



Research Article

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## ***Comparing semi-autistic traits in parents of children with autism spectrum disorder and normal children's parents***

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### ABSTRACT

*The present study has been carried out by the aim of Comparing autistic like traits in parents of children with autism spectrum disorder and normal children's parents. This is a causal-comparative research. The statistical population of the study includes all the parents of children and adolescents with autism spectrum disorder under 18 years old in 2014. The number of 160 individuals of both parents (80 mothers and 80 fathers) of children with autism spectrum disorder have been selected and have been matched with 160 individuals of both parents (80 mothers and 80 fathers) of normal children regarding age, gender and economic condition. Child Symptom Inventory, parents' form (CSI, 1994) has been used to definite diagnosis of children's autism. Adult Autism Quotient Spectrum (AAQS, 2001) has been applied to assess parents' autism like traits. Research data analysis has been done using multi-variate analysis of variance, MANOVA and independent t-test. The research findings showed that parents of autistic children have more symptoms in general autism scale and deficiency in social, relational and imagination skill. But in sub-scales of attention to details and replacement, no difference has been obtained between two groups. Both mothers and fathers of autistic children have significant difference in general scale of autism and subscales of imagination and attention replacement. Such that autistic children's fathers reported more symptoms in general scale and subscales of imagination and attention replacement. But in subscales of social, relational skills and attention to the details, there was no difference between both fathers and mothers' groups. Based on the research findings, parents of autistic children have more autistic like traits and in comparison to mothers, fathers have more autistic like traits.*

**Keywords:** parents' autistic like traits, autistic children, normal children, autism spectrum disorder

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### INTRODUCTION

Autism is the child's inability to communicate with the people or situations. The term "autistic" refers to disable children in which a set of developmental disorders related to central neuron system are seen. Generally, there is agreement in this issue that autism is the most distressing irregularity in behavior. Usually, autism is considered as a psychological state which feature is severe withdrawn from the environment. Also, there is agreement in this issue that prediction of autism disease in a child is a very hard work. Deficiency in social interactions, relational and behavioral deficiency and limited and repeated interest are considered as the main three fold deficiencies of autism (Russell-Smith, Comerford, Maybery, Whitehouse, 2014). On the other hand, the studies indicated that high levels of autism like traits in people with autism spectrum disorders and its low levels are found in normal population (Wheelwright, Baron-Cohen, Goldenfeld, Delaney, Fine, 2006).

Domain and intensity of autism is wide. Some of these people could communicate with the people around them in high level and have good speech and acceptable intelligence. The other group have high verbal ability and pathology, but some are not able to speak. It may be that a child avoids eye contact or it seems that he is deaf. Also, his language development and social skills have been stopped (Kakavand, 2009).

As autism like traits could be presented as a spectrum and lighter symptoms of autistic disorder, so spectrum approach has removed diagnosis from a cluster and directed toward a quantitative approach (Baron-Cohen, Wheelwright, Skinner, Martin, Clubley, 2001). Therefore, autism like and schizotypal traits could be described as dimensions of normal personality that is border of their pathologies are respectively autism spectrum disorders and psychosis spectrum disorders. Such a spectrum approach has removed diagnosis from a cluster and directed toward a quantitative approach and of course it also could be supplement of cluster approach. Regarding the approach of trait and quantification for autism, it could expect that in this field there are individual differences and some may have more or less autism like traits (Khanjani et al, 2013). According to this orientation toward autism disorder, it could mention it as autism like traits that are used in more understanding autism disorder.

Previous studies show that children with psychological disorders have parents that suffer from much more psychological disorders (Gottesman, Laursen, Bertelsen, Mortensen, 2010; Dean, Stevens, Mortensen, Murray, Walsh, et al, 2010; Singh, DelBello, Stanford, Soutullo, McDonough-Ryan, et al, 2007) have more stress toward job and spouse loss before child's birth (Beverdors, Manning, Hillier, Anderson, Nordgren, et al, 2005). Considering the approach of studying trait in autism spectrum disorder and also regarding previous research on the prevalence of psychological disorders in parents of children with psychological disorders, it seems that autistic children's parents though may not have autism disorder, they have more autistic like traits. As it has been reported, people with high scores in these traits, though being in normal spectrum of the society, have some similar characteristics with those with autism (Baron-Cohen, 2010). On the other hand, as autism disorder is largely considered inherited; therefore, autism like traits could also be largely inherited and show average non-common environment delays (Hoekstra, Bartels, Cath, Boomsma, 2007; Chaste, Leboyer, 2012).

Though manifestation aspects of autism disorder in parents with autistic children for diagnosis of autism disorder is not clear; regarding biological approaches, it could be expected that autistic like traits in parents of autistic children is different from the others. Also, from systemic theory perspective to the family, behavior of each one of family members (especially parents) leads to an effect on the behavior of other family member (especially children), so the presence of any psychological disorder in parents leads to an influence on children and even their affection to psychological problems (Bjornstad, Montgomery, 2005). In this regard, research shows that mothers of those children with autism spectrum disorders have more depressive mood, parenting stress, broader autism phenotype in comparison to mothers of those children without autism spectrum disorders (Ingersoll, Meyer, B ecker, 2011).

Piven, Wzorek, Land, Iainhart and folstein (1994) in examination of personality traits of parents of autistic like people have found that personality characteristics like aloof, untactful, undemonstrative, unresponsive traits in parents of autistic children are observed more than normal children or those with Dawn syndrome children's parents. Also, findings of Gray (2002) showed that mothers of children with broader autism disorders are more susceptible than fathers in confrontation with the events and in order to cope with their children's inability use different strategies. Konstantareas, Homatidis (2005) indicate that feeling of anger and request to the spouse's help is more observed in mothers of autistic children than the normal ones. The presence of genetic signs in parents and autistic children could be one of the social and biological reasons in the presence autistic like traits in parents of autistic children, as the previous research show that genetic factor is considered as one of the risk factor of affection to autism (Thompson, Kemp, Wilson, Pritchett, Minnis, et al, 2010; Petit, Plessis, Decamp, Cuisset, Blyth, et al, 2014).

**Table 1.** Mean, standard deviation of autism like traits in parents of autistic children and normal children's parents

Subscales of autism like traits	Normal group parents				Parents			
	Mean	Standard deviation	Skewness	Kurtosis	Mean	Standard deviation	Skewness	Kurtosis
Social skill	3.08	1.62	0.20	-0.72	3.95	1.63	0.52	-0.03
Communication	2.32	1.46	0.75	0.51	2.93	1.56	0.90	1.07

imagination	3.60	1.52	0.20	0.16	4.21	1.54	0.01	1.03
Attention to details	5.21	1.69	-0.13	-0.53	5.43	1.54	-0.30	-0.11
Attention replacement	5.58	1.46	-0.31	-0.29	5.73	1.89	-0.47	0.11
Total scale	19.81	3.36	-0.23	-0.77	22.27	4.14	0.02	-0.11

**Table 2.** Mean and standard deviation of autism like traits in mothers and fathers of autistic children and normal children's mothers and fathers

Subscales of autism like traits	Mothers of autistic children		Fathers of autistic children		Mothers of Normal children		Fathers of normal children	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Social skill	3.62	1.42	4.27	1.78	3.10	1.48	3.07	1.77
Communication	2.75	1.39	3.12	1.71	2.35	1.51	2.30	1.43
imagination	3.77	1.38	4.65	1.59	3.57	1.64	3.62	1.40
Attention to details	5.47	1.60	5.40	1.51	5.15	1.67	5.27	1.73
Attention replacement	5.20	1.72	6.27	1.92	5.67	1.45	5.50	1.48
Total scale	20.82	3.89	23.72	3.92	19.85	3.54	19.77	3.22

In order to general analysis and answer this research question that if autistic like traits in parents of children with autism and normal children are different or not, MANOVA is used.

**Table 3.** Results of multiple tests

Value		F-value	Hypothesis of FD	Error of FD	Level of sig.
Wilcox Lambada	0.87	4.22	5	154	<0.001

Based on the results multivariate test of Wilcox Lambada, the value of Wilcox Lambada is a number between zero and one that the more it is closer to one, it indicates that the test result is significant. As it is represented in Table 3, the value of Wilcox Lambada is 0.87 and F value is 4.22 in the level of significance is less than 0.001 of error. Regarding the level of significance of less than 0.01, so there is significant statistical difference between both groups of parents of autistic children and control group in comparing variables.

Heritability for autism spectrum disorder has been estimated based on the rate of twins public percent that this genetic transfer is largely as multi genetic (DSM-5, 2014). Therefore, autism is probably heredity of autism like traits of parents in which it is manifested lower in adults. So, it is probable that these parents had clear autism symptoms in their childhood, but as their age increased, the symptoms decreased in them, of course the groups that did not have mental disability and normal intelligence.

In adulthood, deficiencies are in mutual behaviors of social- emotional ones in processing problems and answer to complex social signs for example when and how it connects to a dialogue and what to say and what not to say. The same adults have grown compensatory strategies for social challenges in themselves.

However, in new situations they try with or without help and suffer from continuous attempt and anxiety of evaluation of what is intuitive for most people regarding social terms. Also, these parents that have clear language, but the problem of coordinating non-verbal, communication with speech. They may have strange or exaggerated body language processing or while interaction. Probably they have similarly good eye contact but have problem in proper integrating of eye contact, movements, hint, gesture, and face manifestations for social communications (DSM-5, 2014) However, these features in parents of autistic children show well that there are sub-threshold signs of autism like symptoms in them that are not considered by others because of these signs being poor. Therefore, there is high probability that in face autism, it is transferred through heredity to children. Also, it is reported that parents of autistic children have more probability of experience to psychiatric hospitalization and schizophrenia disorder in both parents of autistic child, but depression as a personality disorder in mothers of autistic children but not fathers in comparison to normal children ones is more. Also, Larson et al (2005) also showed that risk of affection to autism in parents with schizophrenia and mood disorders is more.

Though several features of autistic children's parents like psychological health (Riahi and Iizadmazidi, 2012), mother's stress (Herring, Gray, Taffe, et al, 2006), and personality characteristics (Yamad, Suzuki, kato, et al, 2007, Jokiranta, Brown, Heinimaa, et al, 2013) have been examined, but regarding autistic like traits of autistic children's parents there are less research. Therefore, examination of autistic like traits in autistic children's parents will help to better understanding of psychological pathological dimensions of parents' members of autistic children, based on this, the present research has been conducted by the aim of comparing autistic like traits in parents of autistic and normal children.

### **Methodology:**

The present research is causal-comparative. Regarding its purposes, it is applied research and regarding time period of performing research is cross-sectional.

The population includes all the parents of children and adolescents under 18 years old with autism spectrum disorder in 2014 in Tabriz who are under the cover of well-being organization. Based on the present information, the number of 150 children and adolescents are under the support of well-being organization of East Azerbaijan province. Also, to select statistical sample for control group, statistical population of governmental schools have been used.

The method of sampling is on hand and considering parents' satisfaction to participate in the research among autistic children and adolescents educational and service support center, so by requesting cooperation from all the statistical population, the number of 80 parents (fathers and mothers) were ready to participate in the study and enter the research by fulfilling the questionnaire.

The method of sampling for control group (normal children) was simple random sampling and were selected from schools and classrooms students under 18 years from boys and girls. So, 160 people included in the sample group involving 80 normal parents and 80 autistic children.

### **Research instrument**

In this study, in order to collect data two test including child symptom inventory.

-4 parents' form and teachers' form and adult autism scale have been used.

#### Child symptom Inventory – 4 (CSI- 4):

This scale has been designed by Spirafkin and Godoo (1994) and based on DSM- III and in order to screen behavioral and emotional disorders of children 5-12 years and in 1994 at the time of publishing DSM-IV it has been revised. This scale has two forms of parent – teacher that is answered based on the scale of 4 Lickert degree. Parent form has 97 items and has been formulated to diagnose 18 behavioral and emotional disorders and teacher form that has 87 items, has designed to diagnose 13 behavioral and emotional disorders. In this regard, Spirafkin and Gado (Mohammad Ismail, 2002) have estimated reliability of this scale using retest around 0.70 to 0.90 in their study on 36 children with emotional disorders.

In order to study reliability and validity of this test, it has been shown that sub-scales of this scale has reliable psychometric indexes to measure ADHD symptoms. Besides, reliability of this test has been reported good based on the studies related to the content reliability, such that reliability for both forms of parent and teacher has been estimated as 0.90 and 0.93 respectively. In this study both parent-teacher forms and the items 72 to 83 related to autism disorder have been used.

CSI-4 test is of those scales that have features like simplicity and performance simplicity. This test allows that by obtaining advantage information about the kind and severity of illness symptoms of behavioral- mood- cognitive of children and adolescents with behavioral and emotional problems, enough information resource will be achieved (Mahamood Ismail, 2002). Though autism children were diagnosed by psychologist before entrance to the center of education and support service for children and adolescents with autism, there is psychological file, but to be sure of accurate diagnosis, in this study autism sub- scale of CSI- 4 has been used to diagnose autism disorder in the sample under study. To do so, cut score of 6 and higher (based on scale manual) is considered as the criterion of affection to autism.

#### Adult autism Quotient Spectrum scale (AAQS):

AAQS has been made by Cohen, Baron, Wheelwright, skinner, Marin, Clubley (2001). AAQS is a self-report instrument and has 50 items that evaluate preferences and personal habits. AAQS has 5 sub-scales and each sub- scale has 10 items that are answered on the scale of Likert degree. Sub-scales include social skill (SS), communication (Co), imagination (Im), attention to details (AD), attention replacement. Persian copy of AAQS has been translated by Pouretamal et al (2014). Internal consistency of AAQS has been reported by Cronbach Alpha method in the students of normal population from 0.52 for attention replacement to 0.76 for attention to details. Reliability by retest for total scale has been reported 0.78 (Hoekstra et al, 2007). Validity of diagnosis for AAQS in separation people with Asperger syndrome from those without Asperger has been confirmed (Baron-Cohen et al, 2001).

In Khanjani et al (2013) research, simultaneous reliability of AAQS with SPQ has been reported 0.35.

#### Findings:

In Table 1, mean, standard deviation and results of skewness and kurtosis of scores of total subjects have been represented. In Table 2, mean, and standard deviation of fathers and mothers' scores of autistic children with autistic like traits have been represented.

**Table 4.** Results of ANOVA table of between group effects

Subscales of autism like traits	Variable	Sum of squares	DF	Mean of squares	F value	Level of sig.
group	Social skill	29.78	1	29.75	11.18	<0.001

	Communication	15	1	15	6.54	0.01
	imagination	15	1	15	6.36	0.01
	Attention to details	2.02	1	2.02	0.76	0.39
	Attention replacement	0.90	1	0.90	0.31	0.57
	Total scale	242.55	1	242.55	17	<0.001

Based on the results of Table 4, 6×2 ANOVA and results of effects of between group, F value resulted from analysis in scores in both groups of parents of autistic children and control in total scale and three sub-scales (social skill, communication, imagination) are in significance level of less than 0.05 error. So, there is significant statistical difference between two groups of autistic children's parents and control group in total scale and three sub-scales (social skills, communications, and imagination) ( $P<0.05$ ).

Such that based an autistic children's parents have more scores in total AAQS and symptoms of social skills, communication, and imagination. But in sub-scales of attention to details and attention replacement, there is no difference between both groups of parents of autistic children and normal children.

In order to general analysis and answer to this question that if autistic like traits in fathers of autistic children is different from mothers or not, MANOVA has been used.

**Table 5:** results of multiple tests of Wilcoxon Lambda

Value		f-value	Hypothesis of FD	Error of FD	Level of sig.
Wilcoxon Lambda	0.83	2.95	5	74	0.01

Based on the results of multi-variate test of Wilcoxon Lambda, Wilcoxon Lambda value is 0.83 and F value is 2.95 in the level of significance less than 0.01 error. Regarding the level of significance of less than 0.01, there is significant statistical difference between two groups of mothers and fathers of autistic children in comparing variables (Table 5).

**Table 6:** results of ANOVA table of between group effects

Subscales of autism like traits	Variable	Sum of squares	DF	Mean of squares	F value	Level of sig.
group	Social skill	8.45	1	8.45	3.24	0.07
	Communication	2.81	1	2.81	1.15	0.28
	imagination	15.31	1	15.31	6.86	0.01
	Attention to details	0.11	1	0.11	0.04	0.83
	Attention replacement	23.11	1	23.11	6.92	0.01
	Total scale	168.20	1	168.20	11	0.001

Based on the results of 6×2 ANOVA Table and results of between group effects, F value resulted from analysis for total scale and sub scales of imagination and attention replacement is in the level of significance less than 0.05. Considering the level of significance of less than 0.05, so mean scores for fathers and mothers in total scale and sub scales of imagination and attention replacement, there is statistical difference. Such that based on mean scores, fathers of autistic children report more symptoms in total scale and sub scales of imagination and attention replacement. But in sub scales of social skills, communication, and attention to details, no difference is seen between both groups of fathers and mothers (Table 6).

### Conclusion and Discussion

Findings of the present research showed that there is significant difference between normal children's parents and autistic ones regarding autistic like traits. Examination of means of both groups indicated that autistic children's parents get more scores regarding autistic like traits than normal children (social skills, communication ability, imagination, and total traits of autistic like). This finding of the research is consistent with Ingersoll et al (2011). This study emphasized on the presence of more broad autism phenotype in mothers of children with autistic spectrum disorder than those mothers of children without disorder. Research by Kozlowski et al (2012) is also consistent with the present study. This research showed that there is much more biological relation between autism diagnosis in family with autism symptoms in childhood. Also, the research by Tajmiriahi et al (2013) showed that parents of autistic children have poor mind reading in comparison to normal children's parents (control) and the performance of mind reading in face is poorer than voice mind reading.

It seems that autism could be heredity of autistic like traits of parents that have more severe phenotype than parents and some traits autistic like traits of parents have much more common points with signs of children's autism. The presence of genetic sign in autistic parents and children could be one of the social and biological reasons in the presence of autistic like traits is more in autistic children parents, such that the previous research show that genetic factor is considered as one of the risk factors (Thompson, Kemp, Wilson, Pritchett, Minnis, et al, 2010; Petit, Plessis, Decamp, Cuisset, Blyth, et al, 2014).

Therefore, autism is probably heredity of autism like traits of parents in which in adults it is manifested lower. So, it is probable that these parents had clear autism symptoms in their childhood, but as their age increased, the symptoms decreased in them, of course the groups that had not mental disability and normal intelligence. In adulthood, deficiencies are in mutual behaviors of social-emotional ones in processing problems and answer to complex social signs for example when and how it connects to a dialogue and what to say and what not to say. Some of these adults have grown compensatory strategies for social challenges in themselves. However, in new situations they try with or without help and suffer from continuous attempt and anxiety of evaluation of what is intuitive for most people regarding social terms. Also, these parents that have clear language, have the problem of coordinating non-verbal communication with speech. They may have strange or exaggerated body language processing or while interaction. Probably they have similarly good eye contact but have problem in proper integrating of eye contact, movements, hint, gesture, and face manifestations for social communications (DSM-5, 2014). Consistent with this explanation Jokiranta et al (2013) showed that children's autism spectrum disorder are observed more in parents who have personality disorders and also are higher in psycho-neurotic factor. Also, Larson et al (2005) showed that the risk of affection to autism in parents with schizophrenia and mood disorder is higher.

One of the findings of the research showed that autistic children's parents had no difference in sub scales of attention to details and attention replacement in comparison to normal children's parents.

Considering the existing knowledge in relation to autism and risk of factors of affection to that about the presence of autism quotient and deficiency in traits of social skills, communication, imagination in parents of autistic children's parents, it is inferred that the presence of genetic similarity in parents and children could be of possible and biological reasons in the presence of more traits of autistic like in autistic children's parents (Thompson et al, 2010; petit et al, 2014).

Generally, the above finding implicates the presence of more autistic like traits in autistic children's parents.

In this regard, research by Kozlowski, Matson, and Worley (2012) in an examination of the effect of diagnosis of family autism spectrum disorders on autism symptoms in children showed that there is much more biological relationship with diagnosis of family autism on autism symptoms in children.

The other finding of the study indicated that fathers and mothers of autistic children have significant difference with each other regarding autistic like traits (total scale).

Such that fathers suffer more than mothers of autistic children, suffer from autistic like traits.

Based on the theory of extreme male brain theory of autism (EMB), that is used in explanation of autism, the observed profile in autism spectrum disorders is ultimate of what is seen in normal men. Also, autism personality is final formal of masculine intelligence.

In autistic like individual, there is sever masculine pattern and ultimate one. These hypotheses have been confirmed by some studies (Baron- Cohen, 2010). It has been reported that normal men in comparison to normal women are superior in spatial tasks and performance of those with autistic spectrum disorder is better than normal men performance.

In tasks like embedded figures test, normal men in comparison to normal women evolve with less speed and autistic children have more delay in comparison to normal men.

Also, normal men in comparison to normal women are social.

Evolution with less speed and speed of autistic children's social evolvment speed is lower than normal men. Normal women are superior in tasks of mind reading than normal men and people with autism spectrum disorder have sever deficiency in mind reading.

Parents of autistic children or those Asperger that are estimated to have that genotype of their children, have high spatial ability and mind reading deficiency.

Indeed, system in them is also observed as masculine pattern (Tajmiriahi, Nejati, Pouremad, and Mansouri sepehr, 2013).

The other study indicates that normal men in comparison to normal women have smaller Corpus Callosum and in people with autistic spectrum disorder, size of Corpus Callosum is smaller than its size in normal men. Left- handed in men is common and presence of left handedness in people with autism spectrum is more.

Emergence of left handedness in autism is reported 18% to 22%. In normal population men's brain is heavier than women's and brain of people with autism is heavier than men's.

In normal population, men deal with mathematic, mechanics, spatial jobs more than women. It has been reported that children with autism spectrum disorder do also have such jobs (Gardner, Spiegelman, Buka, 2009).

The other part of research finding showed that fathers of autistic children have more deficiency than mothers in two traits i.e. imagination and attention replacement and in three traits of social skills, communication, attention to details, there is no significant difference between them. It is necessary to mention that fathers of autistic children are higher in some autistic traits and necessarily they are not higher in all of them.

In other words, it may be that in some of them, they may be higher and in some other they may not have clear difference with mothers. Based on this, it seems that autism is observed as superficial traits in normal population. These traits that are similar to autism symptoms, include social skills, attention to details, attention replacement, communication, imagination. People who get higher score in these traits, though being in the normal spectrum of population, some have similar features with those with autism spectrum disorder.

This issue is not necessarily bad.

Fathers of autistic people prefer some jobs like computer engineering and other numerical fields and technical ones (Baron- Cohen, 2010).

It may be that a little bit of autism is good, as autism people have deficiencies, may also have some strengths. Besides servant ability, the other abilities of autism people are that could pay attention to details and see them apart from each other. These people have good performance in ordering and organizing information well.

Relatives of autistic people may have some of these abilities without some special autism deficiencies. Or they have autistic drawbacks a little (Baron Cohen et al, 2001).

Generally, based on the findings of the research, it is inferred that there should not be any ignorance toward inefficient psychological features of parent in children's autism disorder especially parents' autistic like traits.

Therefore, combination of biological and psychological factors could be helpful approach in better understanding and also next scientific orientation for more accurate understanding of autism disorder in children (Chaste, 2012). Proportional to this approach, attention to biological issues besides psychological–biological interaction explanation could be helpful in recognition and studies related to theoretical development for intervention programs.

Findings of each research could be applied regarding its limitations.

In this regard, use of self- report instrument of questionnaire, autistic children under the cover of Tabriz well-being organization is of the limitations of the present research that implicates the importance of complementary researches. Based on the study findings, it is recommended that behavioral interventional programs to be used for parents and especially autistic children's fathers that the problems related to their autistic like traits does not influence other family members.

It is recommended that before marriage, consulting should be done and this issue should be proposed as a requirement for families and youth, so to be informed of any psychological test or reports of the people themselves in the interview indicate the presence of autistic like traits, firstly family marriages should be avoided and secondly the person himself should be encouraged to be consulted to get needed training for social skills and communications to decrease the severity of his problems after marriage.

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