Study of Eating Habits for Children with Autism at Assiut City

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Abstract: The aim of this study is to investigate the eating habits for children with autism. A descriptive research design and convenient sample was used in this study. This study was conducted at autism private centers, Female Association in Assuit University, Assuit Rehabilitation center and Sedey Galal Subtends' Health Insurance Clinc in Assiut city. The total number of sample was 112 children diagnosed with autism. To collect data an interview questionnaire was used. It consists of four main parts: part I: includes items related to children's and parents' socio-demographic characteristics. Part II: includes items related to history of disease. Part III: includes items related to child eating habits. Part IV: includes items related to nutritional assessment. Results: More than half of studied children were of aged ranging from 6- <12 years. 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. 41.1% of children had very active level. The majority of the studied sample had good appetite for specific food and all children favorite carbohydrate; therefore (60.7%) of them did not receive balanced diet. Also; nearly half of children (46.4%) had good eating during watching TV. The majority of children received medication that affect their appetite. As regards BMI, 42.0% 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. 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.

[Emad Abd El-haliem, Soaad Abed El hamed Sharkawy; Amal Ahmed Mobarak and Nahed Thabet Mohamed. **Study of Eating Habits for Children with Autism at Assiut City.** *J Am Sci* 2013;9(11):485-496]. (ISSN: 1545-1003). http://www.jofamericanscience.org. 62

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

1. Introduction

Autism is a complex developmental condition that typically manifests in the first three years of life. which is found that almost five times as many boys were being identified with (ASDs) as girls (1 in 54 compared to 1 in 252) Centers for Disease Control and Prevention **(CDC, 2012a).** The (CDC) estimates that about 1in 88 children have been identified with an autism spectrum disorder (ASD). In 2009, CDC's Autism Development Diseases Management (ADDM) Network first reported that about 1 in 150 children had an ASD. Then, in 2009, DDM Network reported that 1 in 110 children had an (ASD). Most recently, the ADDM Network reported that 1 in 88 children had an (ASD). This means that the estimated prevalence of (ASDs) increased 23% during 2006 to 2008 and 78% during 2002 to 2008 **(CDC, 2009 & CDC, 2012b).**

Prevalence of autism spectrum disorders among children with developmental disorders in Egypt and Tunisia were documented to be 33.6% and 11.5% respectively **(Seif Eldin et al., 2008 &Williams et al., 2008):** The prevalence and characteristics of autistic spectrum disorders in. In Egypt, extrapolated prevalence is 152,234 with boys **(US Census Bureau, Population Estimates, 2008).** The incidence rate for autism is about 6.7:1000 children. The ratio of mal to female children is 2.8 to 5.5:1 **(CDC, 2009).** In a clinic based population study in south-eastern Nigeria, prevalence of autism spectrum disorders had been noted to be 0.8% of the total population of children that attended the clinic over a one year period **(Bakare** et al., **2011a).**

The causes of autism include genetics and environmental factors. Genetics autism have been shown to be complex and it is unclear whether the disease is due to gene mutation or multi-gene interactions; nor has autism been traced to a single gene mutation or interaction **(http://helty.yahoo.com/ency/healths/2006). Abrham, & Geschwind, 2008).** Environmental factors include infectious disease, heavy metals, alcohol, smoking, illicit drugs and vaccinations. The theory on vaccines is directed toward the Measles, Mumps and Rubella (MMR) vaccine **(Young et al., 2008).** The parental characteristics, such as age and

level of education, may be associated with a risk of autism. However, results from studies of parental age and autism are inconsistent **(Sasanfar et al., 2010).**

In general, there seem to be two patterns of development and onset for children with autism. In some children, development appears to be unusual in some respect right from birth. Often, parents observe that their children do not babble, produce words and use gestures such as pointing with the expected frequency. In other children, development appears near normal through 12-18 months. These children interact with adults in the environment, use some speech to communicate, and show an interest in their social surroundings, though they may be a little behind their age. Then, at around 18 months of age, the difference in their abilities becomes evident. In some cases, an event in their environment seems to trigger a loss in the acquired skills such as speech and interaction from what we have observed **(http: //www. What is Autism, 2008. Barua & Daley, 2008).**

Autism involves behavioral, medical and psychological effects which have been found to be connected to nutrition. Many children with autism have an underdeveloped gastrointestinal tract leading to feeding behaviors such as constipation, regurgitation, rumination and selective eating. The underdeveloped gastrointestinal tract has thin mucosa lining, allowing food molecules to be absorbed in the blood stream prematurely; it also causes inflammation and irritation. Behaviors may be a result of irritability due to inflammation and difficulty digesting food. In addition, the underdeveloped gastrointestinal tract is responsible for the deficiency of several essential nutrients, of which symptoms may mimic neuro-developmental disorders.

The most common deficiencies found in children with Autism include vitamin A, vitamin C, thiamin, riboflavin, niacin, folic acid, vitamin B6, vitamin B12, calcium and iron. These missing vitamins and minerals exacerbate feeding behaviors as well as cause a decline in overall health **(CDC, 2009).**

Chewing problems and behavioral problems have been identified as common in children with autism and disabilities in early childhood. This is also due to the increased risk of developmental and motor skills delays as also the emotional responses linked to nutrition is a lack of the chemical, serotonin. **(Collins et al., 2003).**

Studies of food intake, feeding behaviors and nutrient-drug interactions will increase the understanding of the needs of this population. Children with autism exhibit feeding behaviors and emotional responses as a result of their underdeveloped gastrointestinal tract and difficulties with digestion. Limited food preferences are often an issue in feeding behaviors in children with autism **(Collins et al., 2003).** This may be mild to severe, where the child may prefer only one or two foods, or only one type of texture. This restriction becomes a threat to nutritional status as it limits a necessary variety of nutrients consumed. Regurgitation, rumination and pica are also common in children with autism. The child may expel food back from the stomach and esophagus (regurgitation) or continually chew the food (rumination). Some children have also been known to ingest non-food items such as dirt, paper or plastic (pica) **(Holt, 2008).**

In addition to limited preferences, regurgitation and rumination, emotional behaviors complicate feeding. As the child feels uncomfortable or threatened or over stimulated due to anxiety, she or he may often act out, throwing food, crying, spitting biting or fussing in general. **(Warren et al., 2008).** Ritualistic behavior is a common observation in children with autism, especially at mealtime. Children with autism have been shown to marginally exhibit more limited food choices and more difficult feeding behaviors than their siblings or matched typically developing children **(Martins et al., 2008).**

Environment has been identified as a major factor in mealtime behavior. Typical children have been shown to exhibit different food preferences as well. Time of day has determined food acceptability in children ages 3-5 years in terms of food preferences and types of foods consumed. Similarly in children with autism, the environment and time of day affects mealtime choices. Although preference of breakfast or lunch foods and time of day has not been studied in children with autism, **(Holt, 2008).**

When children are initially diagnosed with autism, parents need an extensive amount of emotional support, professional guidance, and education about the disorder while they are attempting to adjust to the diagnosis. There is no medication or treatments available to cure autism. Many families are drawn to the use of complimentary and alternative medical therapies in attempts to treat their autistic children. They use vitamins and nutritional supplements, herbs or restrictive diets, music therapy, art therapy and sensory integration techniques. To date, these therapies have not been scientifically proven to improve autism **(Klossner & Hatified, 2010).**

Medications are prescribed to help combat the impulsivity, hyperactivity and short attention span observed in children with autism. Antidepressants, anti-anxiety and mood stabilizing drugs prescribed have a nutritional effect on the child. Neuro-leptics, or anti-psychotics, such as Risperidol and Geodon,

are responsible for excessive weight gain by increasing appetite, altered metabolism of nutrients as well as overall nutritional status and developing risks for cardiac and glucose dysfunction **(Myers & Johnson, 2007., King et al., 2009,).**

The nurse assesses the child's functional status, including; behavior nutrition, sleep, speech/ language, education needs, developmental and neurologic limitations **(Giareli et al., 2005, Johnson & Myers, 2007).** Through physical examination the nurse observes the infant or toddler for lack of eye contact, failure to look at objects pointed by examiner failure to point to himself, failure to let his needs be known and unusual behavior. Measure growth parameters, in particular noting head circumference. Not the presence of large prominent or posterior rotated ears. Examine the skin for hypo or hyperpigmented lesions. Not asymmetry of nerve function or palsy. Hypertonia, hypotonia, toe-walking and loose gait or poor coordination **(Ricci, & Hodopp, 2009).**

The nurse must be educate the parents about the eating habits and problems and other issues may occur in the area of sensory processing. For example, if children with ASD are hypersensitive to sounds, they may not want to eat in a noisy area or with others engaged in conversation. If they have visual sensitivities, they may accept foods only of certain colors. They also may not be able to eat foods that are touching each other on their plate. Some children are sensitive to the way foods feel in their mouth. They may avoid crunchy foods or foods that have a slick mouth feel. The way food smells can cause similar reactions, and there are instances in which children may not recognize certain tastes but can distinguish between others **(Ray & Rutherford, 2009, Geraghty et al., 2010).**

Care must be taken when performing procedure or administering medicine to feeding these children, because they either fussy eater or who may willfully starve themselves or gag to prevent eating or indiscrimination hoarders who swallow any available edible or inedible item, such as thermometer **(Montes & Halterman, 2007, Wong, 2007).**

Significance of the study:

Autism is a complex developmental disorder that is usually the first noticed within the first few years of life **(Allender et al., 2010).** Anecdotally, it has long been noted that many children with autism have feeding difficulties, with highly restricted rang of food choices. Eating habits patterns are often unusual and have impact on family life. Many of these youngsters have an extremely limited food repertoire, which is likely related to sensory regularity difficulties, desire for sameness, or other issues **(Ricci & Hodopp, 2009).** Less attention has been paid to how the social and behavioral aspects of children with autism contribute to the eating problems reported by parents. It was 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 **(William et al., 2005).**

Aims of the study

1-To assess eating habits for autistic children.
2-To identify health / behavior problems which affect the eating patterns for autistic children.
3-To assess the anthropometric measurements as (weight, height, and body mass index).

2. Subjects and Method:

Research design: descriptive research design was used in this study.

Setting:

This study was conducted at three autism private centers namely Al sama, Al saad and Awladna centers; two associations: Female and Kayan Associations; three public units which were General Conversational Unit at Assiut University Hospital, Assuit Rehabilitation Center and Seedy Galal students' Health Insurance Clinic.

Sample:

A convenient sample was used in this study. It includes all parents of children diagnosed with autism in previous mentioned setting. The total number of sample was 112 autistic children distributed as the following: Al sama Center (5 children), Al saad Center (10 children), Awladna center (10 children), Assiut Rehabilitation Center (18 children), Female Association (18 children), Kayan Association (18 children), General Conversational Unit at Assiut University Hospital (20 children) and Seedy Galal students' Health Assurance Clinic (13 children).

Inclusion criteria:

- Children diagnosed with autism.
- The children aged from 2.5 year to 18 years.
- Both sex.

Exclusion criteria:

Children with Attention Deficit Disorder

Tools of the study:

An interview questionnaire was developed by the researchers based on a review of relevant literature to elicit information from parents or caregivers.

2.Method of data collection:

I. Preparatory phase:

An official approval letter was obtained from the Dean of Faculty of Nursing, Assiut University, to the directors of Autism private Centers, association and public units in Assiut city, Assuit

Rehabilitation center, Seedy Galal students' Health Assurance Clinic and chairmen General Conversational Unit at Assiut University Hospital to obtain their vital assistance and necessary approval to conduct the study.

II. Pilot study:

A pilot study was conducted to evaluate the applicability and clarity of the questionnaire and time needed to fulfill it. It was carried out on a sample of the parents of 12 children suffering from Autism. These 12 children were excluded from the actual sample. According to the result of pilot study the necessary modifications were done.

III. Data collection:

The researchers interviewed the participant on an individual basis in special place. The researchers introduce herself to the participant and explain the purpose of the study to them. The researchers completed the questionnaire for all children Also, measures child height and weight to determine body mass index, finally the researchers started to collect data from the first of September 2011, until the end of May 2012. Each interview took about (20-30) minutes according to the response of the participant. 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.

IV. Ethical consideration:

Oral consent was obtained from each participant after explaining to them the purpose of the study. They were reassured about the confidentiality of the obtained information.

VI. Statistical analysis:

The obtained data were reviewed, prepared for computer processing, coded, analyzed and tabulated. Data entry was done using the computer software package, while statistical analysis was done using the SPSS 16.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies, percentages, means, standard deviations and using chi-square test. Statistical significance was considered at P- value <0.05.

Obstacles and limitations of the study:

1-The participant felt with shame from disease, fear from visitors, uncooperative and their response with the researchers was more difficult.

2-The researchers spent more time to measure child weight and height because the child because of the nature of autistic child.

3. Results

Table (1): Shows the socio demographic characteristics of parents and their children with autism. As regarding the age of children more than half of them (51.8%) their age ranged from 6- <12 years, the majority of them (85.7%) where male and (44.6%)had second birth order. The vast majority of children (89.3%) live in urban area. Also, the present study represent (69.6%) of mother and (75.5%) of father had graduating from university, master and doctor degree level of education and more than two third (67.8%) worked mother while the majority of father (92.9%) governmental working.

Table (2): Distribution of motor development, activity level and current child's behavior among autistic children. Regarding to child motor development it was found the majority (87.5%) of the children walk alone and more than half of them (51.8%) unable to speak first word. Concerning child activity level shows that (41.1%) of children had very active level and only (3.6%) had quiet level. As regard child behavior more than two third of the children (69.6%) had obey simple order and about one third (30.4%) of them had non communication with the family.

Table (3): Distribution of the current eating behavior among autistic children. Regarding the number of meals it was observed that more than half (53.6%) of children had take 1-3 meals per day and the majority (85.7%) of the children had good appetite for specific food. Concerning types of favorite diet shows that (100.0%) of children had take carbohydrate; therefore (60.7%) of them had not take balanced diet. Also; nearly half of children (46.4%) had good eat when alone and only (19.6%) of them eat during watching TV. More than one third of autistic children in the present study (39.3%) had eat from the floor fore many causes such as favorite taste and smell.

As regard to the effect of health problems on appetite of autistic children table (4) indicates that more than two third of them (78.6%) the parents stated that the health problem affect on their children appetite. Such as (82.1%) of children had taking medication followed by (37.5%) had complain from

GIT. And there was a statistically significance deference between health problems and appetite P= 0.001.

Figure (1): Shows the distribution of habits/problems among autistic children. It was found that more than half of children (51.8% and 55.4%) respectively had smelling food and taking medication while only (8.9%) of them had spitting food.

Figure (2): Assessment of nutritional status for children with autism according to BMI and teething condition. As regard with BMI, it was found that (42.0%) of the studied children were over weight and (15.2%) had obese. Concerning the teeth condition (66.1%) of the children had teeth carries while (12.5%) had carries and loss teeth.

Table (1): Socio demographic characteristics of children with Autism and their parents.

Characteristics	No	%
Age:		
3 - < 6 years	30	26.8
6 - < 12 years	58	51.8
12 years or more	24	21.4
MS±SD	9.1071±5.36733	
Gender:		
Male	96	85.7
Female	16	14.3
Birth order:		
First	28	25
Second	50	44.6
Third or more	34	30.4
Residence:		
Urban	100	89.3
Rural	12	10.7
Mother's education:		
illiterate & primary	10	8.9
Secondary & technical institute	24	21.4
University, Master and doctor degree	78	69.6
Mother's occupation:		
working	76	67.8
Not working	36	32.2
Father's education:		
illiterate & primary	2	1.8
Secondary & technical institute	26	23.2
University, Master and doctor degree	84	75.5
Father's occupation:		
Governmental	104	92.9
Non governmental	8	7.1

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

Items	No	%
Motor development:#		
Walk alone	98	87.5
Self eating	66	58.9
Unable to dressing	84	75.0
Unable to speak first word	58	51.8
Unable to speak first sentence	74	66.1
Child's activity level:		
Extremely active	14	12.5
Very active	46	41.1
Moderately active	38	33.9
Active	4	3.6
Quiet	4	3.6
Lethargic	6	5.4
Child's behavior:#		
Non communication with the family	34	30.4
Obey simple order	78	69.6
Lack in speech and languch	76	67.9
Difficult direct, indirect communication	46	41.1
Repeated stereotype	64	57.1
Failed in relation with friends	76	67.9
Unable to participate others in activities	74	66.1
Repeated some behavioral as the same style	72	64.3

#More than answer

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

Items	No	%
Number of meal:		
1- 3 meals/ day.	60	53.6
4 and more meals/day.	52	46.4
Child's appetite:		
loss of appetite	6	5.4
Good appetite for specific food	96	85.7
Good appetite for all food	10	8.9
Type of favorite diet :##		
Carbohydrate	112	100.0
Protein	52	46.4
Fat	30	26.8
Vitamins and minerals	46	41.1
Soda drink	72	64.3
Balanced diet:		
Yes	44	39.3
No	68	60.7
Time of good child eat:		
During watching TV	22	19.6
Alone	52	46.4
Within group	40	35.7
Child had eat from the floor:	44	39.3
Causes of child eat from floor :##		
Taste	38	86.3
Smell	20	45.4
Touch	2	4.5
Temperature	2	4.5
Appearance	4	9.1

More than answer

Table (4): Distribution of common health problems among of autistic children.

Items	No	%
Problems:		
Having to take medication	92	82.1
Asthma	8	7.1
Ear infection	10	8.9
Hospitalizations	6	5.4
GIT	42	37.5
Psychological	14	12.5
Convulsion	10	8.9
Total number:	88	78.6

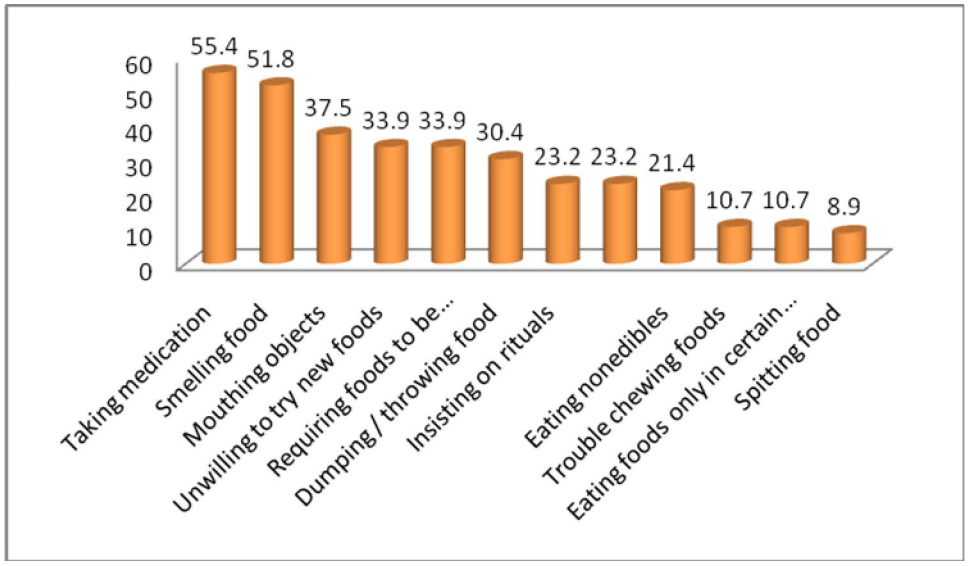

Figure (1): Distribution of habits / problems among autistic children

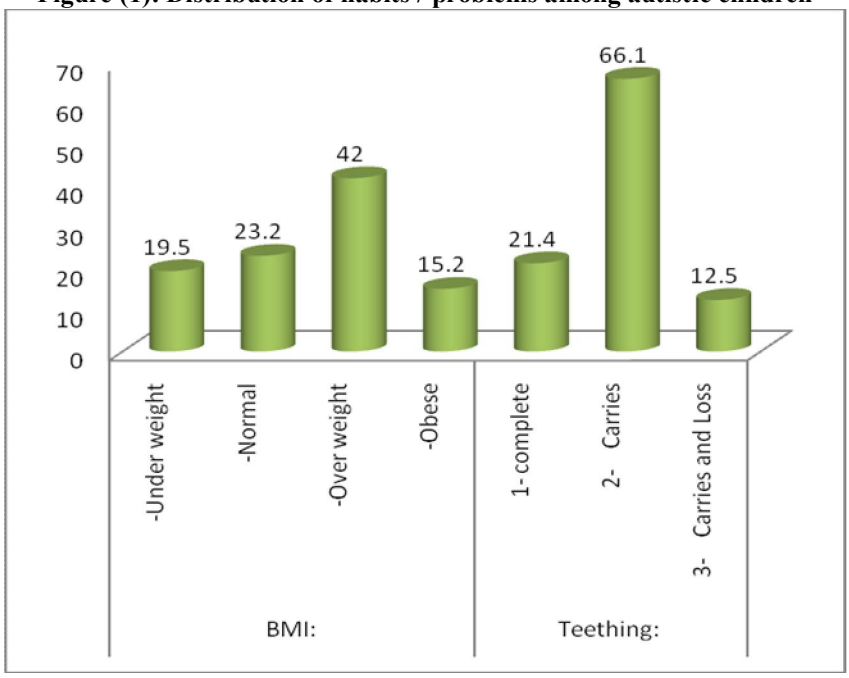

Figure (2): Assessment of nutritional status for autistic children according to BMI and teething conditions

Table (5): The relation between current child activity level and child appetite among autistic children. It was observed that (41.7% and 37.5%) respectively of children taking specific food had very and moderate active. There was found statistically significant differences between child activity level and child appetite P= 0.001.

Figure (3): The relation between the child appetite and health problems among autistic children. There was found statistically significant differences between child appetite and health problems in children (take medication and GIT problems) P= 0.001.

Table (6): The relation between health problems and behavioral problems among autistic children. There was found statistically significant differences between health problems and behavioral problems; include spitting food P=0.006 and smelling food P=0.001.

Table (5): The relation between current child activity level and Child appetite among autistic children.

Child activity level	Child appetite								P. value
	Loss of appetite		Good appetite for specific food		Good appetite for all food		Total		
	No	%	No	%	No	%	No	%	
Hyper active	0	0.0	12	12.5	2	20.0	14	12.5	
Very active	2	33.3	40	41.7	4	40.0	46	41.1	
Moderate active	2	33.3	36	37.5	0	0.0	38	33.9	
Active	0	0.0	4	4.2	0	0.0	4	3.6	0.001*
Calm	0	0.0	2	2.1	2	20.0	4	3.6	
Lethargy	2	33.3	2	2.1	2	20.0	6	5.4	
Total	6	100.0	96	100.0	10	100.0	112	100.0	

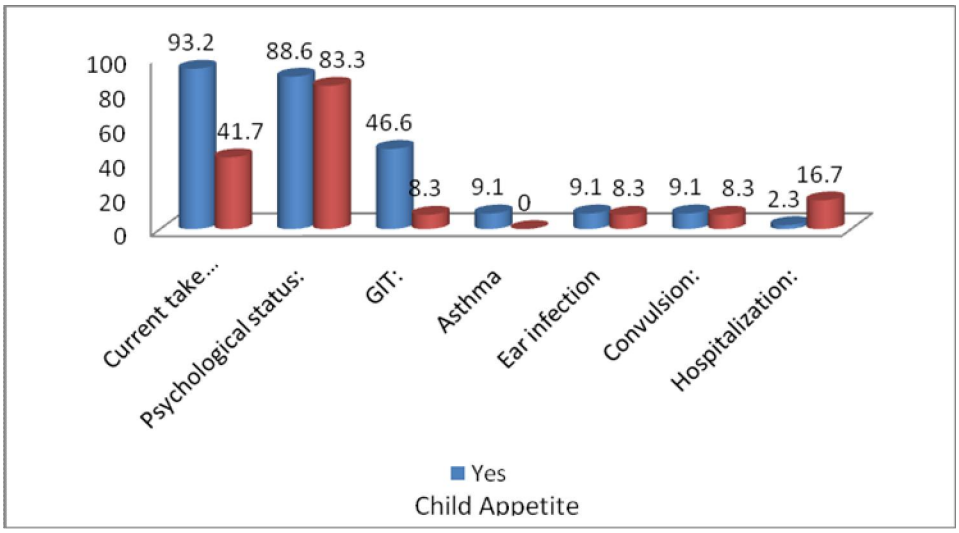

Figure (3): The relation between the child appetite and health problems among autistic children.

Table (6): The relation between health problems and behavior problems among autistic children.

Behavior problems#	Health problems				P. value
	Yes		No		
	No	%	No	%	
Insisting on rituals.	23	26.1	4	16.7	0.25
Trouble chewing foods.	8	9.1	4	16.7	0.236
Holding foods in mother cheeks.	19	21.6	6	25.0	0.457
Spitting food.	4	4.5	6	25.0	0.006*
Dumping / throwing food.	29	33.0	4	16.7	0.094
Eating non edibles.	16	18.2	8	33.3	0.096
Mouthing objectives.	29	33.0	12	50.0	0.098
Smelling food.	35	39.8	22	91.7	0.001*
Taking medication.	53	60.2	8	33.3	0.017
Eating foods only in certain places.	8	9.1	4	16.7	0.236
Unwilling to try new foods.	32	36.4	6	25.0	0.214
Requiring foods to be prepared in certain ways.	28	31.8	10	41.7	0.252

#More than answer

4.Discussion

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 & Maouna, 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).**

The aim of the study to investigate the eating habits and health problems which affect the eating patterns for autistic children and their growth. 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 3 < 6 years with the mean age was 9.1± 5.3 years, this finding inagraement with **(Elbahnasawy & Girgis, 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 (85.7%) where male this result agree with **Elbahnasawy & Girgis (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 (44.6%) of children had second birth order. This finding in accordance with **Elbahnasawy & Girgis (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**. Becker, (2010) Rosenberg et al. (2009) & Lewandowski et al. (2009)** This may suggested that potentially increased autism risk as a result of urbanicity 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 parent were highly educated and more than half were housewives. **Elbahnasawy & Girgis (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 Near-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 non communication with the family. **Curtin et al. (2010)** 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 (12.5 %, 41.1%, 33.9%, 3.6%, 3.6% and 5.4%) 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. In tables (2 and 5). 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 **(Emond, 2010).**

Concerning the eating behavior among child in the present study (**T**able 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 (46.4%) of total sample had good eat during watching television. Its may be attributed by eat during watching television seek attention of children appetite centers. More over the prevalence of eating from the floor were (39.3%), it may attributed by the child has eating from the floor for causes for taste (86.3%) and (45.4%) for good smell and therefore it leads to (37.5%) had complain gastrointestinal problems In table (4). it is agree with **William et al. (2000)** who found that two third reported picky eating for the taste and smell. Also, it agree with **Wakefield (2002)** who found that there are well identified links gastrointestinal disease and symptomatic autism.

In the present study all studied children eat a lot of carbohydrates and (64.3%) of children take soda drink. It is agree 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, **Schreck & Williams (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 (82.1%) of children had taking medication, gastrointestinal tract infection is problematic for (37.5%) and (8.9%) ear infection while only (7.1%) 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 (55.4%) taking medication, (51.8%) smelling food, (37.5%) mouthing objects, (33.9%) 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.

Figure (2): concerning to the body mass index of the studied sample was representing that (42.0%) of the studied children was over weight and (15.2%) were obese. Concerning the teeth carries 66.1% of the studied children had teeth carries and 12.5% 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.

Concerning the current health problems which affect on eating pattern among autistic children **Figure (3)** was observed that the majority of children had problems taking medication and there is statistically association between appetite and taking medication. It is in the same line with **William et al. (2000)** who revealed that the majority of children had problems taking medication and there is statistically association between appetite and problems taking medication. Also, **(Autism Society of America, 2008)**. Who mentioned that the medications were carefully reviewed with respect to their effects on food intake and Twenty-three children took medications that may suppress food intake.

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.

Recommendations:

Based on the results of the present study, it was recommended that:

- Continuous health education and counseling programs are necessary to improve mother's knowledge toward nutrition of their autistic children.
- Early detection for nutrition problems through systematic assessment and planned screening programs.
- Media awareness to aid health team professionals in prompting tolerance and understanding of autism with a clear explanation and a focus on increasing awareness.
- Additional researches are needed to identify most common child eating problems and aid in the development of strategies to facilitate appropriate eating habits and promote social aspects of mealtimes in this population.

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11/12/2013