IJFANS
International Journal of Food And Nutritional Sciences

Volume 4, Issue 3, Apr-Jun 2015, www.ijfans.com e-ISSN: 2320-7876

INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES

IMPACT FACTOR ~ 1.021

Official Journal of IIFANS

INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES

e-ISSN **2320 –7876** *www.ijfans.com*
Vol.4, Iss.3, Apr-Jun, 2015

Research Paper ***Open Access***

STUDY OF EATING HABITS FOR CHILDREN WITH AUTISM AT VIJAYAWADA CITY

T.S.Prabhakar[1], R.Rekha[2*] and N.S.Vital Rao[3]

[1]Department of Pediatrics, Siddhartha Medical College, Vijayawada, India. [2]Department of Food, Nutrition and Dietetics, Andhra University, Visakhapatnam, [3]Department of Pediatrics, Siddhartha Medical College, Vijayawada, India.

[*]Corresponding author:

Received on: 2nd March, 2015 **Accepted on: 19th June, 2015**

ABSTRACT

Autism spectrum disorders (ASDs) are considered to be a major health and educational problem, affecting many areas of daily living, including eating. Children with ASDs are often described as picky or selective eaters. The aim of this study is to investigate the eating habits for children with autism. This study was conducted at autism private centers, and autism Rehabilitation center and tertiary teaching hospital in Vijayawada city. The total number of sample was 62 children diagnosed with autism ranging from 6-12 years. To collect data an interview questionnaire was used.. The majority of them were males and the vast majority of them live in urban areas. More than two thirds of mothers and three quarters of fathers had high level of education. 45.2% of children had very active level. The majority of the studied sample had good appetite for specific food and all children favorite carbohydrate; therefore (56.5%) of them did not receive balanced diet. Also; nearly half of children (38.8 %) had good eating during watching TV. The majority of children received medication that affects their appetite. As regards BMI, 35.5% of the studied children were overweight. There was a statistically significant differences between child appetite and health problems (take medication and GIT problems) P= 0.001. The present study concluded that children with autism spectrum demonstrated a less varied diet feeding behavior and limited interests and difficulty in accepting change and types of foods that affected child weight.

Keywords: autism, feeding problems, nutrition, food selectivity.

INTRODUCTION

Autism is a complex psychiatric disorder of childhood and adolescence (Levy SE *et al* 2009). According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; 2013) autism is characterized by three core symptoms, i.e. impairments in social interaction, restricted patterns of behavior and impairments in communication, The disorder has been shown to occur in approximately 0.2 % of child and adolescent populations. Prevalence estimates seem to have risen over the last two decades (Fombonne *et al* 2009). Prevalence estimates for autistic disorder before 1987 did not exceed 0.07 %, while, for reasons as yet unknown, all studies published since 2000 have consistently shown higher rates (range 0.07 to 0.4 %). While the increase in prevalence might be attributed to a concomitant rise in the incidence of the disorder, other factors such as changes in the concepts and diagnostic criteria as well as a growing awareness within Western societies have been suggested as alternative explanations (Fombonne *et al* 2009). Risk-inducing environmental agents and the potential role of nutrition have been discussed in the context of a gene-environment interaction (Herbert MR *et al* 2010). From this point of view, an unbalanced diet might be able to induce biological vulnerability by itself or an otherwise balanced diet might disturb the organism's homeostasis in the case of metabolic insufficiency (Herbert MR *et al* 2010).

Globally, there has been an increase in the prevalence of diagnoses of ASD. In the US, the incidence has been found to be ~ 1 in 88 births (Department of Health and Human Services Centers for Disease Control and Prevention, 2012). In Australia, ~ 1 in 160 children between the ages of 6 – 12 years are diagnosed with ASD (McDermott *et al* 2007). Similar data have been presented from other parts of the world. Honda *et al* 2005, Vijay Sagar KJ *et al* 2011 completed a comprehensive review of studies from the US, Canada, the UK, Germany, France, Sweden, Norway, Israel, Japan, India and Finland (Honda *et al* 2005).

Eating is an important aspect in childhood because it is related to growth and development process. Besides, eating also reflects parent's attentions in rearing their children. Refuse food is described as avoiding food

and won't eat" that can effect picky eater behavior while eat limited food behavior is expressed by eating small number of food and unwilling to try new food or neophobia. Many studies reported that children"s eating behaviour was characterized by food preference and small numbers of food children eat. Studies in normal population's children in US, European and Asian countries showed that young children were common to have a picky eater or food neophobia (Wright *et al* 2007; Charruth *et al* 2000; Yen *et al* 1994; Charruth *et al* 2003). Recently, a relation between autism and eating behavior has been discussed in many studies. Several researches noted that children with autism have showed aberrant patterns of food acceptance, are commonly selective in food type (only eating the food they like or picky eater) and eat a narrow range of food than children without autism (Williams *et al* 2000; Schreck *et al* 2004). It was also reported that children with autism are more likely to exhibit disruptive behavior when they refuse presented food (Ahearen *et al* 2001).

Feeding difficulties have been observed in children with ASD since the disorder's earliest descriptions, and Ledford and Gast (2006) reported in their review that between 46 – 89% of children with ASD present with a feeding difficulty of some description. Weight gain (where energy intake exceeds requirements in the presence of adequate or inadequate nutrient balance), and weight loss (where energy intake is less than requirements) can result from restricted dietary variety, and both states have been observed in children with ASD (Jeanne Marshall *et al* 2014). Other reports have also demonstrated that poor nutritional balance during early life can have signifi cant implications for adult health, particularly with regard to cardiovascular disease and type II diabetes (Jeanne Marshall *et al* 2014).

Furthermore, difficulties in social interaction and communication that are the characteristic of children with autism may lead them to have problems in learning behavior needed for daily activity such as eating behavior. Restricted, repetitive behavior, sameness, distress over trivial change and interest in following routines or ritual may contribute in the idiosyncratic eating behavior. In the relationship between autism and gastrointestinal abnormalities, a study found that gastrointestinal abnormalities such as reflux esophagitis correlate with the sudden irritability and aggressive behavior in autism, which might be the causes of some behavioral problems in mealtime (Horvarth *et al* 1999).

The purpose of this study to systematically review specific patterns and area of concern regarding feeding and eating expressed by families of children with autism. And to assess eating habits for autistic children, to identify health / behavior problems which affect the eating patterns for autistic children, to assess the anthropometric measurements as (weight, height, and body mass index).

METHODS AND SUBJECTS

The sample consisted of 62 autistic children selected from three special areas i.e. autism private centers, and autism Rehabilitation center and Tertiary teaching hospital in Vijayawada city.

The age of children ranged from 6-12. Inclusion criteria for autism group involving: approving consent form by parents of children, The diagnosis of autism by a psychiatrist based on Diagnostic and Statistical Manual of Mental Disorders, The severity of autism symptoms in children with moderate to severe mode confirmed by psychiatrist, age of 12-6 years, male, Rating intelligence quotient (IQ) more than 50. An interview questionnaire was developed by the researchers based on a review of relevant literature to elicit information from parents or caregivers.

The researchers interviewed the participant on an individual basis in special place. Throughout the interview every answer from the participant was recorded according to designed question in the form, once a week at a rate of (5-7) sheet per day. It consists of four main parts: Part I: It includes items related to parents and their children socio-demographic characteristics such as age, sex, residence, birth order, education and occupation. Part II: It includes items related to history of disease as:- Present history of disease: included onset and duration of disease, activity level. Part III: It includes items related to child eating behavior as: number of meal, child appetite, type of favorite diet, balanced diet, time of good child eat, child eat from the floor and causes of child eat from the floor. Part IV: It includes items related to anthropometric measurements as: child's weight, height. Body mass index was calculated. Data analysis was performed by using SPSS software.

RESULTS

These findings are categorized in three sections. First, the findings related to the general data, and socio demographic characteristics in the second part, the results of anthropometric data, motor development activity level and in the third section, the inputs data of energy and eating behaviors.

As regarding the age of children more than half of them (54.84%) their age ranged from 9-12 years, the majority of them (85.5%) where male and (51.6%) had second birth order. The vast majority of children (82.25%) live in urban area. Also, the present study represent (53.25%) of mother and (77.43%) of father had graduating from university, master and doctor degree level of education and more than two third (77.5%) worked mother while the majority of father (85.5 %) governmental working. Table 1 shows the socio demographic characteristics of parents and their children with autism.

Table 1: Socio demographic characteristics of children with Autism and their parents (n=62)

Characteristics	No	%
Age:		
6 - <9 years	28	45.16
9 - <12 years	34	54.84
Gender		

Male Female	53 09	85.5 14.5
Birth order First Second Third or more	12 32 18	19.35 51.6 29.05
Residence Urban Rural	51 11	82.25 17.75
Mother's education Illiterate & primary Secondary & technical institute University, Master and doctor degree	11 18 33	17.75 29.0 53.25
Mother's occupation Working Not working	48 14	77.5 22.5
Father's education illiterate & primary Secondary & technical institute University, Master and doctor degree	2 12 48	3.22 19.35 77.43
Father's occupation Governmental Non governmental	53 09	85.5 14.5

Table 2 shows the distribution of motor development, activity level and current child's behavior among autistic children. Regarding to child motor development it was found the majority (87.0%) of the children walk alone and more than half of them (48.3%) unable to speak first word. Concerning child activity level shows that (45.2%) of children had very active level and only (3.2%) had quiet level. As regard child behavior more than two third of the children (72.5%) had obey simple order and about one third (38.7%) of them had no communication with the family.

Table 2: Distribution of motor development, activity level and current children behavior among autistic children (n=62)

Items	No	%
Motor development:#		
Walk alone	54	87.0
Self eating	37	59.6
Unable to dressing	44	71.0
Unable to speak first word	30	48.3
Unable to speak first sentence	38	61.2
Child's activity level:		
Extremely active	6	9.7
Very active	28	45.2
Moderately active	23	37.0
Active	1	1.7
Quiet	2	3.2
Lethargic	2	3.2
Child's behavior:#		
Non communication with the family	18	29.0
Obey simple order	45	72.5
Lack in speech and languch	39	62.9
Difficult direct, indirect communication	24	38.7
Repeated stereotype	23	37.1
Failed in relation with friends	40	64.5
Unable to participate others in activities	41	66.1
Repeated some behavioral as the same style	38	61.2

#More than answer

Regarding the number of meals it was observed that more than half (58.1%) of children had take 1-3 meals per day and the majority (83.9%) of the children had good appetite for specific food. Concerning types of favorite diet shows that (98.5%) of children had take carbohydrate; therefore (56.5%) of them had not take balanced diet. Also; nearly half of children (38.8%) had good eat when alone and only (30.6%) of them eat during watching TV (table 3).

As regard to the effect of health problems on appetite of autistic children table (4) indicates that more than two third of them (82.2%) the parents stated that the health problem affect on their children appetite. Such as (88.7%) of children had taking medication followed by (38.8%) had complain from GIT. And there was a statistically significance deference between health problems and appetite P= 0.001.

Table 3: Distribution of the current eating behavior among autistic children

Items	No	%
Number of meal:		
1- 3 meals/ day	36	58.1
4 and more meals/day	26	41.9
Child's appetite:		
loss of appetite	3	4.83
Good appetite for specific food	52	83.9
Good appetite for all food	7	11.27
Type of favorite diet :##		
Carbohydrate	61	98.5
Protein	28	45.2
Fat	18	29.1
Vitamins and minerals	25	40.3
Soda drink	41	66.1
Balanced diet:		
Yes	27	43.5
No	35	56.5
Time of good child eat:		
During watching TV	19	30.6
Alone	24	38.8
Within group	19	30.6

More than answer

Table 4: Distribution of common health problems among of autistic children

Items	No	%
Problems		
Having to take medication	55	88.7
Asthma	5	8.1
Ear infection	6	9.6
Hospitalizations	3	4.8
GIT	24	38.8
Psychological	8	12.9
Convulsion	5	8.1
Total number	51	82.2

It was found that more than half of children (48.7% and 56.2%) respectively had smelling food and taking medication while only (7.8%) of them had spitting food (Figure 1). Figure (2) shows the assessment of nutritional status for children with autism according to BMI and teething condition. As regard with BMI, it was found that (35.5%) of the studied children were overweight and (9.8%) had obese. Concerning the teeth condition (58.0%) of the children had teeth carries while (24.3%) had carries and loss teeth.

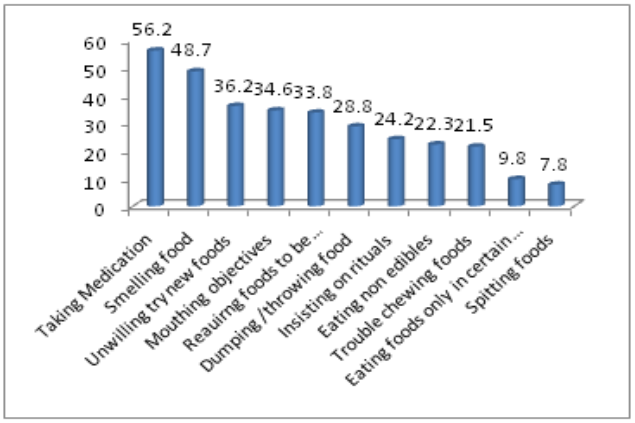

Figure 1: Shows the distribution of habits/problems among autistic children

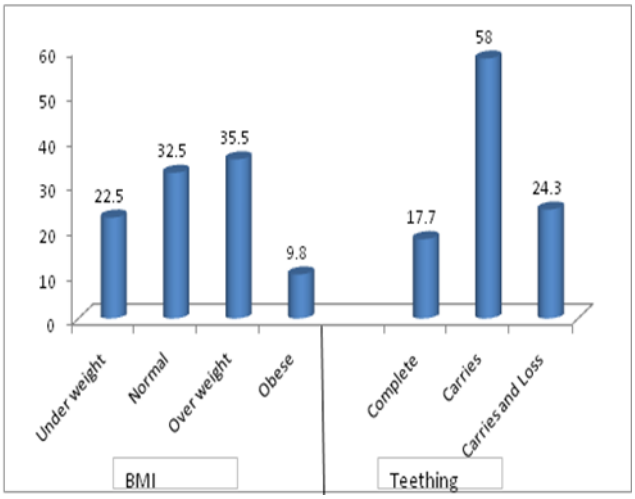

Figure 2 Assessment of nutritional status for children with autism according to BMI and teething condition

DISCUSSION

Children with ASD are commonly reported to have difficulty with mealtimes, both in terms of dietary variety and in the demonstration of problematic behaviors. Food refusal based on texture, food neophobia, and rigidity around mealtimes was the most common problematic behaviors reported across the higher quality literature reviewed. Food refusal and resistance to routine changes are likely barriers to the improvement of mealtime behaviors and dietary intake in the home, and emphasise the need for feeding intervention in this group. This study provided several information related to children‟s eating behavior.

This study showed consistency with other previous studies that reported refuse food and eat limited food behaviors were common in children (Wright *et al* 2007; Charruth *et al* 2000; Yen *et al* 1994; Charruth *et al* 2003; Bhuvaneswari and Nazni, 2011). In the correlation between gender an eating behaviors, this study was in line with previous study that reported males and females were not differ in eating behaviors (Lukens *et al* 2008). In the relationship between eating behavior and age, it was still conflicting how eating problems can be changed by age. Some studies reported eating problems could be decreased by age while other studies reported it was stable during childhood (Galloway *et al* 2003; Nazni and Bhuvaneswari, 2013). Our result demonstrated that limited food behavior was same as through the ages between 6 to 9 years. This difference could be related to the differences of family eating behavior, environment, and culture that could influence the development of children eating behavior.

There has been a true and significant increase in the number of people diagnosed with autism worldwide. Today, the health and education authorities have not paid enough attention to this serious issue and its present and future impact (Zeglam *et al* 2012). Parents of children with autism are faced with their child's limited food preferences and eating behaviors. Some parents feel that changes in their child's diet may make a difference in how the child feels or acts. With so much information disabilities in early childhood (Holt 2008). This is also due to the increased risk of developmental and motor skills delays as also found in the study by (Collins 2003).

As regarding the distribution of the studied sample with socio demographic characteristics of the children with autism and their parents, it was found that more than one quarter of studied children (26.8%) their ages ranged from 6 < 9 years with the mean age was 9.1± 5.3 years, this finding in agreement with (Elbahnasawy *et al* 2011) who stated that less than half of children with autism, their age ranged from 1 < 5. While William, *et al* 2000, reported that 48% of children with autism their age were between 5 and 6 years. Also this finding in accordance with Wong (2007) who mentioned that, the autism typically appears in the first 3 years of life. Namal *et al* (2007) found that the mean age was 7.3 ± 2.5 years.

The present study showed that the majority of children (85.5%) where male this result agree with Elbahnasawy *et al* (2011) who found that more than two

thirds of children with autism are boys. This result was supported by Cohen *et al*. (2006) who stated that autism is four times more likely to appear in boys than in girls. This finding was also supported with Hassan (2008) who studied caregivers' awareness regarding to autistic children and found that the majority of children were boys. Also, in the same line with study of Namal *et al*. (2007) who mentioned that (91.6%) of the children were males.

The present study revealed that (51.6%) of children had second birth order. This finding in accordance with Elbahnasawy *et al* (2011) who stated that two fifths of children with autism were ranked the first child. The present study represents the majority of the children live in urban area. In the same line with Palmer *et al* (2006), Palmer *et al* (2009) who found the same parameter of urban versus rural as having the greatest risk for autism, less than three quarters of them reside urban areas (Lewandowski *et al* 2009) This may suggested that potentially increased autism risk as a result of urban city is not ethnically specific but may be more directly related to urbanicity. David *et al* (2005) observed that rural children received a diagnosis 0.4 years later than urban children.

Also, nearly three quarter of parents had graduating from university, master and doctor degree level of education and more than tow third of mother were working. It is agree with Attiya (2006) who mentioned that the majority of parents were highly educated and more than half were housewives. Elbahnasawy *et al* (2011) who reported that more than two fifths of parents were highly educated. As well, more than two thirds of mothers were not working and less than three quarters of them reside urban areas. The researchers see the high level of education and income of their parents leads to early detection and diagnoses, treatment and follow up, also, their parents worked more time and leave the children in house for long time without care and guidance. Therefore send their children to special care centers. David *et al* (2005) observed that poor children received a diagnosis 0.9 years later than those with incomes >100% above the poverty level.

Concerning for motor development it observed that more than half studied children had lack motor development as self eat and verbal communication. As regard child behavior more than two third of the children had obey simple order and only one third had no communication with the family. Curtin *et al* (2010) and Nazni et.al., (2008) who stated that children with ASDs have motor impairments, low levels of physical activity due to impairments in social skills which may limit participation in structured activities with peers and strongly correlated with the social, communicative, and behavioral impairments.

Regarding the responses to current activity level indicated that (9.7 %, 45.2%, 37.0%, 1.7%, 3.2% and 3.2%) respectively of parents considered their children to be extremely active, every active, moderate active, quite, and lethargic. There was found statistically significant differences between child activity level and child appetite P= 0.001. This results agree with William *et al* (2000) who found that (15.0 %) of parent considered their children to be extremely active, (51.0%) were considered every active (29.0%) were judged moderate active (3.0%) quite, and (1.0%) lethargic.

Children with autism exhibit feeding behaviors and emotional responses as a result of their underdeveloped gastrointestinal tract and difficulties with digestion. The problems described by Smith *et al* (2005) are very similar to what is found clinically in children with ASD; they are “picky” eaters, eat few vegetables, rarely eat the same meal as the rest of the family, do not want different foods to touch each other, have aversions to certain tastes and textures, refuse some foods because of their smell, and do not like extremes of temperature.

Concerning the eating behavior among child in the present study (Table 3), it was revealed that the majority of them had good appetite for specific food, because the children with autism usually favorite one type of food according to their color, smell and taste. More than one third had fairly well-balanced diet and (43.5%) of total sample had good eat during watching television. It’s may be attributed by eat during watching television seek attention of children appetite centers.

In the present study all studied children eat a lot of carbohydrates and (66.1%) of children take soda drink. It is agreed with Benetto *et al* (2007) reported that children with ASD avoid several types of foods, such as proteins, but will usually accept foods in the carbohydrate group. In a larger study, Williams *et al* (2006) reported that children with autism demonstrated more food selectivity than typically developing children and that the children with autism preferred energy dense foods within food groups (e.g., chicken nuggets, hotdogs, peanut butter, cake, etc.). It is possible that these eating patterns may contribute to the development of obesity in this population of children. Concerning the effect of health problems on appetite of autistic children the present study raveled that more than three quarter of the parents stated that the positive effect; such as (88.7%) of children had taking medication, gastrointestinal tract infection is problematic for (38.8%) and (9.6%) ear infection while only (8.1%) had complain from asthma. In the same line with study by Williams *et al* (2000) who found that gastrointestinal tract infection is problematic for (17%, 59%) ear infection, and (11%) for asthma. When eating; oral problems are studied Figure (1) the difficulties for families of children with autism become more obvious, the problems reported most often were taking medication, smelling food, mouthing objects, unwillingness to try new foods. One may hypothesize a variety of reasons for the problems described for instance food refusal may be based on issues related sensory difficulties and insistence on sameness. The child may lack of langue to express refusal or negotiate verbally. Also, There was found statistically significant differences between health problems and behavioral problems; include spitting food P=0.006 and smelling food P=0.001.

Concerning the teeth carries 58.0% of the studied children had teeth carries and 24.3% had loss teeth. Because the children eat a lot of carbohydrates, take soda

drink and good appetite during watching TV. Its agree with Amarendra (2012) who reported that most autistic children are observed to be overweight because of overeating. The hypothalamus may not function properly as a result, a child with autism may have the inability to know when they are already full, leading to overeating. Their children enjoy with various sources of stress, problems in communication and social interaction. Children with ASD may also have obsessive behaviors, sensory integration dysfunction. Also, they may see food as something that provides sensory satisfaction, contributing to over eating and weight gaining. Also, Bandini *et al* (2010) reveled that Children with autism were more likely to be obese than children without autism.

CONCLUSION

The present study concluded that children on the autism spectrum demonstrated had a less varied diet feeding behavior in their children reflects limited interests and difficulty in accepting change and types of foods affect on child weight.

Although problem in eating behavior is not a core feature of autism. Clinicians and parents should increase the level of awareness continually as an associate feature in autism. Because eating is an important aspect in childhood, it is necessary to give more attention in eating problems especially in autistic children to prevent failure to thrive that can potentially threaten children's growth and development process. A direct measure with more comprehensive methodology may need to be addressed for more optimal data of eating behavior in autistic children.

RECOMMENDATION

Continuous health education and counseling programs are necessary to improve mother's knowledge toward nutrition of their autistic children, early detection for nutritional problems through systematic assessment and planned screening programs.

REFERENCES

- Ahearn W. An assessment of food acceptance or pervasive developmental disorder-not otherwise specified. J Autism and Dev Disorders. 2001; (31): 505–511.
- Amarendra O. Autism from a Father's Point of View. In Autism. 2012; (6): 24-31.
- American Psychiatric Association: Diagnostic and statistical manual of mental disorders: DSM-5. Washington, DC: American Psychiatric Publ; 2013.
- Attiya O. The efficiency of training program for parents of autistic children in changing their negative attitudes toward their autistic children. Doctoral Thesis, Psychology Department, Faculty of Arts, Ain Shams University, 2006; p. 221– 225.
- Bandini L, Must A, Anderson SE, Curtin C. The prevalence of obesity in children with autism. a secondary data analysis using nationally representative data from the National Survey of Children's Health BMC Pediatrics. 2010; (10):11.
- Bennetto I, Kuscher ES, Hyman SL. Olfaction and taste processing in autism. Biol Psychiatry. 2007; 62(9):1015-1021.
- Bhuvaneswari, J. and Nazni, P. Impact of Breakfast Bar Supplementation on Nutritional And Academic Performance of Adolescence International Journal of Development Research Vol. 1, Issue, 3, pp.018-021, June, 2011 ISSN: 2230-9926
- Carruth B. Prevalence of picky eater among infants and toddler and their caregivers. Decision about offering a new food. J. Am Diet. Assoc. 2003 ;(103): 692-698.
- Charruth B. Revisiting the picky eater phenomenon. Neoophobic behaviors of young children. J. American Collage of Nutr. 2000; (19): 771-780.
- David S, Mandell SD, Maytali M, Novak MA, Cynthia D, Factors Associated With Age of Diagnosis Among Children With Autism Spectrum Disorders. Pediatrics. 2005; 116 (6): 1480 -1486.
- Elbahnasawy HT, Girgis NM. Counseling for Mothers to Cope with their Autistic Children Journal of American Science. 2011; 7(7). http://www.american science.org.
- Fombonne E. Epidemiology of pervasive developmental disorders. Pediatr Res 2009; 65: 591-598.
- Galloway A T. Predictors and consequences of food neophobia and pickiness in young girls. J. Am. Diet. Assoc. 2003; (103): 692-698.
- Herbert MR. Contributions of the environment and environmentally vulnerable physiology to autism spectrum disorders. Curr Opin Neurol. 2010, 23: 103-110.
- Holt R C. Parental Perceptions of Nutritional Status of Children with Autism. Ph.D thesis, July 28. 2008.
- Honda H, Shimizu Y, Imai M, Nitto Y. Cumulative incidence of childhood autism. A total population study of better accuracy and precision. Developmental Medicine and Child Neurology. 2005; (47):10 – 18.
- Horvarth K. Gastrointestinal abnormalities in children with autistic disorder. J Ped. 1999; (135): 559-563
- Jeanne Marshall, Rebecca j. Hill, Jenny Ziviani, Pamela Dodrill. Features of feeding difficulty in children with Autism Spectrum Disorder International Journal of Speech-Language Pathology, 2014; 16(2): 151–158.
- Ledford J. R, Gast D. L. Feeding problems in children with autism spectrum disorders. A review . Focus on Autism and Other Developmental Disabilities. 2006; 21: 153 – 166.

- Levy SE, Mandell DS, Schultz RT: Autism. Lancet 2009, 3 74:1627-1638.
- Lukens C. Development and validation of an inventory to assess mealtime behavior problems in children with autism. J Autism Dev Disord. 2008; (38): 342-352.
- Namal N, Vehit HE, Koksal S. Do autistic children have higher levels of caries? A cross-sectional study in Turkish children. J Indian Soc Pedod Prev Dent. 2007; 25(2):97- 102.
- P.Nazni and J.Bhuvaneswari. Effect of yogic practice on nutritional and academic performance of the selected adolescents International Journal of Food And Nutritional Sciences,Vol.2, Iss.3,(July-Sep) pp.116-119, e-ISSN 2320 –7876 (2013)
- Palmer RF, Blanchard S, Wood R. Proximity to point sources of environmental mercury release as a predictor of autism prevalence. Health Place. 2009; 15(1):18-24.
- Palmer RF, Blanchard S, Stein Z, Mandell D, Miller C. Environmental mercury release, special education rates, and autism disorder: an ecological study of Texas. Health Place. 2006; 12(2):203-209.
- Peerkhan Nazni, Edward Gnanaraj Wesely, Veerappan Nishadevi. Impact of Casein and Gluten Free Dietary Intervention on Selected Autistic Children, Iranian Journal of Pediatrics, Vol.18 (No.3):244-250 (2008).
- Smith AM, Roux S, Naidoo NT, Venter DL. Food choices of tactile defensive children. Nutrition. 2005; 21(1):14-19.
- Vijay Sagar KJ. Research on autism spectrum disorders in India. AP J Psychol Med. 2011; 12 (1): 69–72.
- William K. Comparing selective eaters with and without developmental disabilities. Journal Dev Phys Disabil. 2005; (17): 299-309.
- Williams P. Eating habits of children with autism. Pediatric Nursing. 2000; (26): 259-264.
- Wright, Charlot. How do toddler eating problems relate to their eating behavior. Food preference and growth. Paediatrics. 2007; (120): 1069-1075.
- Wong A. Nursing care of infants and children. 8th ed. USA. 2007: p. 1021-1022.
- Yen L L. Problem eating behavior among young children with normal development in Taipei country. Chin J Public Health. 1994; (13): 95-104.
- Zeglam, Maouna.: Is there a need for a focused health care service for children with autistic spectrum disorders Keyholes look at this problem in Tripoli, Libya. Autism. 2012; 16 (4): 442–447.