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The Biological and Psychological Needs of Adolescents with Autism Spectrum Disorder

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ABSTRACT Autism spectrum disorder (ASD) has become a major concern for parents and educators in recent years. It is the most recent nomenclature for developmental disorders characterized by impaired social interactions and communication of the personality, with a stereotypic behavior. The growing international literature demonstrates that there are differences between a preadolescent and an adolescent autistic young person. Adolescents with autism spectrum disorder usually have to respond to changes in social skills and personality development. The present paper adds to this body of literature through its focus on social skills, communication, behavioral problems and cognitive maturity among 80 subjects (40 between 10-12 years and 40 between 14-16 years) with autism spectrum disorder based on the DSM-V criteria. All participants were referred to the investigations by their therapists and the therapists discussed the study with the parents. The following instruments were used in the research: Indian Scale for Assessment of Autism (ISAA), Child Behavior Checklist 6-18 (CBCL) and Social Communication Questionnaire (SCQ). Majority (38) of our children between 10-12 years had total ISAA score within the range 107-153 (moderate autism) while only 2 children had ISAA scores within the range 70-106 (mild autism). In the second group 37 adolescents had total ISAA scores from 107 to 153(moderate autism) and 3 of them had ISAA scores from 70 to 106 (mild autism). The results showed that there were positive and significant relationships between social problems and age ($F_{1, 78}$=103.579, p=.000) and social skills and age (r=.132, p<.05). At the same time there was a positive correlation between speech language, communication and age (r=.234, p<.01) and cognitive maturity and age (r=.314, p<.01) among adolescents and preadolescents with autism. The present study concluded that there was an association between behavioral problems, social skills, speech language, communication, cognitive maturity and age among children with autism spectrum disorder. On the basis of the obtained results we will try to provide some recommendations for reducing the level of violent behavior, to change their social expectations and their behavioral problems. However, the inclusion of a young person with ASD in regular primary and secondary education can be advantageous for all students if it is conducted in an appropriate manner with an adequate professional support.

Keywords: autism spectrum disorder, behavioral problems, social skills, cognitive maturity, inclusion

Introduction

The formed documentation on autism dates back to 1943, when a child psychiatrist living in the United States, Leo Kanner, published a paper describing a group of eleven children and the difficulties they shared. He proposed that these children suffered from a psychological disorder, which he named "infantile autism". One year after Kanner's report appeared, a pediatrician living in Germany, Hans Asperger, described a set of symptoms, and later called it Asperger Syndrome, which was similar to Kanner's account of autism.

However, accounts of "autistic" features throughout history suggest that autism is not a modern phenomenon. One well-documented historical case study from 1745, describes an adult man suffering from "silent madness". His traits meet the contemporary criteria for autism (Houston & Frith, 2000). The first recognition of an autistic child in a clinical setting dates back to1799, when John Hassam, a British apothecary, described a five-year-old boy, who did not speak until his fourth year, who did not join older children in play, who exhibited a typical pragmatic language and spoke about himself in the third person. A paper published in the Journal fur Kinderkrankheiten in 1846, still a century before Kanner and Asperger, includes a description of a group of children that had autistic features. These children were described as good-looking, however sensitive, easily agitated, rarely learning to speak, focused on themselves, seemingly dead and showing little attention to their surroundings. At that time, there was no concept of autism, so these autistic features could not be recognized as belonging to a single syndrome. Still, they were apparent enough to be documented in a clinical journal.

There have been great changes in the past decade in the conceptualization of autism and related disorders, eventually reflected in the draft version of the fifth edition of the Diagnostic and Statistical Manual of Mental Disorder (American Psychiatric Association, 2013).Indeed, the proposed revisions of the precedent edition of the manual (DSM-IV-TR) include the combination of specific DSM-IV-TR diagnosis into a single broad autism spectrum disorder (ASD).

What is autism spectrum disorder?

Autism spectrum disorder is a serious neurodevelopment disorder that impairs a child's ability to communicate and interact with others. It also includes restricted repetitive behaviour, interests and activities. These issues cause significant impairment in social, occupational and other areas of functioning.

Autism spectrum disorder, which is often referred to as ASD, is the term used to describe a group of disorders that includes: autism, Asperger syndrome, childhood disintegrative disorder and pervasive development disorder. The symptoms associated with autism spectrum disorder appear early in a child's development and therefore it is considered a "developmental disorder". Recent research suggests than on average, one in 160 children will be diagnosed with autism spectrum disorder, with boys outnumbering girls by four on one (Centres for Disease Control, 2008). It is estimated that about 60 of 10.000 children worldwide are diagnosed with autism (National Autistic Society, 2014). As this number continues to increase, there is an even greater need to research successful strategies to help children with autism spectrum disorder.

The biological and psychological pathways of autism spectrum disorder

It is known that individuals with autism spectrum disorder differ in terms of language ability, ranging from lack of speech to fluent language, and in terms of cognitive development, ranging from significant intellectual disability to above-average intellectual functioning. Individuals may show associated comorbidities including epilepsy and minor physical anomalies, as well as psychiatric comorbidities, thus showing a wide clinical heterogeneity. The clinical heterogeneity of autism has long been a way to understand the path of the involved physiological mechanisms. The results suggest that autism may be caused by a multitude of genetic alterations that ultimately affect the biological pathways of brain development and plasticity (Mules, Trentacoste & Rapine, 2004).

Because of the high heritability, a major focus in the research in autism has been on finding the underlying genetic causes with less emphasis on potential environmental triggers or causes. Although remarkable advances in our knowledge of genetic causes have resulted from these great efforts made in the field of genetics, research debates about increasing prevalence (Weintraub, 2011) or heritability (Halmahera et al,.2011) have highlighted the necessity to expand the research on environmental factors. In fact, both genetics and environment may play a role.

** Genetic problems*

Several different genes appear to be involved in autistic spectrum disorder. For some children, autistic spectrum disorder can be associated with a genetic disorder, such as Rett syndrome or fragile X syndrome, or cytogenetic abnormalities (Samaria, 2007). The genetic alterations, such as the 15 ql-q13 duplication of the maternal allele, associated with autism spectrum disorder affect synaptic plasticity (Bryson et al., 2003). For other children genetic changes may make a child more susceptible to autism spectrum disorder, along with created environmental risk factors. Still other genes may affect brain development or the way that brain cells communicate, or they may determine the severity of symptoms. Some genetic problems seem to be inherited, while others happen spontaneously.

** Environmental factors*

Researchers are currently exploring whether factors such as viral infections, complications during pregnancy, parents' age, socioeconomic status of the family, and drug or toxic exposure, play a role in triggering autistic spectrum disorder.

** Gene-environment interaction*

The existence of interactions between genetic background and environmental factors in autism was first suggested for prenatal and postnatal complications. Children with autism may react differently to the same environmental stimuli and have less tolerance to the prenatal or postnatal experience. Studies of animal models have suggested that genetic defects in the synaptic function may alter the sensitivity to the environment (Bryson et al., 2003).

Autism in early childhood

Autism spectrum disorder impacts how a child perceives and socializes with others, causing problems in crucial areas of development, social interaction, communication, and behaviour.

Some children show signs of autism spectrum disorder in early infancy. Other children may act normally during the first few months or years of life, but suddenly become withdrawn, express aggression or lose the language skills they have already acquired.

One on the unique qualities of autism spectrum disorder is the manifestation of a specific behaviour. Autism spectrum disorder is considered a neurodevelopment disorder where according to the DSM-V criteria, the diagnosis of symptoms occurs before the age of three years (Capps et al.,1998). In early childhood, children who are diagnosed with autism spectrum disorder display certain behaviours that educators, parents and teachers might observe. Children with autism spectrum disorder will display various developmental delays, delays in their communicative development, and difficulties in their social development/social functioning (Voilkmar et al., 2005).

In fact, children with autism spectrum disorder often find it difficult to follow social rules, which may make them seem unfriendly. When interacting with others, those with autism disorder may not follow common social behaviours. Hence, we can see that children with autism spectrum disorder have trouble managing their behavior in person-to-person relations, such as taking turns with peers, eye contact, and lack of engagement in play or social interactions with their friends. As the same time, they have a difficulty in acquiring language, they communicate less frequently with people, and use non-verbal gestures (Sulzer-Azaroff & Mayer, 1991).

Communication skills vary depending on the intellectual and social development of the individual child. Some children with autism spectrum disorder speak very little, but the others appear to have normal speech. Still, those that do have developed speech often find it difficult to communicate effectively. Usually children with autism understand non-verbal communication such as facial expressions and hand gestures including printing.

Children with autism spectrum disorder rarely play or engage in imaginative play (Baron-Cohen, 1988). They may use toys and other objects in unusual ways. They can be noticed with an item such as a pick of string or a pencil and carry it around constantly and may collect objects. Usually children with autism spectrum disorder avoid participating in interactions with their peers (Ravioli, Gossiping, & Walter, 2012). They play alone; have unusual gazes and speech compared to other individuals. It becomes very difficult for peers and adults when the child starts kindergarten and primary school.

Autism in adolescents

When considering the issue of adolescence and its effect on young people with autism spectrum disorders, we need to consider the changes that this stage of life and development brings to all young people. Children with autism spectrum disorder will find themselves growing as they enter into adolescence (Schell & McDonough, 2010). Adolescents with autism spectrum disorder have similar patterns of behaviour like the children with this disorder, but during this period there are improvements in their symptoms, adaptive behaviour or empathy for others (McGovern & Sigman, 2005). These improvements help children start to socially interact with their peers. During high school, being able to form friendships and belong to a social group is an essential part of adolescence.

So, adolescents with autism spectrum disorders usually have to respond to changes in social skills and personality development without the opportunity for a peer group discussion and support. If adolescents with autism disorder do not have the op-

portunity to talk and learn from other adolescents, it can be helpful for them to talk to parents and teachers who have "been there" and know about adolescence, have life experience and the maturity that comes with age. It is important to recognize the complexities of this time of change and the conflict that adolescents with autism spectrum disorders feel, for example regarding the need to be an independent person and separate from parents and family (Sigman et al., 1995).

Adolescents with autism spectrum disorder show significant improvements in the use of overall language and ability to communicate nonverbally. During early childhood, social interactions and communication are typically limited, but as children with autism spectrum disorder reach teenage years, there is an increase in social interaction where they are more socially engaged with their peers without disabilities (Sigman & Hungered, 1986).

As children with autism spectrum disorder enter adolescence, social problems typically worsen. They are increasingly more aware of their social status among their peers, and those peers are often not as understanding and accepting at those labelled with a disability in adolescence (Locke et al., 2010).

A young person with an autism spectrum disorder during adolescence may start asking questions about his/her differences at this time. This is an important consequence of the struggle with the sense of identity "Who am I?" for the adolescent with an autism spectrum disorder. Questions and comments such as "Why do kids tease me?"; "Why don't I have any friends?"; "Why aren't they interested in the same things I am?"; "I hate autism"; "I hate friends" may arise at this time. According to this, adolescents with autism spectrum disorder have low social interactions; so, they are excluded or bullied by their peers (Gardner et al., 2014). Same as their peers, they want to be accepted and experience friendships, and however because of their delays in social interactions and the nature of their disorder, it becomes difficult for typically developing peers to fully accept the peers with autism spectrum disorder.

The core features of autism are areas in which difficulties can lead to a feeling of frustration, confusion, anxiety, depression or a lack of control, resulting in behavioural responses. Since behaviour is often a form of communication, many individuals with autism spectrum disorder voice their wants, needs or concerns through their behaviour, rather than by means of words. Adolescents with autism spectrum disorders feel unhappy, unhealthy; they have a higher rate of aggression towards peers without an autistic disorder (Kane & Mazurek, 2011).

At the same time each child with autism spectrum disorder is likely to have a unique pattern of behaviour and level of severity-from low functioning to high functioning. Severity is based on social communication impairments and the restrictive and repetitive nature of the behaviour, along with their impact on the ability to function. So as the child progresses towards adolescence, it is important to teach them new skills and provide the right support for them to be successful in the educational process and working world.

Similar to their typically developing peers, adolescents with autism spectrum disorder have to consider their options for secondary education, perspective employment, independence from their parents and families, and adult support they might need.

Research Methodology

Study objectivities

The main objectives of this study are:

- To assess the prevalence of autism spectrum disorder among preadolescents and adolescents with autism spectrum disorder;
- To determine the level of autism in young persons with autism spectrum disorder;
- To assess the relationship between various behavioral problems and age in children with autism spectrum disorder;
- To assess the relationship between social skills and age in children with autism spectrum disorder;
- To assess the relationship between speech language, communication and age in children with autism spectrum disorder;
- To assess the relationship between cognitive maturity and age in children with autism spectrum disorder;

Participants

The sample of subjects for the study was randomly selected, and their participation in this study was voluntary. The study was conducted in Skopje. 80 parents with children with autism spectrum disorder were selected from several organizations for children with disabilities in Skopje for the study. The sample was identified through organizations which had children who were diagnosed with autism spectrum disorder based on the DSM-V criteria and were receiving therapy and treatment in these organizations. As presented in Figure 1, the group included 80 children (40 between 10 and 12 years of age and 40 between 14 and 16 years of age).

Of all participants, 31 were female (39%) and 49 were male (61%).

The potential subjects were excluded from the current study if they had associated neurological, genetic, infectious or metabolic disorder, such as fragile-x-symptoms or fetal cytomegalovirus infection. Also, children with severe comorbidity diagnosis, such as major depression and psychological disorders, were excluded.

Data collection tools

Within the scope of study, the following data collection tools were used among parents who had children with autism spectrum disorder: Personal Information Form constructed by researchers, Indian Scale for Assessment of Autism (ISAA), Child

Personal information form

This form includes data regarding participants' demographic details such as gender and age.

Indian Scale for Assessment of Autism (ISAA)

The ISAA is a 40-item scale divided into six domains-Social relationship and Reciprocity (9 questions); Emotional Responsiveness (5 questions); Speech Language and Communication (9 questions); Behavior Patterns (7 questions); Sensory Aspects (6 questions) and Cognitive Maturity (4 questions). The scores for each item of the ISAA range from 1-5, depending on the intensity frequency and duration of a particular behavior with the following anchors: score1=rarely, score2=sometimes, score3=frequently, score4=mostly, and score5=always. The total ISAA scores range from 40-200(Patrai & Arum, 2011). The lowest score represents no symptoms or symptoms which were present only rarely, and the maximum score indicates the most

severe presentation of autism disorder. The following categories are recommended: mild AD: 70-106, moderate AD: 107-152, severe AD: 153-200. The Cronbach's alpha values ranged from 0.68 to 0.92 on the various subscale.

Child Behavior Checklist (CBCL)

The Child Behavior Checklist (CBCL; Achenbach, 1991) is a parent report form to screen children's emotional, behavioural and social problems. CBCL's questions are associated with problems on a syndrome scale in eight different categories: Anxious/ Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problems, Thought Problems, Attention Problems, Rule-Breaking Behavior, and Aggressive Behavior. The CBCL version 6-18 contains 113 items that are rated on 3-point scales (0-not true, 1-somewhat or sometimes true, 2-very true or often true). The Cronbach's alpha values ranged from 0.78 to 0.86 on the various subscale.

Social Communication Questionnaire (SCQ)

The Social Communication Questionnaire (SCQ) is a 40-item parent-report questionnaire that includes questions regarding the characteristic autistic behavior. Each item is scored 0, 1 or 2, with 1 or 2 being the score for endorsement of each symptom of autism. The total score ranged from 40 to 80, with higher scores indicating higher level of social skills. In this study, the Cronbach's alpha coefficient for internal consistency was 0.82.

Data procedure and data analysis

This was a cross-sectional study that was conducted from September to December 2016. The parents, who had children suffering from autism spectrum disorder, were asked to participate. Once participants read and agreed in regard tothe consent form, they answered the demographic data and the three different questionnaires, out of each few were administered by the researchers and the rest were administered online through a web link, which was given to the parents who were not able to reach the organizations.

The data was analyzed using SPSS (Statistical package for Social Sciences), version 17.0 for the Windows operating system. Correlation analysis (Pearson Correlation and one-way ANOVA) were employed to understand the relationship between behavioral problems, social skills, speech language and communication skills and cognitive maturity and age among the children with autism spectrum disorder. In this study, the significance levels were accepted as .01 or .05.

Results

The study group comprised of 80 children (49 boys and 31 girls) between 10-16 years of age. Most of the children with autism spectrum disorder had mild or moderate autism disorder. Majority (38) of our children between 10-12 years had a total ISAA score from107 to 153 (moderate autism) while only 2 children had ISAA scores from70 to 106 (mild autism). In the second group, 37 adolescents had total ISAA scores within the range of107-153 (moderate autism) and 3 of them had ISAA scores within the range of70-106 (mild autism) (Table 1 and Figure 1).

Table1. Prevalence of adolescents according to ISSA scores

ISAA	10-12 years	%	14-16 years	%
< 69	0	0.00	0	0.00
between 70 - 106	2	5.00	3	7.50
between 107 - 152	38	95.00	37	92.50
> 153	0	0.00	0	0.00
Total	40	100.00	40	100.00

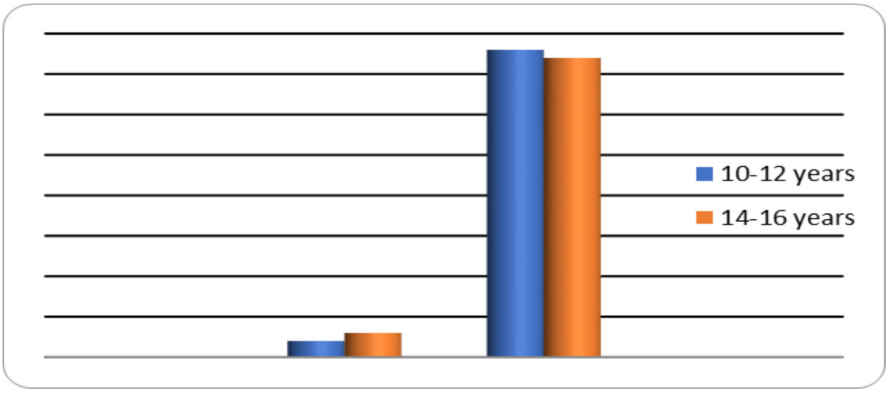

Figure1. Prevalence of adolescents according to ISSA scores

The results of the CBCL scores were portrayed on Table 2.Adolescents had higher overall scores for anxiety/depression (M=68.46), withdrawn/depressed (M=66.21), somatic complaints (M=58.52), social problems (M=72.14), thought problems (M=73.18), attention problems (M=72.48), rule-breaking behavior (M=59.74), and aggressive behavior (M=65.13) compared to preadolescents subjects. In this group the participants had lower overall scores of all domains of behavioral problems. The total scores for the CBCL were significantly different across the group ($F_{1,78}$=103.579, p=.000). The results were also found to be significant in all domains of behavioral problems with respect to age in subjects with autism spectrum disorder.

Table2. Means and standard deviations for CBCL scales by sample

CBCL Scale	**Preadolescents N=40 Mean(SD)**	**Adolescents N=40 Mean(SD)**	**F**	**p-value**
Total Score Anxious/	64.51(9.16)	72.85(9.65)	103.579	.000
Depressed	62.37(8.47)	68.46(8.76)	77.123	.000
Withdrawn/Depressed	64.21(8.52)	66.21(8.34)	77.418	.000
Somatic Complaints	56.12(7.89)	58.52(7.92)	92.146	.000
Social Problems	68.52(8.94)	72.14(9.82)	88.568	.000
Thought Problems	71.26(9.13)	73.18(9.84)	92.156	.000
Attention Problems	70.03(9.15)	72.48(9.24)	94.347	.000
Rule-Breaking Behavior	56.12(5.64)	59.74(5.98)	101.235	.000
Aggressive Behavior	52.13(5.67)	65.13(8.64)	105.324	.000

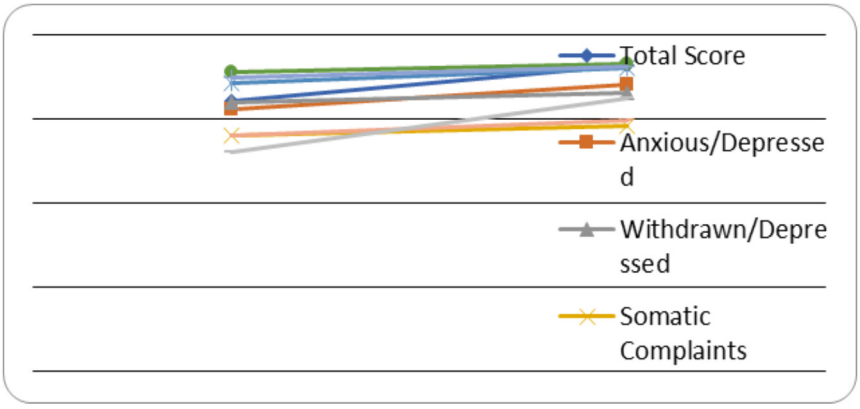

Figure2. The level of CBCL scales among adolescents

Figure 2 illustrates the overall scores for the level of behavioral problems among preadolescents and adolescents with autism spectrum disorder.

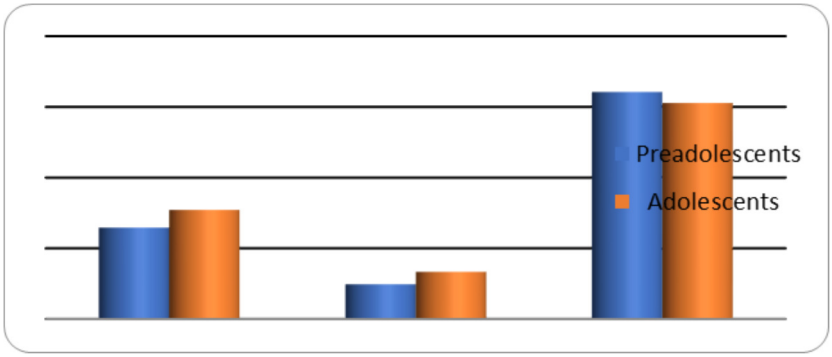

Figure 3. The level of social skills, cognitive maturation, speech language and communication among adolescents

Figure 3 illustrates the overall scores for the level of social skills, cognitive maturity, speech language and communication skills among preadolescents and adolescents with autism spectrum disorder. As one would expect, the subjects in the group of autistic adolescents had better cognitive maturity, speech language and communication skills than those in the group of autistic preadolescents. On the other hand, the mean CSQ score among preadolescents was M=64.32(SD=7.56), while the mean SCQ score among adolescents was M=56.40(SD=6.13).
Also, there was a positive and significant correlation between social skills and age ($r=.132$, $p<.05$), cognitive maturity and age ($r=.314$, $p<.01$), and speech language, communication and age ($r=.234$, $p<.01$).

Discussion

Autism spectrum disorder is a neurodevelopment disorder affecting at least one in thousand children. Although it is biologically based, with a strong genetic component, diagnosis of autism is still made by behavioral criteria: quantitative impairments in social and communicative development, with restricted and repetitive activities and interests (American Psychiatric Association, 1994; Wing, 1998).The impairments of

children with autism are particularly evident during social interactions, which will be confirmed by anyone who has been in close contacts with an autistic child. The impairments of children with autism are particularly evident during social interactions, which will be confirmed by anyone who has been in close contact with an autistic child.

Young persons with autism spectrum disorder are impaired in their social-emotional understanding and skills in a number of ways. A recurring element in this restriction is their failure to demonstrate social-emotional intelligence in practice. There seems to be a contrast between the relatively strong elementary knowledge of these subjects and their practical skills in various social-emotional domains. While the issue has been described by various researchers (Baron-Cohen, 1988; Kiln, 2000), it has rarely been the direct object of empirical studies.

Parents also tended to report that their 12-year-old children with autism spectrum disorder experienced negative emotions (i.e. sadness, fear, anger, shame and depression) more frequently than positive emotions (i.e. joy) (Tostada et al., 2011). Adolescents with autism spectrum disorder often experience stress and anxiety due to their difficulty to deal with change and unpredictable situations. They are also exposed to the risk of developing depression, especially in middle and late adolescence. Depression is more common among teens with autism spectrum disorder than teens without autism spectrum disorder. Because they often find it hard to understand and communicate their own feelings, these problems might not be picked up (Sigman & Hungered, 1984). Behavioural problems including self-injury and aggression are also common.

The aim of the present study was to assess the prevalence of behavioural problems, social skills, cognitive maturity, speech language and communication in preadolescents and adolescents with autism spectrum disorder. The results of the quantitative analysis revealed that there are significant differences between subjects in the period of preadolescence and adolescence. The scales on the CBCL were the highest, with mean scores exceeding 70 among the adolescents' samples. Therefore, the findings that behavioural problems were significantly more frequent among adolescents are consistent with the studies that reported that school-age children with autism spectrum disorder had highest scores for the anxious/depressed, social, thought and attention problems scales (Bolter et al., 1999). Hanger & Cooney (2005) reported a median score for the thought problems and aggressive behaviour scales, which was nearly identical to those in this study. Emerson et al. (2001) concluded that aggressive behaviour is prevalent in adolescents with autism spectrum disorder and the presence of the autism spectrum disorder phenomenology increase the risk of self-injury. Such behaviours put teens at risk for exclusion and isolation from social, educational, family and community activities.

The quantitative analysis of the present study showed that subjects with an autism spectrum disorder differ significantly in terms of social skills with respect to their age. Preadolescents with autism spectrum disorder had high scores on the SCQ than adolescents with autism spectrum disorder. Also, some researchers suggest that in terms of social maturity, adolescents with autism spectrum disorder are more rejected and less popular than children with autism spectrum disorder (Humphrey & Sykes, 2010); typically, they have fewer friends (Bauiuminger et al., 2003) and more limited social networks (Chawarska & Kolmar, 2005). Students with poor peer relationships are more vulnerable to social rejection (Wainscot et al., 2008). For the adolescents with autism spectrum disorder, negative social outcomes reduce the motivation for

further interaction, creating a pattern of avoidance and solitary behaviour that does not provide opportunities for the development of social skills.

On the other hand, adolescents with autism spectrum disorder had better language ability and cognitive maturity than preadolescents with autism spectrum disorder. Most of our subjects had home based and school-based treatments, and interventions for autism spectrum disorder can be overwhelming. They worked with an educational therapist who taught teach them new skills, how to act in social situations or how to communicate better with others (Dragon et al., 2001). However, a majority of research and pragmatic efforts to meet the needs of teens with autism spectrum disorder have focused on school-age children. As this population ages, families begin to plan goals beyond the secondary school years (Iovnannome et al., 2001; Gray, 1996).

In fact, for adolescents with autism spectrum disorder, as for all young people, education is vital, because during the education they become a complete person (Ekes & Ochoa, 2005). Participation in advanced educational programs becomes a significant source of their self-esteem. A way to foster independence and self-determination is to ensure that adolescents with autism spectrum disorder have the skills, attitudes and supports, to steer their own life in the ways that enhance their quality of life.

Conclusion

Adolescents with autism spectrum disorder have unique challenges that are often hard for their parents, teachers and peers to understand. While adolescence is a difficult time for most people, it is especially hard for young people who have autism spectrum disorder. Without the right support, adolescents with autism spectrum disorder retreat into themselves during this period. They express extreme loneliness, confusion, depression, aggression, low social and academic success.

As an increasing number of individuals with autism spectrum disorder is being diagnosed every year, it is important to address the topic of adolescence with them in mainstream schools. Transition programmes are designed specifically for this purpose, to ensure that children with autistic disorder are prepared to enter into adolescence with all required skills and strategies to be a successful person in today's modern society. Everyone is different in his or her diagnosis, strengths, needs, and wants. By starting the transition process early in school, all of these aspects can be taken into account and create a program that caters for them as individuals.

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