Original Article

The role of developmental indicators and theory of mind in predicting the general functioning of children with autism spectrum disorder

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Abstract

The aim of the present study was to investigate the role of developmental indicators and theory of mind in predicting the general functioning of children with autism spectrum disorder. The method of this research was descriptive and correlational. All 4-14-year-old autistic children living in Tabriz city in the winter of 2021 formed the population of this study, of whom 110 people were selected by convenience sampling and formed the sample. To collect the, the questionnaires of Stirenman's theory of mind, Gilliam's autism diagnosis (2nd edition), Ulrich's motor development and Greenspan's functional emotional development scale were used to evaluate children's general functioning. The data was analyzed using Pearson correlation tests and multiple regression analysis. The results showed that the total score of the emotional development index, the total score of the motor development index of object control, and the motor development index of displacement have a significant positive relationship with the overall functioning of children. Developmental indices and its subscales and theory of mind and its subscales explained 0.67 of the variance of children's overall functioning. Based on the findings of the research, developmental indicators and theory of mind can predict the overall functioning of children with autism spectrum disorder; therefore, by training and strengthening the theory of mind and carrying out interventions related to developmental indicators, the overall functioning of these children can be improved.

Introduction

Autism spectrum disorder is a neurodevelopmental disorder with symptoms of social interaction, communication, and repetitive and stereotyped behaviors, currently reported to have a prevalence of about 1 in 59 children (Baio et al., 2018). Autism spectrum disorder symptoms can be defined in two main categories: behavioral deficits (for example, deficits in communication, social and playing skills) and additional behaviors (for example, aggression, self-injury and repetitive behaviors, self-stimulating behavior, bullying) (Leekam et al., 2011). People with autism spectrum disorder have problems in taking the lead in interactions, sharing pleasure, maintaining eye contact, two-way conversation, considering others' points of view, and inferring the interests of others. In addition, living independently, developing friendship networks, verbal reasoning, understanding the emotions of others, professional preparation, and designing and implementing shared assignments are among the major challenges of people with this disorder (Mousavi et al., 2019).

Overall functioning measures the highest level of social, occupational and psychological functioning of the patient (American Psychiatric Association, 2013). People with autism have many problems in the functioning of motor (Morris et al., 2015), perceptual (Fournier et al., 2010), balance (Liu & Breslin, 2013), attentional (Jepsen & VonThaden, 2002), executive (Chan et al., 2009) issues. Disturbance in functions and social skills is the most well-known and essential feature of autism disorder (Williams White et al., 2007) and it can be said that it is the most stable feature of this disorder from childhood to

adulthood (Beadle-Brown et al., 2006). American Psychiatric Association (2013) disorder in multiple non-verbal behaviors, inability to communicate with peers in a way appropriate to the level of development, failure to share others' interests automatically and lack of emotional and social interaction of autistic people as symptoms of the disorder. Social introduces. Disruption in the functioning of developmental language (Tager-Flusberg et al., 2005), inability to understand social and emotional stimuli (Tine, 2009), executive and inhibitory functions (Hill, 2004) are also other disorders in the general functioning of people with autism.

One of the variables that is likely to be able to predict the overall function in people with autism spectrum disorder is the theory of mind (Doherty, 2009). It can be said that the two main abilities that distinguish humans from other species are theory of mind and language. In fact, it would be strange if humans could not have collective communication with each other (Doherty, 2009). The ability to understand and attribute mental states including tendencies, knowledge, desires to oneself and others is called theory of mind (Mashinchi et al., 2013). These mental abilities have a fundamental role in social and communication interactions and provide the possibility of successful and two-way exchange of information between people (Ahmed & Miller, 2011). Actually, the theory of mind is like a capacity consisting of two cognitive and emotional components. The cognitive component is the ability to identify the opinions and contributions of others, and the emotional component is the ability to empathize with the emotional states of others (Bodden et al., 2010). The problems of autistic children in the field of social interaction with others remained a mystery until in 1985, Baron-Cohen considered the problems to be the result of defects in the theory of mind of these children. He defined the theory of mind as an ability in humans. The ability to predict and explain our own behavior and that of others, and to do this we refer to mental states such as desires, beliefs, perceptions, emotions, etc. (Doherty, 2009).

Ghadiri and Soleimani (2019) in a research titled "Building an Executive Functions Training Program and Investigating Its Effectiveness on Improving Theory of Mind in Children with High Functioning Autism Spectrum Disorder" found that by improving executive functions, theory of mind levels can be increased.

Also in a study titled "A Longitudinal Study of Executive Functioning and Theory of Mind Development in Autism" (1994), Uzonoff and McEvoy (1994) showed that both executive functioning and theory of mind in autistic individuals were severely deficient or progressed slowly during development and it may never reach a normal level of function and seem to eventually stop growing. Among the other variables that are likely to be able to predict the overall function in people with autism spectrum disorder are growth indicators (Happé & Frith, 2006). The results of the studies have shown that movement disorder is one of the prominent features of autism and Asperger's (Coury, 2010; Happé & Frith, 2006). As the presence of gross motor deficits and

coordination deficits and degrees of clumsiness, poor, unskilled and crude coordination have been shown in autism spectrum disorder (Gupta & Singhal, 2005; Happé & Frith, 2006; Mandell et al., 2009) 50% of Asperger's samples and 67% of high-functioning autism samples had movement disorders (Mulligan & White, 2012). For example, Berkeley et al., (2001) examined motor skills and object control in 15 children (10 boys and 5 girls) with high-functioning autism aged 6-8 years; According to the report of this study, 80% of children with high functioning autism are classified as weak and very weak. Another study conducted by Staples and Reid (2010) compared children with autism spectrum disorder (age range 9-12 years) with three groups of typically developing children (i.e. children with the same chronological age, same motor skills and and the same mental age) and the results showed that in both motor and object control tests, the scores of children suffering from autism disorder were significantly (16%) lower than children with the same chronological age and the same mental age.

Arjomand and Alipourshojaei (2016) in a research entitled "Examining the analysis of social functions in autistic people and providing new solutions to increase social skills in autistic children" reached the conclusion that autistic children have weaker executive functions than normal children. In autism spectrum disorders, recognition, expression of emotional states and facial processing are associated with deficits. Deficits in social cognition cause problems in understanding one's own and others' states and emotions, and deficits in social functioning cause problems in starting, creating, maintaining and Development of positive social relationships and difficulty in interacting with others.

Parhun (2018) in his research entitled "Communication and Perceptual-Motion Problems of Children with Autism Spectrum Disorder" showed that continuous deficiency in social skills is one of the prominent characteristics of autistic children. Difficulty in establishing social communication in the form of destruction of two-way emotional-social relationships, lack of normal two-way conversation, reduction of sharing one's interests, emotions or feelings with others, or inability to initiate or respond to social interactions, defects in non-verbal communication behaviors, weak coherence of verbal communication and non-verbal, the inability to make friends and participate in imaginary games is revealed.

According to what was given in this background of studies about developmental indicators and theory of mind in predicting the overall functioning of children with autism spectrum disorder, no study was found that investigated the relationship of these variables simultaneously. In most studies, the relationship between these variables has been shown in detail. Therefore, taking into account this study gap and the key role of these structures in children with autism spectrum disorder, the present research has investigated the role of these factors in predicting the overall functioning of children with autism spectrum disorder.

Method

Participants

The population of the study consisted of autistic children between 4 and 14 years old living in Tabriz city in 2013, who visited three daily rehabilitation and educational centers in Tabriz, including Raha Rehabilitation Center, Roshd Rehabilitation Center, and Sara Rehabilitation Center. The sampling method was convenient. Considering that the current research is correlational and the minimum sample size in this type of research is 30 people, a sample size of 156 people was selected from among all the patients with high-functioning and educable autism spectrum disorder who were conducted during the research in the aforementioned centers. Finally, due to the incompleteness of some questionnaires and the loss of samples, 110 people remained in the research process. The presence of diagnosis of autism spectrum disorders and being educable were the entry criteria, and not having the desired age criteria, the incompleteness of the questionnaires, the child's lack of cooperation, and the parents' lack of satisfaction were the exit criteria of this study.

Instrument

Researcher-made personal profile form:

A researcher-made form was used to collect demographic information, which included the child's age and sex, education, parents' age, and the number of siblings. In addition, the ethical considerations of the research (the confidentiality of their names and information) and the purpose of the research were explained at the beginning of the form.

Steerneman theory of mind test:

The 38-item theory of mind test was developed by Stirenman (1999). The main form of this test is to measure the theory of mind in normal children and children with pervasive developmental disorder aged 4 to 12 years and information about the range of social understanding, sensitivity and insight of the child, as well as the degree to which he is able to understand the feelings and thoughts of others. accepts, provides. Qomrani, Alborzi & Kheir, 2015 modified the desired test. They reduced the number of test questions from 72 to 38 and used Persian names instead of foreign names. In this test, subjects can get a score between 0 and 20 in the one-point subscale, in the two-point subscale between 0 and 13, and in the three-point subscale between 0 and 5, and in the whole test, get a score between 0 and 38. From the sum of the above three subscales, a total score for theory of mind is obtained. The higher this score is, it indicates that the child has reached higher levels of theory of mind. These researchers estimated concurrent validity through the correlation of the test with the doll's house task at 0.89, which was significant. The correlation coefficients of the subtests with the total score of the test also varied between 0.82 and 0.96 in all cases. Retest reliability varied between 0.70 and 0.94 and all coefficients were significant at the (α=0.1) level. The internal consistency of the test was calculated using Cronbach's alpha for the whole test and each of the subtests, respectively, 0.86, 0.72, 0.80, and 0.81. Also, the reliability coefficient of the scorers was 0.98 (Qomrani et al., 2015).

Children Global Assessment Scale (CGAS):

This scale was created to evaluate children using the general performance scale, and its characteristics are similar to the adult questionnaire (Shaffer et al., 1983).Using this tool, the doctor needs to collect information from previous assessments and interviews with the child, parents and school teachers. Then it is evaluated on a scale of 0 to 100 and divided into categories. Ratings can be in ten-point increments or as an actual score (eg 53). In this questionnaire, the following score ranges are defined: 0-10: very weak (24-hour care), 11-20: very weak, 21-30: severe problems, 31-40: serious problems, 41-50: Obvious problems, 51-60: some noticeable problems, 61-70: some problems, 71-80: doing right, 81-90: doing well, 91-100: doing very well. This scale is designed for children and youth under 18 years of age and is completed by physicians.
CGAS modified for use in children with developmental disabilities (DD-CGAS). The inter-examiner reliability is between 0.53 and 0.91 and the test-retest reliability is 0.85 (Blake et al., 2007). In this research, CGAS questionnaire will be used for people under 16 years old.

Gilliam's Autism Diagnostic Test-Second Edition (SE-GARS):

This test was designed and built to rate the severity of the disorder in people with autism spectrum disorder. This test includes three subscales of stereotyped behaviors, communication and social interactions. Each subscale consists of 14 options; each option is graded from 0 to 3 based on severity. The scores of each subscale are added together and converted into standard scores. Based on the sum of the standard scores of the 3 subscales, the severity of the disorder can be determined as follows: if the child's score is 52 or less than 52, the child has a low probability of having an autism disorder, if the child's score is between 53 and 84 obtained, the probability that the child has an autism disorder is moderate, and if the child's score is 85 or more than 85, the child has severe autism. In Iran, this test has been modified for 3-18 year olds and Cronbach's alpha coefficient is estimated at 0.89 (Ahmadi, Safari, Hemmatian and Khalili, 2011).

Ulrich's motor development test

This test is one of the valid tools for measuring the growth of children's movement skills. For the first time, Ulrich prepared this tool based on basic motor skills and reported it for American children aged 3 to 14 years

(Venkadesan & Finita, 2010). Its validity is 0.96 and its reliability for small tests is 0.87. Also, the validity and reliability of this test has been confirmed by Zarezadeh et al. (2009) in the country. This test has two sub-scales of movement and object control, each of them has 6 movement skills (running, lee, gallop, hiccups, long jump and jumping) and 6 object control skills (throwing, dribbling, receiving, kicking, throwing). and the ball is rolling). This test has two main raw scores that are related to subtests. The score of the performance criteria of each skill is added to obtain the raw score of each skill; Then, by adding the raw score of the skills related to each sub-test, the raw score of the corresponding sub-test is obtained. The full score of each subtest is 48. For interpretation, the raw score of the sub-tests is converted to the standard score of the sub-tests, gross motor interest and percentage rank through normative tables. The scores of each sub-test are between 0 and 24. The score of 12 is the cut-off point, the scores below 12 indicate that the sub-test is low and the scores above 12 indicate that the sub-test is high. The standard score of the sub-tests and gross motor interest are actually standardized scores, the mean and standard deviation of the first distribution are 10 and 3, and the second is 100 and 15, respectively.

Greenspan functional emotional development questionnaire

This questionnaire has 35 items that outline the developmental profile of children in the past two levels of the circuit (0 to 3.5 years old) and the current situation. Mothers first score the questions for the past level of the circuit in forms graded on a Likert scale using 6 options (can't say, never, sometimes, on average, mostly, and always). Therefore, scoring varies from zero to five. In the second step, all the questions for the current state of the child in 4 levels (does not show this behavior yet, sometimes shows this behavior, always shows this behavior, shows this behavior, has this behavior but when stress or does not show anxiety) are scored from one to four. Greenspan and Degangi (2001) reported the validity coefficient of this questionnaire as 0.89 to 0.91 and the reliability coefficient using the internal consistency method as 0.90. The validity of this test in internal studies was first reported by Karimian (2013) using the age discrimination method, and Cronbach's alpha coefficient was 0.94. Also, Mofrad (2013) used construct validity in the method of internal consistency, and all subscales of the questionnaire had a high and significant correlation with the total score of the test, and Cronbach's alpha coefficient was reported as 0.89. Cronbach's alpha coefficient was investigated in this study and obtained for the whole scale was 0.72. The reliability of this tool was reported in Karimian's study (2013) with Cronbach's alpha coefficient of 0.94.

Procedure

After receiving the necessary permissions to conduct research in the mentioned centers, coordination with the center managers and setting the time was done and then the information was collected. After parents answered the individual profile form, they were asked to complete the Gilliam Autism Diagnostic Test-2nd Edition and the Greenspan Emotional-Functional Developmental Inventory about their children. The questions and how to answer them were fully explained and the ambiguities in the files were resolved. Ulrich's motor development test was conducted and graded by the researcher in cooperation with the trainers of the mentioned centers. Each set was completed specifically for each child, and finally Steerneman's theory of mind test was administered by the researcher. In all the tests, the child's age and level of understanding and familiarity with the Turkish or Persian language were taken into consideration and the test was taken according to the conditions of each person. All ethical principles are considered in this article. The participants were informed about the purpose of the research and the steps of its implementation. They were also assured of the confidentiality of their information and could leave the study at any time, and the results of the study would be made available to them if they wished. Written consent was obtained from the participants. The principles of APA and the Helsinki Convention were also observed. After collecting the questionnaire and extracting data, descriptive statistics including mean, standard deviation and frequency distribution table were used, and at the level of inferential statistics, Pearson's correlation coefficient tests and multiple regression analysis were used through SPSS-24 software.

Results

110 children with autism spectrum disorder participated in this study, of whom 62.7% (69 people) were male and 37.3% (41 people) were female. The average age of the participants was 7.85 and the standard deviation was 2.25.

Table 1. Mean and SD of general functioning, theory of mind and developmental indicators (emotional and motor development) in the participants

Variable	X	SD
General function	4.11	1.16
Theory of mind	21.3	4.39
Emotional growth index	23.41	3.98
Object control motor growth index	30.72	6.93
Movement growth index	36.93	7.76

Table 1 shows the mean and standard deviation of the variables studied.

Table 2. Correlation matrix between developmental indicators and general functioning of children with autism spectrum disorder

	Variables	1	2	3	4
1	General function	1			
2	Emotional growth index	0.843**	1		
3	Object control motor growth index	0.863**	0.621**	1	
4	displacement motor growth index	0.691**	0.737**	0.692**	1

*p<0.05   **p<0.01

Table 2 shows that the general functioning of children has a significant positive correlation with the total score of emotional growth index (r=0.843 and P<0.01). Also, children's overall function has a significant positive correlation with the total score of object control motor growth index (r = 0.863, P<0.01) and displacement motor growth index (r = 0.691, P<0.01).

Table 3. Correlation matrix between theory of mind (and its components) and children's overall functioning of children with autism spectrum disorder

	Variables	1	2	3	4	5
1	General function	1				
2	Theory of Mind total score	0.578**	1			
3	Theory of Mind (First Level)	0.856**	0.865**	1		
4	Theory of mind (second level)	0.734**	0.738**	0.767**	1	
5	Theory of Mind (Third Level)	0.158**	0.432**	0.218**	0.274**	1

*p<0.05   **p<0.01

The results of the table3 show that the general functioning of children has a significant positive correlation with the total score of theory of mind (r=0.578 and P<0.01). Also, the general functioning of children with first level theory of mind score (r=0.856 and P<0.01), second level theory of mind score (r=0.734 and P<0.01) and third level theory of mind score (r = 0.158 and P<0.01) has a significant positive correlation.

Table 4. Multiple regression findings to investigate the role of developmental indicators and its subscales in predicting the overall functioning of children with autism spectrum disorder

Predictor variable	B	SE	β	T	sig
Constant	8.073	193	-	41.809	0.000
Emotional growth index	0.015	0.003	0.340	5.444	0.000
Object control motor growth index	0.239	0.039	0.125	2.622	0.010
Movement Motor growth index	0.126	0.049	0.138	2.548	0.012

$R^2= 0.89$

To determine the role of developmental indicators and its subscales as predictor variables and children's overall functioning as criterion variables, they were analyzed in the regression equation. As noted in Table 4, the results of the table show that 89% of the variance of children's overall functioning is explained by predictor variables.

According to the beta values of the emotional growth index (β = 0.34), Object control motor growth index (β = 0.12) and the displacement motor growth index (β = 0.13), these variables can significantly affect the overall functioning of children. Explain the autism spectrum.

Table 5. Multiple regression findings to investigate the role of theory of mind and its subscales in predicting general function in children with autism spectrum

Predictor variable	B	SE	β	T	sig
Constant	5.894	0.121	-	48.785	0.001
Theory of Mind total score	0.183	0.019	0.216	9.405	0.010
Theory of Mind (First Level)	0.097	0.062	0.097	2.614	0.018
Theory of mind (second level)	0.153	0.037	0.158	1.032	0.002
Theory of Mind (Third Level)	0.187	0.151	0.088	5.248	0.042

$R^2= 0.74$

To determine the role of theory of mind and its sub-scales as a predictor variable and children's general functioning as a criterion variable, they were analyzed in the regression equation. As seen in Table 5, the results of the table show that 74% of the variance of children's overall functioning is explained by predictor variables. According to the beta values of the total score of theory of mind (β = 0.21), first level theory of mind (β = 0.09), second level theory of mind (β = 0.15) and third level theory of mind (β = 0.08). β), these variables can significantly explain the overall functioning of children with autism spectrum.

Table 6. Multiple regression findings to investigate the role of theory of mind and developmental indicators in predicting the overall functioning of children with autism spectrum disorder

Predictor variable	B	SE	β	T	sig
Constant	7.859	0.170	-	46.074	0.001
Theory of Mind total score	0.07	0.013	0.309	6.046	0.035
Emotional growth index	0.13	0.002	0.281	5.145	0.000
Object control motor growth index	0.08	0.051	0.142	1.868	0.031
displacement motor growth index	0.09	0.034	0.072	1.961	0.019

$R^2 = 0.67$

To determine the role of theory of mind and developmental indicators as predictor variables and children's general functioning as criterion variables were analyzed in the regression equation. As seen in Table 6, the results of the table show that 67% of the variance of the overall functioning of children with autism spectrum is explained by predictor variables. According to the beta values of total theory of mind score ($β = 0.30$), emotional development index ($β = 0.28$), object control motor development index ($β = 0.14$) and transfer motor development index ($β = 0.07$) These variables can significantly explain the aggression of children with autism spectrum.

Discussion

One of the hypotheses of the research was that there is a positive relationship between developmental indicators and general functioning of children with autism spectrum disorder. The obtained results showed that developmental indicators (and its components) have a positive and significant relationship with the overall functioning of children with autism spectrum disorder. This finding is consistent with the results of previous studies by Tabatabai et al. (2015), Bhat et al. (2012), Leonard and Hill (2014), Donald et al. (2013), Dziuk et al. (2007) is in line.

In explaining this finding, it can be stated that object control skills of school children with autism spectrum disorder predict social communication skills through autism severity scores (Gotham et al., 2007). School-aged children with ASD consistently perform poorly on standardized tests of motor skills (Berkeley et al., 2001; Staples & Reid, 2010). Motor skills affect the social communication skills of children with ASD. Children with poorer object control skills have more severe ASD symptoms and therefore poorer social communication skills (Gotham et al., 2007). Tabatabai, Shahbazi and Bagherzadeh (2015) showed in a research that there is a significant relationship between motor development and social development of independent boys and girls. Also, in the group of boys, this relationship between gross motor skills, fine motor skills and hand-eye coordination with social development was significant. In the group of girls, there was a significant relationship between fine motor skills and hand-eye coordination with social development, but no significant relationship between finger agility and social development was observed in either of the two groups of boys and girls. Bhatt et al. (2012) showed in a study that autistics have more motor delays at 3 and 6 months of age than infants at risk of autism (with low-risk developmental delay).

Most autistics showed both early motor delays and later communication delays. Early motor delays are more common in autistic infants than in infants at risk for autism, and communication delays appeared later in 67-73% of autistic siblings who showed early motor delays. In a review study, Leonard and Hill (2014) showed the effect of motor development on ordinary and unusual social cognition and language, and in many of them there was a significant relationship between motor skills and the development of social cognition, language and social interactions. MacDonald et al. (2013) showed in a study that motor skills controlling objects significantly predict the severity of ASD. The result of this research briefly states that children with poor motor skills have more social communication skills deficits. MacDonald et al. (2013) showed in a research that fine motor skills significantly predict all adaptive behavior skills. Also, mixed motor skills predict daily life skills. Therefore, children who have weaker motor skills have more deficits in adaptive behavior skills, and basic and combined motor skills are significantly related to adaptive behavior skills in young children with autism spectrum disorder.

The next hypothesis of the research investigated the existence of a positive relationship between theory of mind and general functioning of children with autism spectrum disorder. The results showed that so far no study has investigated the relationship between theory of mind and general functioning of children with autism spectrum disorder. This issue makes it difficult to discuss the findings, but according to the studies done on the theory of mind, this issue can be discussed. Ghadiri and Soleimani (2019) found in a research that by improving executive functions, the levels of theory of mind can be increased. Ozonoff and McEvoy (1994) in a study showed that both executive functioning and theory of mind abilities in autistic individuals are seriously deficient or improve little during development and may never reach normal functioning levels and it seems which eventually ceases to grow. In a research, Zeynali et al. (2018) concluded that autistic children performed weaker in all three levels of theory of mind than normal children. These findings show why children with autism are weak in social skills, and also the deficit in self-perception and others causes a decrease in empathy in children with autism. Mansouri et al. (2009) found in a research that compared to normal children, children with autism have significant defects in the development of different levels of theory of mind, but age has no effect in this regard. On the other hand, intelligence and gender have a significant effect on the

evolution of the theory of mind. Mental maintenance alone also plays a role in the occurrence of defects in the theory of mind. In a research, Yaqouti et al. (2018) found that teaching theory of mind, the ability to recognize emotions and pretend (one level of theory of mind), understanding of primary false belief (second level of theory of mind), and understanding of secondary false belief (third level of theory of mind) of children with It increases autism disorder. The implications of the obtained results are discussed in the article.

Heydari et al. (2011) in a study entitled "Comparison of the Dimensions of Mind Theory in Children with Autism and Ordinary 5 to 10 Years of Isfahan City" concluded that children with autism in the entire test as well as small levels Mind theory tests gained lower scores than ordinary children, and there was a significant difference between the two groups. Explaining these findings that children with autism spectrum disorder were unable to understand the thoughts and feelings of fictional personalities; actually they cannot place themselves instead of them and are also unable to understand sophisticated jokes and judgments. On the other hand, the therapeutic interventions on children with autism spectrum disorder due to their low functioning at school compared with ordinary children, faced with problem and the impact of education on the evolution of mind theory, justifies the poor functioning of children with autism spectrum disorder compared to normal children. Therefore, it can be said that children with autism attribute the stimuli surroundings in different types compared to ordinary children.

Conclusion

In general, based on research findings, developmental indicators and theory of mind can predict the general function of children with autism spectrum disorder. As the results of this research and similar researches show, it can be said that developmental indicators and theory of mind both have a positive relationship with general functioning of these children; so that the increase of the subject's score in each of the variables of developmental indicators and theory of mind will lead to the improvement of the general functioning of these children. In this research, like other researches that are conducted in the field of behavioral sciences and psychology, there were limitations. Among these limitations was the use of a measurement tool and not paying attention to other social tools. The current research is correlational and the inability to interpret causal relationships from the results obtained is one of its limitations. Also, this research was conducted only on children with autism spectrum disorder and in a limited geographical area, so it is recommended for other Children and in different regions and cultures should also be examined. The next limitation of the research was the lack of control of many influential variables (such as social and economic class, time conditions). Considering the fundamental role of theory

of mind and developmental indicators in predicting general functioning, it is suggested to use educational workshops in order to improve the general functioning of children with autism spectrum disorder. Also, booklets and brochures should be printed in the field of providing ways to improve the general functioning of children with autism spectrum disorder, and classes and workshops should be organized in this field for the parents of children with autism.

Conflict of interest

No potential conflict of interest was reported by the authors.

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