International Journal of Home Science 2022; 8(2): 163-166

International Journal of Home Science

ISSN: 2395-7476
IJHS 2022; 8(2): 163-166

www.homesciencejournal.com
Received: 04-07-2022
Accepted: 07-08-2022

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Knowledge and nutrition awareness of parents of Autistic children in selected centers "Khartoum State"

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DOI: https://doi.org/10.22271/23957476.2022.v8.i3c.1368

Abstract
The aim of the study was to identify parent's knowledge about autism, dietary pattern and health problems of autistic. Across-sectional descriptive study was conducted among 50 parents in selected centers in Khartoum State. Result indicated that parent's knowledge about autistic children characteristics was (67.3%). The score knowledge of parents about nutrition need, health problems for these children were (63%) and (50.8%) respectively. The overall score knowledge and nutrition awareness of parents of autistic children was (60.4%), which indicate moderate adequate knowledge. Recommendation from the study suggested that; availability of nutritionist in the autistic centers is highly recommended, regular nutrition assessment of children is essential, and mothers must give more attention to their children dietary habits.

Keywords: Autism spectrum disorder, parent's knowledge, dietary pattern, Khartoum

1. Introduction
Autism Spectrum Disorder (ASD) is neurodevelopmental disorder. The word autism comes from two Greek words "aut" which mean "Self" and "ism" mean "State" [1] and is used to define person who usually absorbed in him. This neuro developmental disorder appears before age of 3 years [2].

It is well known the prevalence of ASD was documented to affect 1 in 68 according to estimate from United States centers for disease control and prevention. This prevalence has increased by 15% to 1 in 59 children [3]. Boys are 4 times more likely to have autism than girls [4].

Factors that cause autism are not fully known. However, environmental factor including autistic factors, mutation, vaccine and maternal (smoking, gestational age, and immune activation) are thought to cause autism [5].

Autism's spectrum disorder symptoms characterized by three main areas of difficulty which include; the presence of qualitative impaired social interaction, impaired communication skill, and restricted, repetitive, stereotypical interest and behavior [6-9]. These three domains, which all people with autism share, are sometimes known as the triad of impairments [10, 11].

Children with autism may experience various behavioral problems, including aggression, self-harm and severe temper tantrums [12]. These types of behavior can affect eating habits. Picky eating habits are one of the most common complaints from parents of children with autism. Challenges can range from limited diet where children only eat from a few food groups, overeating or not eating enough. Sensory issued a round food such as texture and color [13].

Parents usually have the major obligation of caring of their children, which includes management of problematic behavior. Parents of children with autism experience more stress and more susceptible to negative outcome than parents of children with other disabilities [14].

1.1. Justification
With increased incidence of ASDs in pediatric population. Knowledge about autism, and nutrition requirement of autistic children is very crucial.

1.2. Objectives of the study
1.2.1. General objective
To investigate knowledge and nutrition awareness of parents of autistic children in selected centers "Khartoum State".

1.2.2. Specific objectives
- To identify parent's knowledge about autism.
- To assess parent's knowledge about dietary pattern for autistics children.

2. Subjects and Methods
2.1. Study design
This is across-sectional descriptive non experimental study.

2.2. Study period
The study was conducted in the period from 1st of April to 30th of June 2018.

2.3. Study Area
The study was carried out in selected centers in Khartoum State for autism which include; Elshareef Integrated Center, Alblsam center, Alekleel Center and Al hayat Center.

2.4. Study population
Parents of autistic children who attended autistic centers during the study period.

2.5. Sample Size
Total coverage of parents, which comprised of 100 parents.

2.6. Data collection tools
Specially designed questionnaire to collect data about demographic, and socio-economic information, as well as thirty questions were given. Each question was given 4 options, each with one correct answer.

2.7. Statistical Analysis
Statistical analysis was done by using Statistic Package for Social Sciences (SPSS) version.
Scoring interpretation was obtained by using Abirami method [15] with modification as follow:

Scoring interpretation

Level of Knowledge	Score	Percentage%
In adequate knowledge	1-11	1-33
Moderate adequate knowledge	12-21	34-67
Adequate knowledge	13-33	68-80

2.8. Ethical Consideration
- Approval acceptance from the centers were obtained.
- Written and verbal consent was obtained from parents.

Results and Discussion
General characteristics of autistic's children parents shown in table (1). A total number of parents 100. Forty eight percent of mothers age between 31-40 years old, while majority of fathers 30 (60%) age between 41-50 years old. Seventy percent of parents have university education. Regarding occupation of parents, more than half 28 (56%) of mothers were housewives, while majority 49 (98%) of fathers were employed. Twenty eight (56%) of the families with middle class income.

Table 1: Frequency and percentage distribution of demographic variable of autistics' parents

Demographic variable	Parents			
	Female		Male	
	No.	(%)	No.	(%)
Age/year				
>30	5	10	-	-
31 – 40	24	48	2	4
41 – 50	21	42	30	60
51 – 60	-	-	16	32
>60			2	4
Education Level				
Illiterate	0	0	1	2
Primary	2	4	2	4
Secondary	13	26	12	24
University	35	70	35	70
Occupation				
Unemployed	28	56	1	2
Employee	22	44	49	98
Income of the Family	No.		%	
	-		-	
Middle income	28		56	
Middle income	22		44	

Table 2. Shows knowledge of parents about autistic children characteristics. Majority of parents 45 (90%) believed that boys are more susceptible to autism. This agrees with the result reported earlier [4, 16].
Ninety eight percent (49) of parents knew that autistic child has communication difficulties, this agree with previous results that autistic children have faring degree of communication interaction" [17].
Majority of parents 49 (98%) knew that autistic has no early onset of babbling. This agree with the findings that canonical babbling appears promising as potential maker for early detection of infants at risk for development disorder, such as ASD [18, 19]. Regarding facial expression of ASD child, only 7 (14%) of parents showed that autistic child was difficulty in facial expression. In contrast previous studied indicated that there is no interaction in processing facial identify and emotional expression in autism spectrum disorder, and they have trouble making facial expression [20, 21].
Only 11 (22%) of parents knew that stereotype movement can be one of autism characteristic, this disagrees with previous studies [22, 23].
Parents knowledge about the following autistic child characteristics; less response to his/her name, and lack of attention to social stimuli extreme alone, and never laughs with people, parents correct answers were; 34 (68%), 42 (84%), and 44 (88%) respectively. This agree with previous studies that indicated ASD is lifelong developmental disability characterized by qualitative impairment in social and communication interaction [2, 4, 7, 11].
Thirty-two (64%) of parents indicated that autistic child has no perception to danger, this agrees with previous studies that ASD children have many experiences various behavioral problems such as self-harm [11, 12].
The mean percent correct score for parents knowledge about ASD children was (67.3%).

Table 2: Knowledge of parents about autistic children characteristics'

Characteristics	Correct answer			
	No.	(%)	No.	(%)
Gender are more susceptible to autism				
Girls	5	10	-	-
Boys	45	90	45	90
Autistics child had communication difficulties				
Yes	49	98	49	98
No	1	2	-	-
Autistics child had early onset of babbling				
Yes	1	2	-	-
No	49	98	49	98
Autistics child had difficulty in understanding facial expression				
Yes	7	14	7	14
No	43	86	-	-
Autistic child shows stereotype movements				
Yes	11	22	11	22
No	39	78	-	-
Autistic child shows less response to his own name				
Yes	34	68	34	68
No	16	32	-	-
Autistics child gains attention to social stimuli				
Yes	8	16	-	-
No	42	84	42	84
Autistic child has no idea of hazard or danger				
Yes	18	36	18	36
No	32	64	-	-
Mean score knowledge				67.3

Table 3. Shows parent's nutrition awareness about nutrition needs for autistics child. Regarding energy requirements of ASD child, about half of parents 24 (48%) have the correct answer, 44 (88%) of parents know what is gluten, and 27 (54%) of them believed that ASD child should eat gluten – free diet, although, there is limited evidence in support of this diet.

Regarding knowledge about camel milk 16 (32%) of parents recommended this milk for ASD. Previous findings suggested that camel milk could play an important role in decreasing oxidative stress by alteration of antioxidant enzymes and non-enzymatic molecule level as well as improvement of autistic behavior [25, 26].

Table 3: Parents' awareness about nutrition needs for autistic children: Nutrition awareness of parents

Parameter	Correct answer			
	No.	(%)	No.	(%)
Energy requirements of autistic child is the same as preschool				
Yes	24	48	24	48
No	26	52	-	-
Gluten is a fat substance				
Yes	6	12	-	-
No	44	88	44	88
Autistic should eat a gluten - free diet				
Yes	23	46	-	-
No	27	54	27	54
Millet should be avoided in autistic diet				
Yes	4	8	-	-
No	46	92	46	92
Casein is a protein found in milk				
Yes	32	64	32	64
No	18	36	-	-
Camel milk is recommended for autistic individual				
Yes	16	32	16	32
No	34	68	-	-
Mean score knowledge				63

The score knowledge of parent's awareness about nutrition needs for ASD child was (63%) which can be described as moderate adequate knowledge. Similar level of knowledge was reported among parents attending SRM general hospital [15].

Table 4. Shows parent's knowledge about health problems and nutrition counseling for ASD child, 19 (38%) of parents knew that vitamin A deficiency is common among autistic children and 22 (44%) of them stated that pumpkin is an excellent source of vitamin A. Previous study reported that vitamin A improves the symptoms of ASD [27].

Twenty one (42%) of parents believe that the result of severe food selection is poor nutrition, and 36 (72%) of them agreed that early nutrition counseling is important for nutrition status. As it reported earlier that exacerbate nutritional deficiency with autism is sensory processing disorder that the child adverse reaction to certain smells, taste and texture result in a limited diet and deficiency in many vitamins and minerals[28].

Twenty nine (58%) of parents believe that expert dietitian improve dietary counseling.

The score for parent's knowledge about health problems and nutrition counseling for ASD children. Was (50.8%) which is moderate adequate? Similar finding was reported in Kattanklathur [15], Medium score of knowledge was reported in Jordon [29], while respondents level knowledge about ASD was week in Saudi Arabia [30]. Similar findings were reported in Ghana [31], Pakistan [32], and Egypt [33] where lack of parents knowledge and aware new regarding children ASD.

Table 4: Parent's knowledge about Health Problems and Nutrition Counseling for autistics children

Parameter	Correct answer			
	No.	(%)	No.	(%)
Vitamin A deficiency is common among autistic children				
Yes	19	38	19	38
No	31	62	-	-
Pumpkin is an excellent source of VIT. A				
Yes	22	44	22	44
No	28	56	-	-
The result of severe food selection in poor nutrition				
Yes	21	42	21	42
No	29	58	-	-
Early nutrition counseling is important for nutrition status				
Yes	36	72	36	72
No	14	28	-	-
Expert dietitian will provide trustful dietary counseling				
Yes	29	58	29	58
No	21	42	-	-
Mean score knowledge				(50.8)

Concussion and Recommendation

The study aimed to assess knowledge and nutritional awareness of parents about autistic children in selected centers in Khartoum state.

The mean knowledge score of parents about autistic children characteristic, nutritional requirement, and health problem were; (67.3%), (63%), and (50.8%) respectively. The overall mean score knowledge was (60.4%) which is moderate adequate knowledge.

Recommendation from the current study

- Education is the key for parents to gain knowledge about ASD.
- Conducting practical training programmer for parents on behavior modification techniques.

- Availability of nutritionist in the autistic center is highly recommended in the centers.
- Children's meal must be planned by qualified nutritionist.
- Mothers must give more attention to their children dietary habits, to ensure available dietary alternative and nutrients supplements.

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