

Research Article

Analysis of the Nutrition, Self-Care Skills, and Health Professional Support in Schools of Children with Autism Spectrum Disorder

Esma Kabasakal¹ , Funda Özpulat² , Elif Bakır³ ¹Department of Public Health Nursing, Ankara Yıldırım Beyazıt University, Ankara, Turkey²Department of Public Health Nursing, Selçuk University, Konya, Turkey³Department of Pediatric Nursing, Hacettepe University, Ankara, Turkey

ORCID iDs of the authors: E.K. 0000-0001-9305-4363, F.Ö. 0000-0002-1789-6216, E.B. 0000-0002-6032-2867.

Cite this article as: Kabasakal, E., Özpulat, F., & Bakır, E. (2021). Analysis of nutrition, self-care skills, and health professional support at schools in children with autism spectrum disorder. *Florence Nightingale J Nurs*, 29(2), 239-249.

Abstract

AIM: This study aimed to determine the nutrition, self-care skills, and health professional support of children with autism spectrum disorder.**METHOD:** This is a descriptive and cross-sectional study. The parents of 82 children with autism spectrum disorder agreed to participate as part of a study group in 8 special education schools in 3 districts. The schools were selected on the basis of their levels of sociodemographic development. The data were collected and analysed between September 2016 and July 2017 using a two-section questionnaire developed after a literature review.**RESULTS:** The majority of the parents (63.4%) had sufficient knowledge with regard to autism spectrum disorder, but the issues that were most lacking in terms of education were care, nutrition, and skills related to daily living (36.2%). The parents wanted to be educated on "nutrition problems," and "activities of daily living." The majority of the children lacked self-care skills (82.9%).**CONCLUSION:** The most frequently observed nutrition problem in children with autism spectrum disorder was selective eating. In line with the literature, the majority of the children in this study were found to be unable to care for themselves. School nurses can provide support in terms of nutrition and self-care skills in these schools. School health education programmes for parents can be developed to allow for the more rapid and effective resolution of nutrition and self-care problems.**Keywords:** Autism spectrum disorder, nutrition, school health services, self-care skills

Introduction

Autism spectrum disorder (ASD) is a developmental disability and neurological disorder that occurs in the first 3 years of life, resulting in a lack of communication skills and limited and repetitive behaviours with symptoms relating to a tendency to focus on specific areas of interest (American Psychiatric Association [APA], 2013). The estimated global prevalence of ASD is approximately 1% (Tseng et al., 2018). Although the main deficiency in children with ASD normally concerns social interaction and behavioural issues, the majority of these children experience a higher incidence of nutritional problems than their healthy peers (Sharp et al., 2013), and many parents resort to seeking help from physicians (Mukaddes, 2013). It is stated that nutrition may play a role in the aetiology of ASD and that the treatment of the

disorder may be improved by alleviating symptoms related to this (Berding & Donovan, 2016).

A good nutritional programme is extremely important in terms of physical, cognitive, and behavioural development in children with developmental retardation, owing to the importance of the digestive system and eating problems and elimination diets for therapeutic purposes (Bat, 2012).

Gastrointestinal problems are four times more common in children with ASD than in non-autism control groups (Mcelhanon et al., 2014). Gastrointestinal problems include constipation, diarrhoea, abdominal pain, nausea, vomiting, and reflux (Neuhaus et al., 2018). Children with ASD may have limited food intake of certain substances (intolerance and allergies to foods containing wheat, milk, or gluten) and may have difficulty in

Corresponding author: Esma Kabasakal

E-mail: esm.akf@gmail.com

Date of receipt: June 7, 2019

Date of acceptance: March 26, 2020



This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License

receiving the necessary nutrients (Bandini et al., 2010). Dietary problems, such as nutritional selectivity, feeding with uniform foods, and low nutrient consumption, have been associated with gastrointestinal symptoms as well as nutritional deficiencies (Hsiao, 2013). Another important aspect of nutrition in children with ASD is that mealtimes are the hours when family members interact together. Problems, such as selective eating and food refusal, affect all the family members and make them tense at mealtimes (Bagatell et al., 2014). This situation leads to an increase in the level of stress in the family and the deterioration of the parent-child relationship, which can turn into a chronic problem that needs to be treated (Postorino et al., 2015). The nutritional problems of children with ASD also affect their anthropometric measurements. Parents of children with ASD also complain about their children's irregular and unhealthy nutrition and problems in terms of controlling their children's weight (Karacar, 2016).

In studies conducted in children with ASD aged 2–18 years old, these children had higher body mass index (BMI) values than those of control groups (Kummer et al., 2016); it was reported that the waist, hip, and upper middle arm circumferences were bigger for children in the group of 5–10-year-olds than for those in the control group (Samir & Patil, 2018). In his studies, Dağdır (2018) found that the BMI values of 25% of autistic children were between 25 and 29.9 kg/m², which indicates that they were overweight.

The nutritional problems of children with ASD can reach a level that can affect their growth, development, and quality of life, resulting in the need for support from health professionals. Therefore, it is important that nutrition problems are considered seriously and that a professional provides the children with developmental support and helps to make eating a family interaction tool. In contrast, self-care skills play a significant role in maximising the independence of children with ASD. The acquisition of self-care skills increases the children's capabilities and the families' quality of life. Top (2009) have indicated that as these children get older, caring for them becomes more difficult, their parents' social activities decrease owing to the children's aggressive behaviours. Multidisciplinary treatments are known to be effective for children with ASD who have nutrition problems (Sharp et al., 2013). It is recommended that the team that provides these services includes professionals, such as a special education specialist, child and adolescent mental health specialist, paediatrician, nurse, speech and language therapist, audiologist,

physical therapist, psychologist, social service specialist, dietitian, and family therapist (Christon & Myers, 2015). Nurses should be able to determine the needs of families within the scope of school health services for children with ASD who have nutritional problems.

The literature also recommends that families are encouraged to collaborate with nurses (Mcstay et al., 2014; Özcan et al., 2013; Töret et al., 2014; Weiss et al., 2013), who are key individuals when ensuring coordination with other team members working with children with ASD and their families and when providing family-oriented care with a holistic approach. Family-oriented care leads to an increase in the children's well-being through the participation of their families and professional teams (Kabasakal & Emiroğlu, 2018). This study aimed to determine the children's nutritional problems and self-care needs at school, as well as their families' relationships with health professionals.

Research Questions

1. Do children with ASD experience nutritional problems or need nutritional support at school?
2. Do children with ASD need self-care at school?
3. Do the parents of children with ASD cooperate with occupational and health professionals?

Method

Study Design

This study is a descriptive and cross-sectional study.

Sample

The study population included non-paid special education and application centres belonging to the Ministry of National Education in the Yenimahalle, Çankaya, and Altındağ districts of Ankara. These districts were selected on the basis of their levels of sociodemographic development. Socioeconomic factors are among the determinants of health as they affect access to health resources. Çankaya district is considered to be a developed region with a high literacy population rate, Yenimahalle district is a medium-developed region, and Altındağ is a relatively less developed region than the other districts (Yüceşahin & Tüysüz, 2011). All the special education schools that agreed to participate in the study were included in the study sample.

The 3 districts had a total of 11 government special education schools, and 8 of them agreed to participate in this study. From the schools, the parents of 82 children with ASD agreed to participate the study.

Data Collection

The data were collected and analysed between September 2016 and July 2017 using a two-section questionnaire developed by the researchers after performing a literature review (Bandini et al., 2010; Bat, 2012; Girli et al., 2016; Jensen & Spannagel, 2011).

Data Collection Tools

A – Characteristics of the Child

The first section of the questionnaire included questions on each child's age, gender, specific nutrition programme, selective eating and drinking habits, chewing and swallowing problems, and self-care skills, such as cutting one's nails and dressing oneself.

B – Characteristics of the Family

The second section included questions on the parents' sociodemographic data, whether they had other children with health problems, their information sources regarding ASD, and an assessment of their information about ASD.

Statistical Analysis

Statistical analyses were performed using the Statistical Package for Social Sciences version 23.0 software (SPSS Inc.; Chicago, IL, USA) program. Arithmetic means and standard deviations were calculated; an independent samples t-test, one-way analysis of variance test, and chi-square test were used for the numeric variables. The children's age distribution was assessed using the Shapiro-Wilk normality test.

Ethical Considerations

Ethics approval was provided by the Hacettepe University non-invasive research ethical committee (GO- 15/451-04), and research permission was obtained from the Directorate of National Education foundation (E-4705675). Verbal consent was obtained from the administration of the schools where the research was conducted.

Results

The majority of the children with ASD included in the study were boys (85.4%) and were not able to self-care (82.9%). The majority (78.0%) also ate meals with their families, and nearly half of them (52.4%) were selective about the food they ate. 9.8% of them had reflux and 18.3% had chewing or swallowing problems. 20.7% of them had lack of appetite, 3.7% had diarrhoea, 20.7% had constipation. More than half of the children ate between meals, 39.0% of them drank at least 6 glasses of water per day, and the majority of the parents (75.6%) did not cook specific meals for their children (Table 1).

Table 1
Characteristics of the Children (n = 82)

	Min-max	$\bar{X} \pm SD$
Age (years)	5–25	11.90 ± 4.02
	n	%
Gender		
Girl	12	14.6
Boy	70	85.4
Child has self-care skills		
Yes	14	17.1
No	68	82.9
	Min-max	$\bar{X} \pm SD$
Number of main meals	2–7	3.3 ± 0.9
Number of snacks	1–7	2.4 ± 1.2
Child has food selectivity		
Yes	43	52.4
No	39	47.6
Child has beverage selectivity		
Yes	38	46.3
No	44	53.7
Child eats dinner with the family		
Yes	64	78.0
No	18	22.0
Chewing–swallowing problems		
Yes	15	18.3
No	67	81.7
Reflux problems		
Yes	8	9.8
No	74	90.2
Daily water consumption of the child		
Less than 2 cups	5	6.2
2–3 cups	23	28.0
4–5 cups	22	26.8
6 cups and more	32	39.0
Loss of appetite		
Yes	17	20.7
No	65	79.3
Frequent diarrhoea		
Yes	3	3.7
No	79	96.3
Frequent constipation		
Yes	17	20.7
No	65	79.3
Child eats snacks		
Yes	57	69.5
No	25	30.5
Special cooking for the child		
Yes	20	24.4
No	62	75.6

Note. $\bar{X} \pm SD$: Arithmetic Mean ± Standard Deviation

A statistically significant difference was found between the quantity of water consumed daily and the children's age ($p < .05$); the quantity of water consumed increased as their age increased. In addition, a significant relationship was found between the children's lack of appetite and their age; children under the age of 12 years old were observed to have a greater lack of appetite (Table 2).

Table 2
Comparison of the Children's Ages and Nutritional Characteristics (n = 82)

	$\bar{X} \pm SD$	t	p
Child has food selectivity			
Yes	11.77 ± 3.68	-.317	.752
No	12.05 ± 4.41		
Child has beverage selectivity			
Yes	11.03 ± 3.78	-1.860	.067
No	12.66 ± 4.12		
Child eats dinner with the family			
Yes	11.91 ± 3.91	.016	.987
No	11.89 ± 4.55		
Chewing–swallowing problems			
Yes	9.6 ± 2.92	-2.533	.013*
No	12.42 ± 4.07		
Reflux problems			
Yes	9.60 ± 3.78	-.647	.524
No	10.78 ± 3.69		
Loss of appetite			
Yes	9.23 ± 3.63	-3.246	.002*
No	12.60 ± 3.85		
Frequent diarrhea			
Yes	11.33 ± 3.79	-.248	.805
No	11.92 ± 4.05		
Frequent constipation			
Yes	10.35 ± 3.64	-1.808	.074
No	12.31 ± 4.05		
Child eats snacks			
Yes	11.74 ± 3.68	-.560	.577
No	12.28 ± 4.78		
Special cooking for the child			
Yes	11.60 ± 3.07	-.385	.702
No	12.00 ± 4.30		
Daily water consumption of the child			
	$\bar{X} \pm SD$	F	p
Less than 2 cups	9.60 ± 3.78	3.484	.020*
2–3 cups	10.78 ± 3.69		
4–5 cups	11.18 ± 3.92		
6 cups and more	13.56 ± 3.92		

Note. $\bar{X} \pm SD$: Arithmetic Mean ± Standard Deviation
* $p < .05$

Three-quarters of the parents (75.7%) were mothers, and the majority of the mothers (67.1%) unworked. Most (63.4%) had sufficient knowledge regarding ASD, but the issues that were most lacking in terms of education (36.2%) were care, nutrition, and skills

Table 3
Characteristics of the Parents (n = 82)

	Min–max	$\bar{X} \pm SD$
Age (years)	26–60	39.90 ± 7.99
	n	%
Mother	62	75.6
Father	20	24.4
Education		
Primary school or lower	6	7.4
Secondary school	28	34.1
High school	26	31.7
University or higher	22	26.8
Job		
Officer	14	17.1
Worker	9	11.0
Self-employed	4	4.8
Not working	55	67.1
Health problems in other children		
Yes	5	6.1
No	77	93.9
Presence of children who have mainstream education excluding the autistic children		
Yes	13	15.9
No	69	84.1
Have sufficient knowledge about autism		
Yes	52	63.4
No	30	36.6
Educational needs of the parents*		
Adaptation to school life	12	8.1
Autism: Characteristics and treatment	39	26.2
Self-care, nutrition, and skills training in daily life activities	54	36.2
Disability rights	41	27.5
Other	3	2.0
Assistance from school related to children's education		
Yes	58	70.7
No	24	29.3
Collaboration with professionals (doctor, nurse, psychologist, psychiatrist, teacher)		
Yes	35	42.7
No	47	57.3

Some Features of the Parents (n = 82)
Note. $\bar{X} \pm SD$: Arithmetic Mean ± Standard deviation
*:more than one option ticked.

Table 4
 Comparison of Characteristics According to Parents' Education

	Secondary school and lower		High school and higher		χ^2	<i>p</i>
	<i>n</i>	%	<i>n</i>	%		
Sufficient information about the child's disorder (<i>n</i> = 82)						
Yes	18	52.9	34	70.8	2.746	.011*
No	16	47.1	14	29.2		
Assistance from school related to the child's education (<i>n</i> = 82)						
Yes	23	67.6	35	72.9	.267	.630
No	11	32.4	13	27.1		
Collaboration with professionals (doctor, psychologist, psychiatrist, teacher) (<i>n</i> = 82)						
Yes	12	35.3	23	47.9	1.296	.269
No	22	64.7	25	52.1		
Child has self-care skills (<i>n</i> = 82)						
Yes	7	20.6	7	14.6	.507	.557
No	27	79.4	41	85.4		
Child has special nutrition programme (<i>n</i> = 82)						
Yes	5	14.7	3	6.3	1.616	.266
No	29	85.3	45	93.8		
Child nutrition selectivity (<i>n</i> = 82)						
Yes	14	41.2	29	60.4	2.954	.117
No	20	58.8	19	39.6		
Child beverage selectivity (<i>n</i> = 82)						
Yes	16	47.1	22	45.8	.012	1.000
No	18	52.9	26	54.2		
Child eats with the family (<i>n</i> = 82)						
Yes	24	70.6	40	83.3	1.887	.187
No	10	29.4	8	16.7		
Child eats snacks (<i>n</i> = 82)						
Yes	20	58.8	37	77.1	3.131	.092
No	14	41.2	11	22.9		
Parent makes special meals/diets for the child (<i>n</i> = 82)						
Yes	8	23.5	12	25.0	.023	1.000
No	26	76.5	36	75.0		
Child's nutrition at school (<i>n</i> = 82)						
Sufficient	9	26.5	19	39.6	3.963	.138
Insufficient	11	32.4	7	14.6		
Partially sufficient	14	41.2	22	45.8		
The need for support regarding the child's nutrition at school (<i>n</i> = 81)						
Yes	16	48.5	20	41.7	.368	.650
No	17	51.5	28	58.3		

**p* < .05

Table 5
 Comparison of Characteristics of Parents by Age (n = 82)

	$\bar{X} \pm SD$	t	p
Health problems in other children			
Yes	39.80 ± 6.72	-.029	.977
No	39.91 ± 8.09		
Has sufficient information about the child's disorder			
Yes	39.79 ± 8.22	-.169	.866
No	40.10 ± 7.69		
Assistance from school related to the child's education			
Yes	39.16 ± 8.07	-1.323	.189
No	41.71 ± 7.64		
Collaboration with professionals (doctor, psychologist, psychiatrist, teacher)			
Yes	36.17 ± 5.94	-3.970	.000*
No	42.69 ± 8.23		
Child has self-care skills at home			
Yes	34.86 ± 4.35	-2.694	.009*
No	40.94 ± 8.19		
Child has special nutrition programme			
Yes	36.75 ± 4.33	-1.178	.242
No	40.24 ± 8.23		
Child has food selectivity			
Yes	39.86 ± 7.83	-.050	.961
No	39.95 ± 8.26		
Child has beverage selectivity			
Yes	39.00 ± 6.95	-.950	.345
No	40.68 ± 8.79		
Child eats with the family			
Yes	40.38 ± 7.69	1.011	.315
No	38.22 ± 8.99		
Child eats snacks			
Yes	40.70 ± 8.11	1.376	.173
No	38.08 ± 7.54		
Parent makes special meals/diets for the child			
Yes	40.45 ± 9.42	.351	.727
No	39.73 ± 7.55		
Child's nutrition at school			
Sufficient		1.090	.385
Insufficient			
Partially sufficient			
The need for support regarding the child's nutrition at school			
Yes	41.11 ± 9.15	1.090	.279
No	39.18 ± 6.81		

Note. $\bar{X} \pm SD$: Arithmetic Mean ± Standard deviation
 *p < .05

related to daily living. In the "other" response to the question on the issues on which they wanted to be educated, they included "nutrition problems," "adolescent education," and "activities of daily living." Nearly half of the participants (42.7%) answered "yes" to the question on whether they worked with occupational professionals (Table 3). Furthermore, 34.9% of the participants received support/help from their children's classroom teachers, 21.8% from the schools' special education teachers, 19.9% from the special education schools their children attended, 14.7% from school counselling services, and 10.3% from counselling and research centres. Moreover, 52.9% of the parents who had secondary education or lower stated that they had sufficient information about the diagnosis of their children; the ratio of sufficient information increases to 70.8% in parents with high school education or higher, but no statistically significant relationship was observed ($p > .05$) (Table 4).

Approximately half (47.9%) of the parents with high school education or higher cooperated with a professional in matters related to their children. This rate decreases to 35.3% in parents with secondary education or lower, but no statistically significant difference was identified ($p > .05$). In addition, 14.7% of the parents who had secondary education or lower and 6.3% of the parents who had high school education or higher had special nutrition programmes for their children. Moreover, 83.3% of parents with high school education or higher stated that their children ate a meal with the family, and 77.1% of them affirmed that their children had a snack. In both cases, the percentage of parents with high school education or higher was higher, but there were no significant differences ($p > .05$). Parents generally thought the need for support regarding the child's nutrition at school, and 48.5% of the parents with secondary education or lower and 41.7% of the parents with high school education or higher agreed with this statement (Table 4).

Regarding their children's nutrition during school hours, 43.9%, 34.1%, and 22.0% of the parents found it to be partially sufficient, sufficient, and insufficient, respectively.

The degree to which parents collaborate with occupational professionals on matters related to their children varied depending on the parents' age

($p < .05$), and as their age increased, the amount of collaboration with professionals decreased. In this study, the children's self-care skills varied according to the age of their parents, and as the age of their parents increased, the children's ability to perform self-care skills decreased ($p < .05$) (Table 5).

Discussion

In this study, conducted to determine the nutritional problems of children with ASD, their self-care needs, and the cooperation of families with health professionals, 36.6% of the parents stated that they did not have sufficient information about autism. In other words, the parents of 1 in every 3 children diagnosed with ASD find that their knowledge regarding the diagnosis of their children is insufficient (Table 3). With regard to the elements that require education, the aspects that were found to be most lacking in terms of training were identified as being self-care, nutrition, and daily living activities (Table 3).

In line with the literature, the majority of the children in this study were found to be unable to care for themselves (Gorlin et al., 2016; Kim et al., 2016; Selimoğlu et al., 2013; Top, 2009). Providing children with ASD with self-care skills increases such children's capacities and increases the quality of life of the children and their families. Top (2009) found that it was difficult to care for children with ASD as they grew up, that their parents' social activities decreased owing to their children's aggressive behaviour. Similarly, in this study, the ability of the children to acquire self-care skills varied according to the age of the parents and was observed to decrease as the age of the parents increased (Table 5). This finding suggests that as parents get older, it becomes more difficult for their children with ASD to obtain self-care abilities. It is important to promote self-care skills in these children.

Professionals undertaking the children's treatment and care, and particularly the families of these children, have important duties in terms of helping the children acquire self-care skills, such as those related to nutrition, dressing and undressing themselves, personal hygiene, and going to the toilet. Helping the children acquire nutrition skills is extremely important in terms of them being able to feed themselves, gaining independence and respect in society, and having increased opportunities to be included in social life (Akarsu, 2014).

In this study, constipation, anorexia, and chewing and swallowing problems were found in 20.7%, 20.7%, and 18.3% of the children with ASD, respectively. Alp (2018) reported that the most common symptoms in children with autism were diarrhoea (64.3%), gas complaints (57.1%), abdominal pain (50.0%), and constipation (35.7%). Gastrointestinal disorders, such as functional constipation, diarrhoea, and gastroesophageal reflux, seen in ASD were reported to be related to problematic behaviours, such as nutrient selection, which children with autism often develop (Margolis et al., 2019). In fact, the particularity of nutrient selection, which is a factor in digestive system disorders in children with ASD, was determined as the most common feeding problem in children in this study (52.4%) (Table 1). Similarly, the literature also shows that the most significant nutritional problem observed in children is selective eating (Bandini et al., 2010; Bat, 2012; Emond et al., 2010; Field et al., 2003; Girli et al., 2016; Herndon et al., 2009; Kerwin et al., 2005; Lukens & Linscheid, 2008; Valicenti-McDermott et al., 2006; Vissoker et al., 2015; Zimmer et al., 2012). One of the most important factors in adequate and balanced nutrition is the attention to food variety. An adequate and balanced dietary intake of polyunsaturated fatty acids, antioxidants, vitamins, and minerals increases cognitive function (Demircioğlu & Yabancı, 2003). Special diets and dietary supplements may be effective in reducing the gastrointestinal symptoms of autism (Campion et al., 2018). Moreover, in this study, 24.4% of the parents made special meals/diets for their children (Table 1).

The most important feature of children with autism is their adherence to routines and rituals. The children's reactions to changes manifest themselves in nutrition as well. This situation causes the children to refuse to eat different foods and disrupts the growth and development process (Esteban-Figuerola et al., 2019). In this study, approximately one-quarter of the parents (22%) found that the food their children receive at school is inadequate. Bandini et al. (2017), in a study of 18 children with ASD, stated that children's refusal of food declined over the years. It is noted that progression toward healthy nutrition in these children is achieved through early interventionist approaches. Accordingly, it is important that the children and their families are supported by intervention studies to ensure that the children are introduced to healthy foods and achieve diversity in terms of their nutrition. In this process, the needs of families should not be ignored. In the study by Alp

(2018), positive development was achieved with nutrition education given to families with autistic children. In this study, it can be seen that parents need education regarding the diagnosis, nutrition, and self-care skills of their children (Table 3). It was found that more than half of the parents did not cooperate with professionals (Table 3). The degree to which the parents have sufficient information about their children's diagnosis and cooperate with health-care professionals differs according to the level of education and on whether they receive assistance from the schools.

Collaboration with healthcare professionals regarding child-related issues is stronger for parents with high school education or higher. These findings suggest that the socioeconomic characteristics of parents should be taken into consideration by health professionals. Again, as the age of the parent increases, the rate of cooperation with health professionals decreases (Table 5). As the life experiences of parents increase, the need for health resources may decrease. It is known that the cooperation of parents of children with special needs with professionals provides more information about the diagnosis, needs, and development of the children and facilitates their school lives (Humphrey et al., 2006).

In terms of the cooperation of health professionals with the parents of children with special needs, previous research has focused on the poor coordination between health services, hospital staff, and community services, as well as between health and education staff (Franks et al., 2015; Kolbe et al., 2015; Shimizu & Katsuda, 2015). Health professionals are quite important in terms of the education, counselling, and awareness activities intended for these children's families and in the follow-up of the growth and development process starting from each child's diagnosis. Health professionals can provide rapid and effective solutions to improve the quality of lives of families by regularly following up on the growth and development of these children, providing them with information about proper nutrition behaviours, and increasing self-care skills in relation to their daily living activities.

The success of education systems is possible with the implementation of teamwork involving physicians, nurses, dietitians, teachers, school administrators, parents, social care specialists, psychologists, and psychological counselling and guidance

specialists. In this study, 42.7% of the parents stated that they were cooperating with a professional. Furthermore, three people stated that they were in cooperation with family health personnel, two people stated that they were in collaboration with psychologists, one person stated that he/she was in cooperation with psychiatrists, and none of them got support from nurses (Table 3). The role of nurses in universal school health services is important (Kabasakal, 2019). Nurses provide care, communication, and coordination in schools regarding children's health statuses (Kruger et al., 2009; Maughan & Adams, 2011). The Turkish Nursing Regulations (2011) stipulate that school health nurses have roles and responsibilities as caregivers, supervisors, educators, and counsellors. Public health nurses, particularly those who work in schools, should be able to actively implement education, counselling, and support services in the form of self-care, health screening, parental education, and school staff and parental guidance, improving the quality of life of the children and providing healthy nutritional support.

Conclusion and Recommendations

According to the results of this research, parents need information about their children's diagnosis. Parents need training in terms of providing their children with self-care and daily living activity skills. Parents should cooperate with health professionals during their children's growth and development. In particular, public health nurses should be more active in fulfilling their training and counselling roles. The professional personnel responsible for providing access to health resources for these children in schools are school health nurses, who constitute a sub-branch of public health.

In future studies, pilot schools could be selected randomly from primary education schools to determine the roles of health professionals in the management of the nutrition and self-care problems of children with ASD. School nurses can provide support in terms of nutrition and self-care skills in these schools. In addition, education programmes can be developed for the parents of children with ASD to allow for the more rapid and effective resolution of nutrition and self-care problems. The effectiveness of the support provided by health professionals can be analysed by comparing the findings of such a study conducted in pilot schools with the findings of this study.

Ethics Committee Approval: This study was approved by Ethics committee of Hacettepe University (Approval No: GO15/451-04).

Informed Consent: Written informed consent was obtained from the parents who agreed to take part in the study.

Peer-review: Externally peer-reviewed.

Author Contributions: Supervision – E.K., F.O., E.B.; Design – E.K., F.O.; Resources – E.K., F.O., E.B.; Materials – E.K., F.O., E.B.; Data Collection and/or Processing – E.K.; Analysis and/or Interpretation – F.O.; Literature Search – E.K., F.O., E.B.; Writing Manuscript – E.K., F.O., E.B.; Critical Review – E.K., F.O., E.B.

Conflict of Interest: The authors have no conflict of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

References

- Akarsu, Ö. (2018). *Zihinsel yetersiz çocukların aile yükü, özbakım becerileri, annelerinin yaşam doyumu ve etkileyen faktörler* [Family burden, selfcare skills of children with mental deficiency, their mothers' satisfaction for life and affecting factors]. [Master's Thesis, Trakya University]. Council of Higher Education Thesis Center.
- Alp, A. G. (2018). *Otistik bozukluğu olan çocukların beslenme durumlarının tanımlanması ve ailelere verilen beslenme eğitiminin etkisinin belirlenmesi* [Determination of nutritional status of autistic children and effect of nutrition education of families]. [Master's Thesis, Hasan Kalyoncu University]. Council of Higher Education Thesis Center.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (DSM-5)*. American Psychiatric Association Publishing. [\[Crossref\]](#)
- Kummer, A., Barbosa, I. G., Rodrigues, D. H., Rocha, N. P., da Silva Rafael, M., Pfeilsticker, L., e Silva, A. C. S., & Teixeira, A. L. (2016). Frequency of overweight and obesity in children and adolescents with autism and attention deficit/hyperactivity disorder. *Revista Paulista de Pediatria (English Edition)*, 34(1), 71-77. [\[Crossref\]](#)
- Bagatell, N. J., Cram, M., Alvarez, C. G., & Loehle, L. (2014). Routines of families with adolescents with autistic disorders: A comparison study. *Canadian Journal of Occupational Therapy*, 81(1), 62-67. [\[Crossref\]](#)
- Bandini, L., Curtin, C., Phillips, S., Anderson, S. E., Maslin, M., & Must, A. (2017). Changes in food selectivity in children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 47(2), 439-446. [\[Crossref\]](#)
- Bandini, L. G., Anderson, S. E., Curtin, C., Cermak, S., Evans, E. W., Scampini, R., Maslin, M., & Must, A. (2010). Food selectivity in children with autism spectrum disorders and typically developing children. *The Journal of Pediatrics*, 157(2), 259-264. [\[Crossref\]](#)
- Bat, Z. (2012). *6-15 yaş arasındaki otizm spektrum bozukluğu olan çocukların beslenme durumunun değerlendirilmesi*

[Assessment of the nutritional status of children age of 6-15 with autism spectrum disorder]. [Master's Thesis, Haliç University]. Council of Higher Education Thesis Center.

Berding, K., & Donovan, S. M. (2016). Microbiome and nutrition in autism spectrum disorder: Current knowledge and research needs. *Nutrition Reviews*, 74(12), 723-736. [Crossref]

Campion, D., Ponzo, P., Alessandria, C., Saracco, G. M., & Balzola, F. (2018). The role of microbiota in the autism spectrum disorders. *Minerva Gastroenterologica e Dietologica*, 64(4), 333-50. [Crossref]

Christon, L. M., & Myers, B. J. (2015). Family-centered care practices in a multidisciplinary sample of pediatric professionals providing autism spectrum disorder services in the United States. *Research in Autism Spectrum Disorder*, 20, 47-57. [Crossref]

Dağdır Gök H. (2018). *Serebral palsi ve otizmlı çocuklarda beslenme alışkanlıklarının gösterilmesi ve biyokimyasal yaklaşımlarla değerlendirilmesi*. [Signation of dietary habits in children with autism and cerebral palsy and its evaluation with biochemical approaches]. [Master's Thesis, Gazi University]. Council of Higher Education Thesis Center.

Demircioğlu, Y., & Yabancı, N. (2003). Beslenmenin bilişsel gelişim ve fonksiyonları ile ilişkisi [The relationship of nutrition and cognitive development and its functions]. *Hacettepe University Journal of Education*, 24, 170-179.

Emond, A., Emmett, P., Steer, C., & Golding, J. (2010). Feeding symptoms, dietary patterns, and growth in young children with autism spectrum disorders. *Pediatrics*, 126(2), e337-e342. [Crossref]

Esteban-Figuerola, P., Canals, J., Fernández-Cao, J. C., Arijal Val, V. (2019). Differences in food consumption and nutritional intake between children with autism spectrum disorders and typically developing children: A meta-analysis. *Autism*, 23(5), 1079-1095. [Crossref]

Field, D., Garland, M., & Williams, K. (2003). Correlates of specific childhood feeding problems. *Journal of Pediatrics and Child Health*, 39, 299-304. [Crossref]

Franks, A., Kelder, S., Dino, G. A., Horn, K. A., Gortmaker, S. L., Wiecha, J. L., & Simoes, E. J. (2007). School-based programs: lessons learned from CATCH, planet health, and not-on-to-bacco in School nutrition and activity: Impacts on well-being. *Preventing Chronic Disease*, 4(2), 147-163.

Girli, A., Özgönel, S. Ö., Sarı, H. Y., & Ardahan, E. (2016). Otizmi olan çocukların beslenme durumunun değerlendirilmesi [Assessment of nutrition of children with autism]. *Çocuk ve Medeniyet Dergisi*, 1(1).

Gorlin, J. B., McAlpine, C. P., Garwick, A., & Wieling, E. (2016). Severe childhood autism: The family lived experience. *Journal of Pediatric Nursing*, 31(6), 580-597. [Crossref]

Hemşirelik Yönetmeliği [Nursing Regulation] (2011). Retrieved from: <https://www.saglik.gov.tr/TR,10533/hemsirelik-yonetmeliği.html>

Herndon, A. C., Di Guiseppi, C., Johnson, S. L., Leiferman, J., & Reynolds, A. (2009). Does nutritional intake differ between children with autism spectrum disorders and children with typical development? *Journal of Autism and Developmental Disorders*, 39(2), 212. [Crossref]

Hsiao, E. Y. (2013). Immune dysregulation in autism spectrum disorder. *International Review of Neurobiology*, 113, 269-302. [Crossref]

Humphrey, N., Bartolo, P., Ale, P., Calleja, C., Hofsaess, T., Janikova, V., Lous, A. M., Vilkiene, V., & Wetso, G. M. (2006). Understanding and responding to diversity in the primary classroom: An international study. *European Journal of Teacher Education*, 29(3), 305-318. [Crossref]

Jensen, V. K., & Spannagel, S. C. (2011). The spectrum of autism spectrum disorder: A spectrum of needs, services, and challenges. *Journal of Contemporary Psychotherapy*, 41, 1-9. [Crossref]

Kabasakal, E. (2019). Her okula bir hemşire: Kaynaştırma öğrencileri ve sağlık gereksinimleri [A nurse for each school: Students with disabilities and their health requirements]. *Journal of Contemporary Medicine*, 9(2), 191-195. [Crossref]

Kabasakal, E., & Emiroğlu, O. N. (2017). Okul sağlığı hemşireliğinde öğrenci ve aile odaklı bakım [Student and family centered care at school health nursing]. *Türkiye Klinikleri Public Health Nursing-Special Topics*, 3(2), 88-95.

Karacar E. (2016). *Ebeveynlerin bakış açısından otizmlı çocukların fiziksel aktiviteye katılmalarını etkileyen faktörlerin incelenmesi*. [Investigation of factors on physical activity participation of children with autism from perspective of parents]. [Master's Thesis, Gedik University]. Council of Higher Education Thesis Center.

Kerwin, M. E., Eicher, P. S., & Gelsing, J. (2005). Parental Report of Eating Problems and Gastrointestinal Symptoms in Children with Pervasive Developmental Disorders. *Children's Health Care*, 34(3), 217-231. [Crossref]

Kim, I., Ekas, N. V., & Hock, R. (2016). Associations between child behavior problems, family management, and depressive symptoms for mothers of children with autism spectrum disorder. *Research in Autism Spectrum Disorders*, 26, 80-90. [Crossref]

Kolbe, L. J., Allensworth, D. D., Potts-Datema, W., & White, D. R. (2015). What have we learned from collaborative partnerships to concomitantly improve both education and health? *Journal of School Health*, 85(11), 766-774. [Crossref]

Kruger, B. J., Radjenovic, D., Toker, K. H. & Comeaux, J. M. (2009). School nurses who only care for children with special needs: Working in a teacher's world. *The Journal of School Nursing*, 25, 436-444. [Crossref]

Lukens, C. T., & Linscheid, T. R. (2008). Development and validation of an inventory to assess mealtime behavior problems in children with autism. *Journal of Autism and Developmental Disorders*, 38(2), 342-352. [Crossref]

Margolis, K. G., Buie, T. M., Turner, J. B., Silberman, A. E., Feldman, J. F., Murray, K. F., McSwiggan-Hardin, M., Levy, J., Bauman, M. L., Veenstra-Vander Weele, J., Whitaker, A. H., & Winter, H. S. (2019). Development of a brief parent-report screen for common gastrointestinal disorders in autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 49(1), 349-362. [Crossref]

Maughan, E. & Adams, R. (2011). Educators' and parents' perception of what school nurses do: The influence of school nurse/student ratios. *The Journal of School Nursing*, 27(5), 355-363. [Crossref]

Mcelhanon, B. O., Mccracken, C., Karpen, S., & Sharp, W. G. (2014). Gastrointestinal symptoms in autism spectrum disorder: A meta-analysis. *Pediatrics*, 133(5), 872-83. [Crossref]

Mcstay, R. L., Trembath, D., & Dissanayake, C. (2014). Maternal stress and family quality of life in response to raising a child with autism: From preschool to adolescence. *Research in Developmental Disabilities, 35*(11), 3119-3130. [\[Crossref\]](#)

Mukaddes, M. N. (2013). *Otizm spektrum bozuklukları tanı ve takip*. Nobel Tıp Kitabevleri.

Neuhaus, E., Bernier, R. A., Tham, S. W., Sara, J. (2018) Gastrointestinal and psychiatric symptoms among children and adolescents with autism spectrum disorder. *Front Psychiatry, 22*, 515. [\[Crossref\]](#)

Özcan, C., Kılınç, S., & Gülmez, H. (2013). Türkiye'de okul sağlığı ve yasal durum [School health and legal status in Turkey]. *Ankara Medical Journal, 13*(2), 71-81.

Postorino, V., Sanges, V., Giovagnoli, G., Fatta, L. M., De Peppo, L., Armando, M., Vicari, S., Luigi, M. (2015). Clinical differences in children with autism spectrum disorder with and without food selectivity. *Appetite, 92*, 126-132. [\[Crossref\]](#)

Samir, M., Patil, R. (2018), Nutritional status of autistic and typically developing children in Mumbai. *International Journal of Current Research, 10*(06), 70402-70406.

Selimoğlu, Ö. G., Özdemir, S., Töret, G., Özkuba, U. (2013). Otizmlı çocuğa sahip ebeveynlerin otizm tanılama sürecinde ve tanı sonrasında yaşadıkları deneyimlerine ilişkin görüşlerinin incelenmesi. [An examination of the views of parents of children with autism about their experiences at the post-diagnosis period of autism]. *International Journal of Early Childhood Special Education, 5*(2), 129-167.

Sharp, W. G., Berry, R. C., Mccracken, C., Nuhu, N. N., Marvel, E., Saulnier, C. A., Klin, A., Jones, W., Jaquess, D. L. (2013). Feeding problems and nutrient intake in children with autism spectrum disorders: A meta-analysis and comprehensive review of the literature. *Journal of Autism and Developmental Disorders, 43*(9), 2159-2173. [\[Crossref\]](#)

Shimizu, F., & Katsuda, H. (2015). Teachers' perceptions of the role of nurses: Caring for children who are technology-dependent in mainstream schools. *Japan Journal of Nursing Science, 12*(1), 35-43. [\[Crossref\]](#)

Top, F. Ü. (2009). Otistik çocuğa sahip ailelerin yaşadıkları sorunlar ile ruhsal durumlarının değerlendirilmesi: Niteliksel araştırma. [The evaluation of the problems and psychological

states of the families who have autistic children: a qualitative research]. *Çocuk Dergisi, 9*(1), 34-42.

Töret, G., Özdemir, S., Selimoğlu, Ö. G., & Özkubat, U. (2014). Otizmlı çocuğa sahip olan ebeveynlerin görüşleri: Otizm tanımlamaları ve otizmin nedenleri. [Opinions of parents who have children with autism: Autism definitions and causes of autism]. *Ankara University Faculty of Educational Sciences Journal of Special Education, 15*(01), 001-014.

Tseng, P., Cheng, Y., Chen, Y., Stubbs, B., Whiteley, P., Carvalho, A. F., Li, D., Chen, T., Yang, W., Tang, C., Chu, C., Yang, W., Liang, H., Wu, C., Yen, C., & Lin, P. (2018). Peripheral iron levels in children with autism spectrum disorders vs controls: A systematic review and meta-analysis. *Nutrition Research, 50*, 44-52. [\[Crossref\]](#)

Valicenti-Mcdermott, M., Mccicar, K., Rapin, I., Wershil, B. K., Cohen, H., & Shinnar, S. (2006). Frequency of gastrointestinal symptoms in children with autistic spectrum disorders and association with family history of autoimmune disease. *Journal of Developmental and Behavioral Pediatrics, 27*(2 Suppl.), S128-S136. [\[Crossref\]](#)

Vissoker, R. E, Latzer, Y. Gala, E. (2015). Eating and feeding problems and gastrointestinal dysfunction in autism spectrum disorders. *Research in Autism Spectrum Disorders, 12*, 10-21. [\[Crossref\]](#)

Weiss, J. A., Robinson, S., Fung, S., Tint, A., Chalmers, P., & Lunsy, Y. (2013). Family hardiness, social support, and self-efficacy in mothers of individuals with autism spectrum disorders. *Research in Autism Spectrum Disorders, 7*(11), 1310-1317. [\[Crossref\]](#)

Yüceşahin, M. M., & Tüysüz, S. (2011). Ankara kentinde sosyo-mekânsal farklılaşmanın örüntüleri: Ampirik bir analiz. [Patterns of urban socio-spatial differentiation in Ankara: An empirical analysis]. *Turkish Journal of Geographical Sciences, 9*(2), 159-188. [\[Crossref\]](#)

Zimmer, M. H., Hart, L. C., Manning-Courtney, P., Murray, D. S., Bing, N. M., Summer, S. (2012). Food variety as a predictor of nutritional status among children with autism. *Journal of Autism and Developmental Disorders, 42*(4), 549-556. [\[Crossref\]](#)