.
31. Trajkovski V, Petlichkovski A, Efinanska-Mladenovska O, Trajkov D, Arsov T, et al. (2008) Higher Plasma Cocentrations of Food-Specific Antibodies in Persons with Autistic Disorder in Comparison to Their Siblings. *Focus on Autism and Other Developmental Disabilities* 23: 176-185.
32. Rivers JW, Stoneman Z (2003) Sibling Relationships When a Child Has Autism: Marital Stress and Support Coping. *Journal of Autism and Developmental Disorders* 33: 383-394.
33. Cassel TD, Messinger DS, Ibanez LV, Haltiga JD, Acosta SI, et al. (2007) Early Social and Emotional Communication in the Infant Siblings of Children with Autism Spectrum Disorders: An Examination of the Broad Phenotype. *Journal of Autism and Developmental Disorders* 37: 122-132.
34. Toth K, Dawson G, Meltzoff AN, Greenson J, Fein D (2007) Early social, imitation, play, and language abilities of young non-autistic siblings of children with autism. *Journal of Autism and Developmental Disorders* 37: 145-157.
35. Goldberg MC, Mostofsky SH, Cutting LE, Mahone EM, Astor BC, et al. (2005) Subtle Executive Impairment in Children with Autism and Children with ADHD. *Journal of Autism and Developmental Disorders* 35: 279-293.
36. Fisman S, Wolf L, Ellison D, Gillis B, Freeman T, et al. (1996) Risk and protective factors affecting the adjustment of siblings of children with chronic disabilities. *Journal of the American Academy of Child and Adolescent Psychiatry* 35: 1532-1541.
37. Verte S, Roeyers H, Buysse A (2003) Behavioural problems, social competence, and self-concept in siblings of children with autism. *Child: Care, Health, and Development* 29: 193-205.
38. Yirmiya N, Ozonoff SJ (2007) The Very Early Autism Phenotype. *Journal of Autism and Developmental Disorders* 37: 1-11.
39. Jones CD, Schwartz S (2004) Siblings, Peers, and Adults Differential Effects of Models for Children with Autism. *Topics in Early Childhood Education* 24: 187-198.
40. Kern L, Koegel RL, Dyer K, Blew PA, Fenton LR (1982) The effects of physical exercise on self-stimulation and appropriate responding in autistic children. *Journal of Autism and Developmental Disorders* 12: 399-419.
41. Burton SL, Parks AL (1994) Self-esteem, locus of control, and career aspirations of college-age siblings of individuals with disabilities. *Social Work Research* 18: 178-185.

42. Gold N (1993) Depression and social adjustment in siblings of boys with autism. *Autism Dev Disord* 23: 147-163.
43. Ferrari M, Matthews WS (1983) Self-recognition deficits in autism: syndrome-specific or general developmental delay? *J Autism Dev Disord* 13: 317-324.
44. Crick NR, Grotpeter JK (1996) Children's treatment by peers. *Development and Psychopathology* 8: 367-380.
45. Johnson JG, Harris ES, Spitzer RL, Williams JB (2000) The patient health questionnaire for adolescents. *Journal of Adolescent Health* 30: 196-204.
46. Zimet GD, Dahlem NW, Zimet SG, Farley GK (1988) The multidimensional scale of perceived social support. *Journal of Personality Assessment* 52: 30-41.