

Original Article

Determination of Nutritional Behaviors of Children with and without Autism Spectrum Disorder and Supplementary Practices of Parents

Funda Aslan, RN, MsN, PhD (c)

Hacettepe University, Nursing Faculty, Public Health Nursing Department, Ankara, Turkey

Hilal Ozcebe, PhD

Professor, University of Hacettepe, Faculty of Medicine, Department of Public Health, Ankara, Turkey

Funda Aslan, RN, MsN, PhD (c), Hacettepe University, Nursing Faculty, Public Health Nursing Department, Ankara, Turkey E-mail: fundaaaslan03@gmail.com funda.aslan@hacettepe.edu.tr

Abstract

Background: Nutrition is an integral part of growth and development for all children. It is reported that the dietary behaviors and metabolic conditions in children with autism show many differences with respect to normal children.

Objectives: This study was conducted with the aim of determining the feeding behaviors of the autistic and non-autistic children and their parent's feeding behavior.

Design and Sample: Comparative – descriptive study of the parents of 73 autistic children are involved as case group and the parents of 82 non – autistic children.

Results: No significant difference in the behaviors of the parents except for their encouraging nutrition behavior ($t = 7.8, p < .05$) was received as a result of the analysis whether there was a statistical difference between the nutrition and feeding behaviors of children with autism and normal development children and their parents, which was one of the questions of the study.

Conclusion: This study showed that under the scope of primary care and health nurses working at schools, should not ignore that particularly those with special needs, all parents may have problems at this point and that they should provide effective counseling in all settings and schools where they offer health care.

Key Words: *Autism, nutrition, feeding, parents*

Introduction

Autism Spectrum Disorder (ASD) is characterized by significant deficits in social-communication skills, limited repetitive behaviors, and limited areas of interest (Association, 2013). The increase in incidence over the past two decades has made this disorder an important public health problem (Hampson and Blatt, 2015). Autism Spectrum Disorder is a disorder combined with multiple problems and the most important of such problems are the ones related to dietary behaviors as reported by nearly 90% of the care givers. It is reported that the dietary behaviors and metabolic conditions in children with autism show many differences compared to normal children.

The dietary behaviors, impacted by various neurologically preparative, may constitute an impediment to sufficient and healthy

nourishment and thus adequate growth and development in children who have this disorder. So, this case makes the children more vulnerable to malnutrition and obesity. It is reported in the studies, that children with autism spectrum disorders experience nutrition-related problems more often than children with normal development (Sharp et al., 2013, Lockner et al., 2008). Behaviors such as selective eating, not consuming new foods, uniform nutrition, consuming more salty and sugary (with energy density) foods, refusal of fruits and vegetables are the most important factors that diminish the quality of nutrition for kids (Bandini et al., 2010). For this reason, in addition to carrying the same risks as children with normal development, due to such existing risks, children having autism spectrum tend more to gain unhealthy weight (Ahearn et al., 2001, Bicer and Alsaffar, 2013, Evans et al., 2012). In literature about the issue, it

is reported that the frequency of overweight and obesity in the children with autism spectrum disorders is greater (Hill et al., 2015, Broder-Fingert et al., 2014), and intake of calcium and protein is less than the children with normal development because of not consuming the nutrient contents required for growing and development (Shmaya et al., 2015).

It is noted that there are many factors affecting nutritional status in autistic children. Such factors are classified under two headings: medical / nutritional and behavioral. Medical / nutritional factors contain food allergies, symptoms related to the gastrointestinal tract, while the behavioral factors consist of problematic dietary behaviors, sensory processing difficulties, i.e. factors relating to the child individually but also to the family (Geraghty et al., 2010)

It is reported that the parents with autistic children often describe their children's nutritional processes as being more problematic than those of normal children (Herndon et al., 2009, Lane et al., 2010). When the related literature is reviewed, it can be seen that the dietary problems related to autism spectrum disorders have been shown in many studies (Sharp et al., 2013) but when other literature is reviewed; the number of studies that provide the opportunity to compare with normal children to show what problems are in parental behaviors, which is an important factor in the feeding of children with the autism spectrum, was rather less (Sharp et al., 2013, Schreck et al., 2004, Martins et al., 2008), whereas such studies were carried out in our country only with the autistic children and their families (Girli et al., 2016). In this context, it is emphasized that a study for identifying the eating behaviors of normal children and feeding behaviors of their parents is important to show the differences and reveal the current need in actual dimensions (Martins et al., 2008)

In all health care settings, the nurses play an important role in the orientation and education of the children with autism spectrum disorders and their parents (Kral et al., 2013). The National Association of School Nurses (NASN) and Council on School Health (American Academy of Pediatrics (AAP)) underlines that the involvement of school nurses is in the health program development and implementation, including protective education and counseling, but their participation is more important for those children with special needs (NASN, 2005,

Gereige et al., 2017). In this context, it is expected that the results of this study will provide guidance to nurses about how to develop an approach to parents with autistic children and parents of children with normal development.

Purpose of the study

Nutrition is an integral part of growth and development for all children. The study aims to show how the dietary behaviors of the children and their parents' own feeding behaviors in the countries like ours, where there is a high proportions of parents who do not want to accept that their autistic children are disabled, compared to the parents of children with normal development.

Questions of the research

- Are feeding behaviors of parents with autistic children different from who have normal parents?
- Are dietary behaviors of autistic children and normal children different?
- Is there a relationship between nutrition of children and feeding behaviors of parents?

Key Notes

- Nutrition is at the top of the problems experienced by children with autism and the feeding behaviors of parents are critical for solution of this problem.
- It is important for families of autistic children in our country to perceive these problems as compared to those of normal-growing children. Because in our country some parents who have autistic children, unaware their children special needs.

METHODS

Participants

The sample groups of the study consists of the parents of children, aged between 7 and 12, studying at the first and second level of five education centers for autistic children in Ankara under the Ministry of National Education 7-12 (n = 73) and parents of children, aged between 7 and 12, and studying at an elementary school in the province of Yenimahalle (n = 82). In the sampling group of the study, which is planned as comparative, definitive type, the parents of the children diagnosed with autism constitute the case group and the parents of normal primary school students constituted the control group.

The primary school, which is similar to the socio-economic level of the schools where the children diagnosed with autism study at the 1 and 2 level and representing the case group, has been specified as the control group. Thus, the parents of 73 autistic children are involved as case group and the parents of 82 normal developing children are involved as the control group in the study based on their written and verbal consent.

Instruments

Socio-demographic data form is a questionnaire, prepared by the researchers based on the literature and includes data such as age, gender, economic status and the number of siblings of the child (Sharp et al., 2013, Hyman et al., 2012, Girli et al., 2016)). Two scales were used for the aim of specifying the dietary behaviors of children and feeding practices of the families. The first scale, which was designed to determine the eating behaviors of children, was developed in England by Wardle et al. in 2001 **CEBQ (Children's Eating Behavior Questionnaire)** and is a Likert type survey for the responds of parents, containing 8 sub-categories, translated into many languages, used in various studies, comprehensive, assessing the eating behaviors of children over 5 scores (1 = never - 5 = always) in 35 different items. It has been adapted into Turkish by Yilmaz et al (2011). The Cronbach's alpha coefficients ranged from 0.61 to 0.84

The second scale, **PFSQ (Parent's Feeding Style Questionnaire)** is for determining the feeding styles of parents; developed by Wardle et al in 2002, and is a Likert type survey for the responds of parents, containing 5 sub-categories, assessing the feeding behaviors of the parents over 5 scores (1 = never - 5 = always) in 27 different items. The adaptation to Turkish (EBTA) was carried out by Ozcetin et al. (2010). The Cronbach's alpha coefficients ranged from 0.54 to 0.83. Authorizations were obtained from the authors who performed the adaptation study in both scales.

Procedure

Questionnaires have been applied to participants by researcher on the days specified with education Centers for autistic children applied the written permissions of Hacettepe University Non-Interventional Ethics Board Unit as well as of the Ministry of National Education for the schools, where the study was performed, have been received in order to be able to carry out the

research. At the same time, written and verbal approvals of the parents who agreed to participate in the study were obtained too.

Data Analysis

Statistical analyzes were performed in the IBM SPSS program version 23. The categorical variables used in the analysis have been given as figures (percent), and continuous variables as mean \pm standard deviation. Shapiro-Wilk and Kolmogorov-Smirnov tests have been used to control the compliance of distribution of continuous variables with the normal distribution. For the continuous variables complying with normal distribution, the t test has been performed on two independent groups, whereas comparisons of more than two independent groups have been reviewed with Kruskal -Wallis test for the continuous variables, not complying with normal distribution; the comparison of more than two independent groups have been reviewed under one-way analysis of variance (ANOVA). Statistical confidence interval was obtained as $p < .05$.

Results

The study has been carried out with a total of 155 parents of children with autism and children with normal development. While 49.3% of the parents of children with autism stated that they had a problem with feeding; 54.% of the parents of children with normal development reported to have problems with feeding their children

No significant difference in the behaviors of the parents except for their encouraging nutrition behavior ($t = 7.8, p < .05$) was received as a result of the analysis whether there was a difference between the nutrition and feeding behaviors of children with autism and normal development children and their parents, which was one of the questions of the study. It has been found that the only significant difference was in encouraging parenting behavior, where it was found to be higher in parents of autistic children than children with normal development (*see Table 2.*)

The eating behaviors of children and feeding behaviors of the parents in both groups have been analyzed according to the their problems in the feeding process. Accordingly, while no significant difference was found in both scales and sub-categories according to problems experienced by the parents of the normal developing children, the parents of the children with autism, who replied "No" to the question

about experiencing problems in the feeding process, showed rather the behavior of encouraging feeding and that was the only sub-category where a significant difference was found ($t = -2.13$, $p = .037$, $p < .05$).

Again, no statistically significant difference was found between the age of the children and the feeding patterns of the children and the feeding styles of the families in either group.

Table 1. Some Sociodemographic Characteristics of Parents and Children

	Autistic children and their parents (n = 73)		Children with normal development and their parents (n =82)	
	n	%	n	%
Parental age group				
28 - 33	11	15.1	12	6.14
34 - 39	28	41.1	32	39.0
40 -45	25	34.2	30	36.6
> = 46	7	9.6	8	9.8
Mother's educational status				
Primary school	36	49.3	46	56.1
Middle School	25	34.3	29	35.4
High school	12	16.4	7	8.5
Mother 's working status				
Yes	10	13.7	8	9.8
No	63	86.3	74	90.2
Father's educational Status				
Primary school	20	27.4	25	30.5
Middle School	33	45.2	45	54.9
High school	20	27.4	12	6.14
Father 's working status				
Yes	64	87.7	72	87.8
No	9	3.12	10	12.2
Detected income status				
Good	10	13.7	8	9.8
Middle	58	79.5	66	80.5
Bad	5	6.8	8	9.8
Parents experiences of problems about feeding				
Yes	36	49.3	45	54.9
No	37	50.7	37	45.1
Age group of children				
7-9	19	26.0	25	30.5
10 -12	54	74.0	57	69.5
Gender of children				
Female	39	47.6	44	53.7
Male	34	41.5	38	46.3
Total	73	100.0	82	100.0

Table 2. Eating behaviors of children with autism and normal development; feeding behaviors of their parents

	Autistic children (n = 73)		Children with Normal Development (n =82)		t - p
Nutritional behaviors in children					
Food enthusiast	13.7	5.2	13.5	5.0	.20 -.84
Emotional overeating	8.8	3.9	8.9	3.8	-.17 -.85
Enjoying the food	17.1	5.3	16.4	5.3	.85 -.39
Passion to drink	8.5	3.5	8.6	3.6	-.13 -.89
Enthusiastic of fullness	18.0	3.8	18.1	4.3	-.09 -.92
Eating slowly	9.1	3.2	9.4	3.7	-.54 -.59
Emotional low eating -	10.7	3.3	5.10		.22 -.82
Food Selection	7.3	2.9	7.5	2.8	-.39 -.72
Parental feeding behavior					
Emotional Feeding	14.3	3.5	14.4	3.6	-.17 -.86
Assistive feeding	11.9	2.3	11.6	3.9	.73 -.46
Encouraging Feeding	28.1	5.1	22.0	4.5	7.8 -.00*
Tightly Controlled Feeding	14.7	3.3	13.8	3.4	1.7 -.08
Tolerant Feeding	6.13	3.1	14.4	3.0	-.15 -.14

* $p < 0.01$

Table. 3. Correlation of Parents' Feeding and Nutritional Behavior of Children

	Gh	Day	Gka	ICT	Th	Yy	Dazy	Ys	Db	Yb	Cb	SBP	Tkb
Parents of Autistic Children													
Food enthusiast (Gh)	1												
Emotional Low Eating (Day)	0.78**	1											
Enjoying the food (GKA)	12.41 **	12.37 **	1										
Passion to drink (King, Souders et al.)	12.46 **	12.37 **	12.16	1									
Enthusiastic of fullness (Th)	-0.17	-0.15	-0.13	12.03	1								
Slow Eating (Bohanny et al.)	-0.35	-0.30	-0.38 **	-0.08	12.33 **	1							
Emotional low eating - (Dazy)	-0.39	-0.06	-0.20	12.17	12.30 **	0.12	1						
Food Selection (Bicer and Alsaffar)	12.16	0.19	0.13	12.26 *	-0.20	-0.10	0.05	1					
Emotional Feeding (Db)	0.18	0.14	-0.09	12.09	12.26 *	-0.05	12.15	0.00	1				
Assistive Supply (Yb)	12.10	0.08	12.07	0.19	12.59 **	-0.35 **	12.41 **	-0.28 *	12.28 *	1			
Encouraging Feeding (Cb)	-0.07	-0.07	-0.05	0.05	12.25 *	0.06	-0.07	-0.08	12.45 **	12.17	1		
Tightly Controlled Feeding (Skb)	-0.16	-0.12	-0.04	-0.13	12.03	0.00	-0.07	0.12	0.11	-0.18	12.53 **	1	
Tolerant Controlled Feeding (Tkb)	-0.02	-0.07	-0.08	0.18	12.21	-0.01	-0.11	0.11	12.37 **	-0.03	12.04	-0.13	1
Parents of Children with Normal Development													
Food enthusiast (Gh)	1												
Emotional Low Eating (Day)	0.74 **	1											
Enjoying the food (GKA)	12.41 **	12.34 **	1										
Passion to drink (King, Souders et al.)	12.47 **	12.42 **	0.05	1									
Enthusiastic of fullness (Th)	-0.22 *	-0.28 *	-0.16	-0.00	1								
Slow Eating (Bohanny et al.)	-0.38 **	-0.	-0.40 **	0.00	12.41 **	1							
Emotional low eating - (Dazy)	-0.02	12.03	-0.17	0.13	12.27 *	12.28 *	1						
Food Selection (Bicer and Alsaffar)	0.08	12.26 *	0.13	0.13	-0.27	12.07	0.12	1					
Emotional Feeding (Db)	12.15	12.09	-0.07	0.08	12.31 **	12.10	12.17	12.07	1				
Assistive Supply (Yb)	0.19	12.26 *	0.05	0.12	-0.04	12.01	-0.07	12.21	12.27	1			
Encouraging Feeding (Cb)	12.03	-0.09	-0.08	-0.04	12.22 *	12.01	-0.12	12.27 *	12.47 **	0.14	1		
Tightly Controlled Feeding (Skb)	0.05	0.05	-0.02	12.03	-0.00	-0.09	0.05	0.00	12.31 **	0.02	12.26 *	1	
Tolerant Controlled Feeding (Tkb)	-0.24 *	-0.24 *	-0.07	12.21	0.13	12.07	-0.22 *	0.19	12.27	12.15	0.00	-0.03	1

** correlation is significant at 0.01 level

* correlation is significant at 0.05 level

In the analysis of the correlation in order to find an answer to the question about the parental feeding style and the eating behaviors of the children, it was found that there was a positive correlation between the emotionally assistive and encouraging feeding behavior of the autistic children's parents and the children's status of being enthusiastic fullness ($r = 0.30, p < .01$; $r = .59, p < .01$; $r = .25, p < .05$); a positive correlation between the assistive feeding and slow eating and selective eating ($r = .35, p = .01$; $r = .41, p < .01$; $r = .28, p < .05$). However, only the relationship between assistive feeding and satiety eagerness appears to be moderate in these relations. Other relations are respectively low.

When the analysis of the correlation of the parents of normal developing children is reviewed, a positive but weak correlation was found between the feeding style of the parents and the eating behaviors of the children in terms of emotionally assistive and encouraging feeding behavior ($r = .31, p < .01$; $r = .22, p < .05$), and it seems that there is a weak relationship between food-enthusiasm and emotional under eating with tolerance-controlled feeding.

Discussion

The reviews in the studies show that a large part of children with autism experience various problems in relation with nutrition and the parents were in need for a supportive guidance in feeding processes (Kral et al., 2015, Kral et al., 2013). While identifying these problems, though not in a sufficient number, children with autism have been taken into consideration only and the answer to the question whether there was any big difference from the children with normal development was not actually looked for (Volkert and Vaz, 2010). Answering this question and identifying the feeding behaviors of the parents of autistic children, compared to those of normal developing children is crucial for developing appropriate educational strategies for parents who of these children (Johnson et al., 2015)

Girli et al (2016) reported in their studies with the parents of the autistic children reported that 37.8% of the mothers faced multiple problems during feeding (Girli et al., 2016). Also Schreck et al (2004) reported that children with autism experienced more problems in relation with nutrition compared to the children without autism (Schreck et al., 2004). In this study, 49% of the parents with autistic children, and 54,9% of the parents of children with normal development have been experiencing problems related to

nutrition. As can be seen, parents of normal-growing children reported to have more problems related with nutrition though in a small proportion. Kerzner et al (2015) explained this case, saying "*the families usually described their kids as undernourished individuals* (Kerzner et al., 2015)

In comparison between the two groups in terms of feeding behaviors of their children and the feeding behaviors of the parents, it was determined that there was a difference only in the sub-category of "encouraging feeding" regarding the feeding behaviors of the parents. When looking at the difference, it can be said that the parents with autistic children exhibit a more encouraging feeding behavior compared to the parents having normally developing children (*see table 2*). This suggests that the parents of children with autism had accepted that potential problems for the nutrition of children might always occur (Wing, 2013). However, such results are findings showing that also the parents of normally developing children need guidance in their feeding process, just like the parents of autistic children.

As depicted in the study, when assessing the nutritional behaviors of the children and their parents according to the socio-demographic characteristics of the children and parents, that the "emotional overeating" was more in the autistic girls compared to the "food enthusiastic" boys. Again, the autistic children with low income have a higher rate of "enthusiasm for toughness" and "slow dietary behaviors". Girli et al. (2016) have not reported any significant difference between the parental feeding styles and socio-demographic characteristics in their study (Girli et al., 2016). The number of studies on parental feeding behaviors is very limited. In this context, Girli et al. (2016) found that the encouraging feeding behavior of the mothers of the autistic children in the 1-6 age group was greater (Girli et al., 2016). Whereas in our study, no difference was found in any sub-categories between the eating behaviors of children and the feeding behaviors of the parents according to their ages.

Conclusion

The conclusions of this study provide information not only for the health professionals but also parents and teachers about feeding process. At the beginning of this study, it was presumed that the nutrition of the autistic

children and the feeding style of their parents were different from those of the children with normal development in the sample of our country. However, while the results show that children with autism and their parents have problems during this process, the parents of the normal developing children have problems with the feeding process as well and when comparing them with the parents of autistic children, they did not answer much differently. This study showed that Under the scope of primary care and health professionals and nurses working at schools, should not ignore that particularly those with special needs, all parents may have problems at this point and that they should provide effective counseling in all settings and schools where they offer health care.

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