SELF-REGULATION STRATEGIES USED BY AUTISTIC CHILDREN

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ABSTRACT

Introduction: The current research aimed to assess self-regulation strategies used by autistic children. **Methodology:** The design of the current study is a quantitative, descriptive design. A purposive sampling design was selected for the detection and obtaining the study setting. A convenient sampling technique was used by the researcher as the researcher selects the participants. Two tools were used for data collection; 1. Autism child demographic data and 2. Child self-regulation strategies. **Results:** A commonly observed strategy for the scale was the evidence of autistic child orientation, no object orientation distraction, and evidence of symbolic self-soothing. On the other hand, the least observed strategy was those of no avoidance, and evidence of other-directed and assistance-seeking. **Conclusion:** The present study yielded that measuring autistic Childs' self-regulation proved that more than 2/5th of autistic children had a high self–regulation. **Recommendations:** Teach parents and care givers to improve overall social quality of life.

Keywords : Self-Regulation in Autism, Autistic children, Physical self-soothing, Repetitive behavior.

INTRODUCTION

The Autism Society of America defines Autism as: a complex developmental disability that typically appears during the first three years of life and is the result of a neurological disorder that affects the normal functioning of the brain, impacting development in the areas of social interaction and communication skills (Autism Society of America, 2012). Autism affects information processing in the brain by altering the function of nerve cells and their synapses and their organization. This whole process is not well understood yet (Levy et al., 2009). Autism is a highly variable neuro developmental disorder that first appears during infancy or childhood, and generally follows a steady course without remission (Geschwind, 2008). Understanding emotions during early childhood relates positively to the development of adaptive social behavior and negatively to internalizing behaviors and behavioral problems (Bal et al., 2010; Blair & Coles, 2000). Further, the ability to recognize and label emotions predicts children's social competence (Mostow et al., 2002).

Self-regulation is the ability to regulate emotional states and physiological arousal, which includes the regulation of mood, self-calming, preparation for social interactions, coping with challenges, and delayed gratification. The ability to regulate one's emotional state is considered to be a core process that underlies attention and social engagement (Anzalone, 2007; Bieberich & Morgan, 2004; Prizant et al., 2006; Schaaf & Miller, 2005). Children with autism failed to look at adults expressing distress, fear and discomfort. They also appeared less concerned when an adult expressed distress compared to mentally retarded and typical children (Bal et al., 2010).

Children with autism differ in their approach towards their mothers, they do not tune into their mother's attention or focus. They fail to recognize the emotional and contextual meaning of facial expressions, gestures and nonverbal aspects of emotion. Children with autism typically do not use emotional gestures and often do not engage in eye contact or are unable to point at any object (Sharon, 2004). The number of children diagnosed with Autism has increased dramatically in the last 20 years. The latest statistics in USA suggest that one in every 91 children in the US has been diagnosed with autism (Solomon and Chung, 2012; Kogan et al., 2009).

The rate of occurrence of autism has greatly increased from the 1980s when children were diagnosed at a rate of two to five in 10,000 (Kogan *et al.*, 2009). Little debate remains about whether we are seeing an increase in actual cases or an increase in diagnosis, as recent research has indicated that, even when controlling for variables like casting a wider diagnostic net, the increase is real (Hertz-Picciotto & Delwiche, 2009).

A child with autism develops repetitive motor behavior as well as stereotyped patterns of behavior, that can manifest in varieties of ways: Child may repeat motor behavior such as eye-gazing, body-rocking, hand-flapping, tapping as well as vocalizations, abnormally focus on one pattern of behavior, or routine and may desperately seek absolute identicalness in their surroundings, have an abnormal relationship/interaction with toys, particularly focusing on specific parts of objects, reactions to sound may be extreme because he/she may not be able to filter the noises in the background and may also overreact to auditory stimulation (Essays, 2012).

A typical child with autism has difficulty acknowledging the role of subjective mental states, as can be derived from the extensive literature on their impaired Theory of Mind development (Rajendran & Mitchell, 2007). This may hinder their understanding of emotions as independent mental states, which is in line with their tendency to provide situational rather than subjective explanations for emotions. Furthermore, they are less attentive to negative emotions than typically developing children (Ashwin *et al.*, 2006 Boraston *et al.*, 2007), and less prone to learning about emotions from experience. This may result in a poor appreciation of the persistent effect of earlier negative emotions by children with autism (Begeer *et al.* 2010).

In Saudi Arabia a study was done by Saudi Autism Institution (Autism and Related Developmental Disorders in Saudi Children). The result revealed that the percentages of suspected autism cases according to regional distribution in Kingdom of Saudi Arabia were found to be as follows: Central Region (0.6%), Northern Region (0.4%), Eastern Region (0.5%), Southern Region (0.4%) and Western region (0.8%). In 2002, it was estimated that there were about forty thousand confirmed autistic cases and that many more could be misdiagnosed (Alqahtani, 2012; Al-Salehi, Al-Hifthy,

Ghaziuddin, 2009). Unfortunately, accurate statistics are not available about autism in Saudi Arabia. In formal records report an increase in the prevalence of autism in Saudi Arabia. Self-regulation strategies will help the child to maintain an optimal level of arousal, which will enhance learning and functional abilities (Anzalone, 2007; Prizant *et al.*, 2006; Schaaf & Miller, 2005). So self-regulation strategies of those autistic children may be in need for further assessment, adding to the different roles of Saudi psychiatric nurse.

Objective of the study:

The objective of this research is to assess self-regulation strategies used by autistic children.

Research questions

To accomplish the aim of this study the following research questions will be addressed:

Q1: Is the autistic child utilizing strategies for self regulation?

Q2: What are the most common strategies used by autistic children for self-regulation?

Q3: Is there a relation between self-regulation strategies and the autistic child characteristics?

Conceptual Definitions:

For the purposes of this study, the following conceptual definitions will be utilized:

Emotion Self-Regulation: This refers to a person's ability to understand and accept his or her emotional experience, to engage in healthy strategies to manage uncomfortable emotions when necessary and to engage in appropriate behavior (e.g., attend classes, go to work, engage with the social caregivers like with mother or others), to be physically or vocally prompts and scaffolds child (i.e. physical prompting with toy if child becomes frustrated (Gulsrud *et al.*, 2010)

Strategies: Defined according to tools of data collection used in the present study to define each of them separately then this score was correlated to each other's.

METHODOLOGY

Research Design:

The design of this study is a quantitative, descriptive design.

Setting

The study was conducted at Azaam Center for autism in Kingdom of Saudi Arabia (Riyadh) through the referral of autism cases from Autism Research and Treatment Center "ART Center" located in King Khalid University Hospital

- **Autism Research and Treatment Center "ART Center"** in King Khalid University Hospital is Competent governmental center for early detection of autism attributes, and perform research related to autism.

- **Azaam center** of autism is specialized center for training and rehabilitation of autism

Subjects

A purposive sampling design was selected for detection and obtaining the study setting. A convenient sampling technique was used.

Exclusion diagnostic criteria:

The exclusion criteria of the study group as follow: Autistic children who have either seizures, sensory or physical disorders) were not be included in the study. Also autistic child less than 3 years and more than 11years were also not included in this study

Subjects

The total number of subjects was 60 participants. At the time of data collection the participants enrolled from Azaam Center and Autism Research and Treatment Center (ART center)

Tools for data collection

There are two tools applied to collect data. They are:

1. Autism child demographic data

Including child age, sex, order of child in his/her among his/her brothers

2. Child self -regulation strategies

Strategies were adapted from a study of typical toddlers during episodes of negativity (Goldsmith and Rathbart 1996). The strategies include: symbolic self-soothing, repetitive behaviors, tension release, avoidance, distraction, maternal orientation, other directed comfort seeking and other directed assistance seeking. The presence or absence of each strategy was coded (0-1) to determine the strategy of each child.

Surveying for proposed center

As the researcher began to survey the autism centers in Riyadh city, the researcher went to the Autism Research and Treatment Center to understand the rules and the methods of their performance of care with autistic children.

Pilot study of the center

After surveying the centers, the researcher decided to select both centers; Autism Research and Treatment Center and Azzam center.

Tool Reliability

The reliability of the tools used in data collection was examined by investigating their internal consistency. They demonstrated a high level of reliability, with Cronbach alpha coefficients (0.68).

Scale	No. of Items	Cronbach's Alpha
Self-regulation	96	0.68

Process of data collection (procedure)

1. The Autism Research and Treatment Center in King Khalid University Hospital was visited and explanation of the aim and method of the present study were given.

2. Discuss was done with the "Autism Research and Treatment Center" and Azzam center for the exclusion criteria of the participant.

3. Subjects were selected by the "Autism Research and Treatment Center" according to the specified exclusion criteria.

4. The participants were chosen among children from Azzam center. The researcher revised records of children to make sure about accurate diagnosis following inclusive and exclusive criteria. Researcher read the children files before the start of session.

5. The observation started with the signature in the consent form by participant's agent for their agreement to enrollment in the present study. Then, the demographic data were filled by the researcher by asking the participant's.

6. Tool number two of "Child self -regulation strategies" were filled by researcher through the observation Session.

7. Data collection was done through mini sessions of Structured play that were presented by the researcher in the psychologist office located in Azzam Center for Autism

DATA ANALYSIS

Scoring system allocated by the tool author was followed through statistical analysis.

Scoring for Child self -regulation strategies

The strategies include: symbolic self-soothing, repetitive behaviors, tension release, avoidance, distraction, maternal orientation, other directed comfort seeking and other directed assistance seeking. The presence or absence of each strategy was coded (0-1) of each child strategy.

RESULTS

Table 1 describes the characteristics of the Autistic children. Their age was mostly 3-5 years (50%), with the majority being males (90%). about one-fourth of the participants were firstborn children (28.3%).

Table 1 : Demographic characteristics of autistic children in the study subjects(n=60)

Selected demographic characteristics of autistic children	Frequency	Percent
Child age (years): 3-5 6-8 9-11	30 20 10	**50.0** 33.3 16.7
Child sex: Male Female	54 6	**90.0** 10.0
Child birth order: 1 2-3 4-10	17 23 20	**28.3** 38.3 33.3

Table 2 demonstrates that the most commonly observed strategy for the scale were the evidence of autistic child orientation (83.3%), no object orientation distraction (80%), and evidence of symbolic self-soothing (78.3%). On the other hand, the least observed

strategy was those of no avoidance (33.3%), and evidence of other-directed and assistance-seeking (36.7%).

Table 2: Child's self-regulation strategies (n=60)

Self-regulation strategies	Frequency	Percent
Evidence of caregivers orientation	50	83.3
No object orientation/distraction	48	80.0
Evidence of symbolic self-soothing	47	78.3
Evidence of physical self-soothing	37	61.7
Evidence of tension release	34	56.7
Evidence of other –directed comfort- seeking	26	43.3
No repetitive/idiosyncratic behavior	23	38.3
Evidence of other –directed assistance –seeking	22	36.7
No avoidance	20	33.3

*Note: respondent gave more than one response or different response.

Table 3 displays the relation between autistic child's use of self-regulation and their characteristics. It indicates no statistically significant associations between emotional self-regulation and child's age, sex, or birth order.

Table3: Relation between autistic child's use of self-regulation and their characteristics

Selected characteristics	Self- regulation				X^2 test	p-value
	High (67%+)		Low (<67%)			
	No.	%	No.	%		
Child age (years): <6 6+	13 13	43.3 43.3	17 17	56.7 56.7	0.00	1.000
Child sex: Male Female	23 3	42.6 50.0	31 3	57.4 50.0	0.121	0.728
Child birth order: 1 2-3 4-10	6 11 9	35.3 47.8 45.0	11 12 11	64.7 52.2 55.0	0.659	0.719

Figure 1: The Pie chart illustrates that almost all autistic children were living in Riyadh, with only 3 (5%) were living in outskirts of Riyadh.

Figure 1: Place of residence of autistic children in the study subjects (n=60)
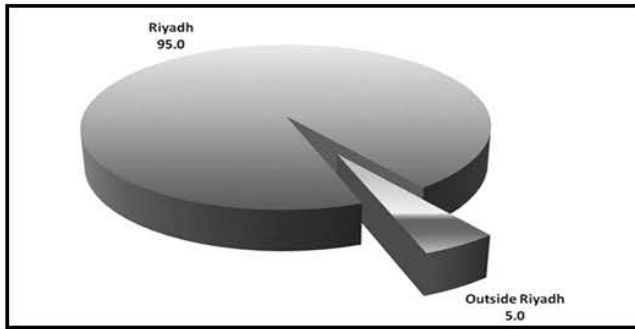

Figure 2: Overall, Pie chart illustrates that slightly more than two-fifth (43.3%) of the autistic children had high self-regulation.

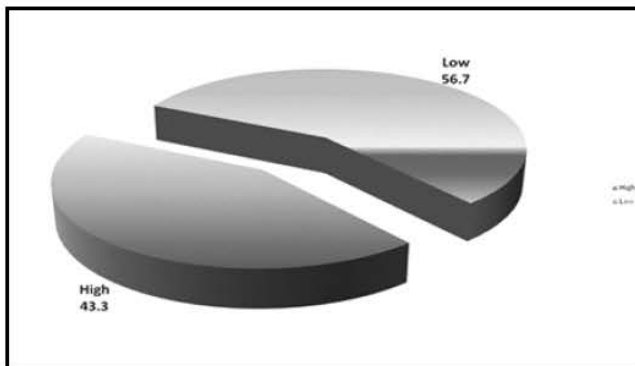*Figure 2 : Total self-regulation among autistic children in the study subjects (n=60)*

Table 4 represents the best fitting multiple linear regression models for child's self regulation score. It indicates that the scaffolding score is the only statistically significant independent predictor. The model explains 10% of self regulation score.

Table 4 Best fitting multiple linear regression model for childs self regulation score.

	Unstandardized coefficients		Standardized coefficients	*t*-test	*p*-value	95% Confidence interval for B	
	B	Std. Error				Lower	Upper
Constant	44.434	5.809		7.649	0.000	32.807	56.062
Scaffolding score	0.173	0.78	0.280	2.219	0.030	0.017	0.329

DISCUSSION

The detected prevalence of autism disorder has increased over the past decade with a current estimate of 1.1%. (Scahill *et al.*, 2013; Center of disease control and prevention *et al.*, 2012)

In the diagnostic and statistical manual of mental disorders (5th ed.; DSM5) autism is characterized by qualitative impairments in social interaction and social communication, as well as restricted interest and ritualistic movements and behavior (American Psychiatric Association, APA, 2013).

The challenges, for measuring autistic disorders among these children vary according to the targeting aspects to be measured. In this study the researcher select Child self -regulation strategies scale to assess self-regulation strategies used by autistic children. These strategies include: symbolic self-soothing, repetitive behaviors, tension release, avoidance, distraction, maternal orientation, other directed comfort seeking and other directed assistance seeking.

In this study, the characteristics of autistic children shows that half of autistic children were of 3-5 years age and the majority of them were males, also one fourth of autistic children were the first sibling (table-1).

In congruence with the present research a study by Lickenbrock, Ekas & Whitman, (2011) concluded that the majority of ASD children populations were males (table -1). Furthermore a study by Alqahtani, (2011) conclude that 57% of ASD participants were with age range (3-6years) and nearly above half (53%) were male and both studies were in concordance with this present study. Therefore the results indicated that majority of children of ASD were male and the incidence of the disorder were common in male than in female children (Swanepoel, 2003; Rosset *et al.*, 2008; Cole *et al.*, 2009; Ryan, 2010; Rieffe *et al.* 2011; Glaser & Shaw 2011; Bekhet *et al.* 2012). In the present study measuring autistic Childs' self-regulation proved that more than two fifth of autistic children had a high self –regulation (figure-2). This result contradicted with a study conducted in USA by Bieberich & Morgan (2004). The findings suggested that the deficit in self regulation was 3% among autistic children group. Also other study for identifying early indicator for autism in self regulation by Gomez & Baird, (2005), revealed that the parents reported that their children with autism

exhibited difficulties in self-regulation (91%) of their autistic children in study population. Other study conducted in Amestrdam by Begeer, Terwogt, Rieffe Stegge, Olthofe Koot (2010) compared between typical developing children and autistic children in understanding of emotional transfer. The study verified that the children with autism reported no difference in preceding positive and negative emotion. At the same time the result of present study regarding autistic child self regulation in accordance with the study conducted in Francisco USA by Muller & Schuler, (2006) concluded that the autistic children employed a higher percent of affective emotion than their normally developed children. Hence results of different studies on autistic children may prove different results depending on stage of development, upbringing, care and seeking help from health care professionals.

Other studies reported that a pervasive developmental delays among autistic child precisely in the areas of routine social exchanges, the use of concrete symbolic objects from real life situations, affective involvement, regular social support, cognitive capacity to symbolize and specific social learning (Saba, 2004; Hobson 1993; Mundy, Sigman, and Ksari et al., 1993).

Applying self-regulation scale to autistic children in this study in Saudi Arabia reflected that the most commonly observed strategy for the scale were the evidence of autistic child orientation, no object orientation distraction and evidence of symbolic self-soothing. On the other hand, the least observed strategy was those of no avoidance, and evidence of other-directed and assistance-seeking.

The child's self-regulation score (Table 4) represents that the scaffolding score is the only statistically significant independent predictor. This contradicts with the study of Bailey et al., 2000 and Konstantareas and Stewart, 2006. According to them children with autism rated as more inconsistently difficult, slower to adapt, less persistent, less able to focus and shift attention, and more easily distracted when compared to typically matched peers.

Researches hypotheses were that the autistic child can learn to self- regulate or become comfortable with sensory stimulation (Paron, 2004). Saudi mothers most probably subjected their autistic child in sensory stimulation. It is proposed that play therapy operate at the child's current level and is highly individualized, as these children can determine the space and focus of change (Saba, 2004).

CONCLUSION

The present study yielded that measuring autistic Childs' self-regulation proved that more than two fifth of autistic children had a high self-regulation.

RECOMMENDATIONS

The study may recommend to:

1. A structured play therapy program that promote the rest of the child self- regulatory strategies.

2. Encouraging of symbolic play and engagement in sensory motor play.

3. Teach parents and care givers to improve over all social quality of life.

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REFERENCES

Alqahtani, M. J. (2012). Understanding autism in Saudi Arabia: A qualitative analysis of the community and cultural context. Journal of Pediatric Neurology. 10(1), pp 15-22.

Al-Salehi, S. M., Al-Hifthy, E. H. & Ghaziuddin, M. (2009). Autism in Saudi Arabia: presentation, clinical correlates and comorbidity. Transcult Psychiatry. 46(2), pp 340-347.

American Psychiatric Association (2013). Diagnostic and statistical manual of mental disorders: DSM-IV. 4th edition. Washington, DC. American Psychiatric Publishing, Inc; 2000. pp 69-84.

Anzalone, M. E. (2007). Sensory Integration and Self-Regulation in Early Intervention and Preschool. Presentation Handout. Victoria, B.c.: Canada.

Ashwin, C., Wheelwright, S. & Baron-Cohen, S. (2006). Finding a Face in the Crowd: Testing the Anger Superiority Effect in Asperger Syndrome', Brain and Cognition 61(1), pp 78–95.

Autism Society of America (2012). Available from: http://www.autism-society.org/

Bailey, D., Hatton, D., Mesibov, G. & Ament, N. (2000). Early development, temperament, and functional impairment in autism and Fragile X syndrome. Journal of Autism and Developmental Disorders. 30(1), pp 49-59.

Bal, E., Harden, E., Lamb, D., Van Hecke, A., Denver, J. W., & Porges, S. W. (2010). Emotion Recognition in Children with Autism Spectrum Disorders: Relations to Eye Gaze and Autonomic State. Journal of Autism & Developmental Disorders. 40(3), pp 358-370.

Begeer, S., Terwogt, M. M., Rieffe, C., Stegge, H., Olthof, T. & Koot, H. M.(2010). Understanding Emotional transfer in children with autism spectrum disorders. Autism. 14(6), pp 629-40.

Bekhet, A. K., Johnson, N. L. & Zauszniewski, J. A. (2012). Effects on resilience of caregivers of persons with autism spectrum disorder: the role of positive cognitions. Journal of the American Psychiatric Nurses Association. 18(6), pp 337-44.

Bieberich, A. & Morgan, S. (2004). Self-regulation and affective expression during play in children with autism or Down syndrome: a short-term longitudinal study. Journal of Autism & Developmental Disorders. 34(4), pp 439-448.

Blair, R. J. R., & Coles, M. (2000). Expression recognition and behavioral problems in early adolescence. Cognitive Development. 15(4), pp 421–434.

Boraston, Z., Blakemore, S. J., Chilvers, R. & Skuse, D. (2007). Impaired Sadness Recognition is Linked to Social Interaction Deficit in Autism. Neuropsychologia. 45(7), pp 1501–1510.

Cole, P. M., Dennis, T. A., Smith-Simon, K. E., & Cohen, L. H. (2009). Preschoolers' Emotion Regulation Strategy Understanding: Relations with Emotion Socialization and Child Self-regulation. Social Development. 18(2), pp 324-352.

Centers for Disease Control and Prevention (CDC) (2012) Prevalence of autism spectrum disorders: Autism and Developmental Disabilities Monitoring Network, 14 Sites, United States, 2008. Morbidity and Mortality Weekly Report. Surveillance Summaries. 61(3), pp 1–19.

Essays, F (2012). Autism and the Impact on Family: A Developmental Perspective Glaring Facts. Available from: http://www.theglaringfacts.com/staff-essays/autism/.

Geschwind, D. H. (2008). Autism: many genes, common pathways? Cell. 135(3), pp 391–5.

Glaser, S., & Shaw, S. (2011). Emotion regulation and development in children with autism and 22q13 Deletion Syndrome: Evidence for group differences. Research in Autism Spectrum Disorders. 5(2), pp 926-934.

Goldsmith, H. H. & Rothbart, M. K. (1996). The laboratory temperament assessment battery (LAB-

TAB):Locomotor version 3.0. Technical manual. Department of Psychology, University of Wisconsin, Madison, WI. (plus corresponding version of the prelocomotor battery manual).

Gomez, C. R. & Baird, S. (2005). Identifying Early Indicators for Autism in Self- Regulation Difficulties. Focus On Autism & Other Developmental Disabilities. 20(2), pp 106-116.

Gulsrud, A.C., Jahromi, L. B. & Kasari, C. (2010). The co-regulation of emotions between mothers and theirchildren with autism. Journal of Autism and Developmental Disorders. 40(2), pp 227-37.

Hertz-Picciotto, I. & Delwiche, L. (2009). The rise in autism and the role of age at diagnosis. Epidemiology. 20(1), pp 84–90.

Hobson, P. (1993). Autism and the development of mind. Hillsdale, NJ: Erlbaum.

Konstantareas, M. & Stewart, K. (2006). Affect regulation and temperament in children with autism spectrum disorder. Journal of Autism and Developmental Disorders. 36(2), pp 143–154.

Kogan, M. D., Blumberg, S. J., Schieve, L. A., Boyle, C. A., Perrin, J. M., Ghandour R. M., Singh, G. K., Strickland, B. B., Trevathan, E. & van Dyck, P. C. (2009). Prevalence of parent-reported diagnosis of autism spectrum disorder among children in the US, 2007. Pediatrics. 124(4), pp 1–11.

Levy, S. E., Mandell, D. S. & Schultz, R. T. (2009). Autism. Lancet. 374(9701), pp 1627-38.

Lickenbrock, D. M., Ekas, N. V. & Whitman, T. L. (2011). Feeling good, feeling bad: influences of maternal perceptions of the child and marital adjustment on well-being in mothers of children with an autism spectrum disorder. Journal of Autism and Developmental Disorders. 41(7), pp 848-58.

Mostow, A. J., Izard, C. E., Fine, S. & Trentacosta, C. J. (2002). Modeling Emotional, cognitive, and behavioral predictors of peer acceptance. Child Development. 73(6), pp 1775–1787.

Muller, E. & Schuler, A. (2006). Verbal Markiting of Affect by Children with Asperger Syndrom and High Functioning Autism during Spontaneous Interactions with Family Members. Journal of Autism & Developmental Disorderts. 36(8), pp 1089-1100.

Mundy, P., Sigman, M. & Kasari, C. (1993). The theory of mind and joint attention deficits in autism. In S. Baron-Cohen, H. Tager-Flusberg, & D.J. Cohen (Eds.), Understanding our minds: Perspectives from autism. Oxford: Oxford University Press.

Paron, A.J. (2004). The degree of Master of arts. Rhodes university Sensory Stimulation and Autistic Children, University of Minnesota.

Available at: Newsletter.vol.06,04.at:http://www.informedesign.org/_news/apr_v06r-pr.pdf

Prizant, B.M., Wetherby, AM., Rubin, E., Laurent, AC. & Rydell, PJ. (2006). The SCERTS model: A comprehensive educational approach for children with Autistic Spectrum Disorders, volume 1 assessment. Baltimore, ML: Paul H. Brooks Publishing Co., Inc.

Rajendran, G. & Mitchell, P. (2007). Cognitive Theories of Autism. Developmental Review. 27(2), pp 224-260.

Rieffe, C., Oosterveld, P., Terwogt, M. M., Mootz, S., van Leeuwen, E. & Stockmann, L. (2011). Emotion regulation and internalizing symptoms in children with autism spectrum disorders. Autism: The International Journal Of Research & Practice. 15(6), pp 655-670.

Rosset, D., Rondan, C., Da Fonseca, D., Santos, A., Assouline, B. & Deruelle, C. (2008). Typical emotion processing for cartoon but not for real faces in children with autistic spectrum disorders. Journal of Autism & Developmental Disorders. 38(5), pp 919-925.

Ryan, C. & Charragáin, C.N. (2010). Teaching emotion recognition skills to children with autism. Journal of Autism and Developmental Disorders. 40(12), pp 1505-11.

Saba, K. (2004). Non-Directive Play Therapy for Young Children with Autism: A Case Study. Clinical Child Psychology and Psychiatry. 9(4), pp 533-551.

Scahill, L., Aman, M. G., Lecavalier, L., Halladay, A. K., Bishop, S. L., Bodfish, J. W., Grondhuis, S., Jones, N., Horrigan, J. P., Cook, E. H., Handen, B. L., King, B. H., Pearson, D.A., McCracken, J. T., Sullivan, K. A. & Dawson, G. (2013). Measuring repetitive behaviors as a treatment endpoint in youth with autism spectrum disorder. Autism. 19, pp 38–52

Schaaf, R. C. & Miller, L. J. (2005). Occupational therapy using a sensory integrative approach for children with developmental disabilities. Mental Retardation and Developmental Disabilities Research Reviews. 11(2), pp 143-148.

Sharon M. Valente.(2004). Autism. Journal of the American Psychiatric Nurses Association. 10(5), pp 236-243.

Solomon, A. H. & Chung, B. (2012). Understanding Autism: How Family Therapists Can Support Parents of Children with Autism Spectrum Disorders. Family Process. 51(2), pp 250-264.

Swanepoel, Y. (2003). Primary caregivers' experiences of raising children with autism: a phenomenological perspective: a thesis submitted in partial fulfillment of the requirements for   the degree of Master of Arts, Rhodes University.