

Determination of Knowledge of Caregivers about Dietary Practices of Autistic Children

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ABSTRACT

Background and Objective: Autism belongs to a complex neurodevelopmental disorder. The lack of knowledge about dietary practices of autistic caregivers is perceived as the triggering factor of 'Autistic Spectrum Disorder (ASD)'. In this particular 'Knowledge, Attitude and Practice (KAP) Survey' the knowledge (K) of nutrition, attitude (A) of children towards such nutrition and dietary practices (P) among the caregivers of autistic children. The pre-testing and post-testing for knowledge has been observed. The knowledge questionnaire was designed to facilitate the caregivers to determine their knowledge regarding the dietary patterns of autistic children.

Methods: This quasi-experimental study comprised of 50 caregivers (particularly mothers, and fathers in a few instances) of autistic children enrolled at Amin Maktab Center for Special Education Lahore. The nutrition education program was developed and participants were enrolled. Analysis of the change in knowledge, attitude and practice of autistic caregivers through pre-testing and post-testing at a gap of four months was carried out using statistical tests.

Results: The pre-testing and post-testing phase of the study revealed significant improvement in (a) basic knowledge about nutritional needs of autistic children (22% vs. 100%), (b) practicing patient-tailored special diet (34% vs. 92%) and (c) resolution of food allergies (62% vs. 16%) in autistic children. The most important benchmark in this regard was Body Mass Index (BMI) of children where deranged BMI improved significantly ($p = 0.000$) to normal BMI in pre- and post-testing phases.

Conclusions: Lack of knowledge is higher among aforementioned caregivers of concerned autistic children. Adoption of nutrition education programs by autistic caregivers helps in creating optimal knowledge, attitude and practices regarding nutritional needs of autistic children for effective targeted behavior and management.

KEYWORDS: Autism Spectrum Disorder (ASD), Knowledge, Dietary practice, Nutrition education.

How to Cite This:

Yaseen M, Rizwan B, Gulzar I, Khalid R, Tanveer S, Abid Z, Farooq S. Determination of knowledge of caregivers about dietary practices of autistic children. *Biomedica*. 2020; 36 (1): 59-64.

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- Received for Publication: 06-12-19
- Revision Received: 08-03-2020
- Accepted for Publication: 20-03-2020

INTRODUCTION

Autism Spectrum Disorder is a complex neurodevelopmental disorder which determines the challenges in interacting with people, repetitive, nonverbal communication, difficulty reading facial expressions and eye contact. ASD affects the brain development and the way child

interacts and communicates with others.^{1,2} Autism's core signs are social communication challenges and confined repetitive behaviors. In addition, demanding or throbbing ingest, such as gastroenteritis, allergies from food, and gastro-esophageal reflux, occasionally may lead to serious feeding issues such as pain in abdomen, constipation and diarrhea which occur in children of autism spectrum disease.³⁻⁵

Moreover, deficiency in speech and community reaction including the existence of uninteresting response and variation in the overall severity of core symptoms, as well as in the IQ and linguistic skills are noted.^{6,7} We tend to reason that nourishment, and other natural and environmental impacts, may prompt improvement in the chemical imbalances in a subset of ASD patients, that would have otherwise been triggered by certain hereditary inclinations. Therefore, such nutrition-related factors have been analyzed to particularly understand their role in the etiology of ASD and its symptoms.⁸⁻¹⁰ The nutrition education on autism is of monumental significance as it identifies the factors that triggers signs and symptoms of autism like social communication impairments, Repetitive Interests, Behaviors and Activities (RIBAs), and designed to reduce the worsening effect of autism in autistic population. It enlightens the use of suitable nutrients that lessen the condition and nutritional supplements. Furthermore, the nutrition education on autism will demonstrate its beneficial effects by facilitating the autistic caregivers in developing their understanding upon the effect of certain nutrients in relation to autism. This will, in turn, enable them to prevent the condition from worsening; additionally, will also reduce the burden of morbidity in the society. The evidence overwhelmingly suggests that the nutrition education plays a paramount role for their effective targeted behavior and management.¹¹

A major public health challenge is unhealthy food choices and practices among autistic children that are further contributing to adversity of the disorder. If concerns like lack of awareness related to physical activity, nutrition and poor health in early life are not addressed among caregivers then it may result in burden of morbidity in the society. This study was therefore designed to determine effects of nutrition education on knowledge of

caregivers of autistic children for reaching their optimal dietary practice targets.

METHODS

A quasi-experimental study, with the sample size of 50 caregivers of autistic children, employing selection criteria of non-probability convenient sampling technique was meticulously conducted. At the onset of the study, written consents were duly obtained from the associated caregivers of autistic children attending Amin Maktab Center for Special Education and Training, Lahore while suspected cases or non-cooperating caregivers were excluded from this study. The study was formally approved by the Ethical Board of the University of Lahore (UOL) vide Letter No: IRB-UOL-FAHS/482/2019. The relevant demographic information was taken along with their detailed history. Moreover, the questionnaire comprised of 10 questions upon the issue of knowledge, which had been validated by reviewing existing research and literature on the subject-matter. The study was conducted for a period that covers four calendar months, and nutrition educational programs were conducted. For such purposes, interactive, knowledge-based 'Interventional Lectures', along with other allied activities were designed to enroll the caregivers for future monitoring of knowledge. The Body Mass Index (BMI) of all enrolled children was calculated at the time of enrollment using World Health Organization index - for underweight is below 5th percentile, healthy weight BMI is equal or greater than 5th percentile and less than the 85th percentile, overweight BMI is at or above 85th percentile but less than 95th percentile and BMI for obese is at or above the 95th percentile for age, gender and height (Fig.1).

STATISTICAL ANALYSIS

All relevant data was collected from pre-tested and post-tested questionnaire and subsequently entered and analyzed by using Statistical Package for Social Sciences (SPSS version 24.0). The results were then compiled in terms of frequency and percentages. By way of statistical analyses using paired sample t-test, results were considered significant if *p-value* was observed to be < 0.05.

RESULTS

A total of 58% children were males and 42% were females. Results of pre-testing showed that 18 children were underweight, 22 were normal, 6 were overweight and 4 were obese whereas after nutrition education program 14 children were underweight, 31 children were normal, 3 were overweight and 2 were obese in post-testing (Table-1).

Final analysis of this study determined that caregivers of autistic children were not well-known about dietary knowledge for their children. Analysis showed that 22% caregivers had optimal nutritional knowledge for their children while 78% caregivers were totally unaware of any dietary influence on wellbeing of their child. At pretesting, food allergies, in particular wheat, were known to 62% children. After providing their caregivers with

Table-1: Socio-demographics of autistic children caregivers.

Demographic Profile		n (%age)	
Gender	Male	29 (58)	
	Female	21 (42)	
Socioeconomic status	< 15000-20000	16 (32)	
	> 20,000-50,000	24 (48)	
	> 100,000	10 (20)	
Caregivers Education	Primary	6 (12)	
	Secondary	15 (30)	
	Intermediate	5 (10)	
	Bachelors	11 (22)	
Age (years)	Masters	12 (24)	
	Uneducated	1 (2)	
	4 - 8	23 (46)	
	9 - 12	22 (44)	
BMI of Autistic Children	13 - 16	5 (10)	
	Underweight	Pre-testing	Post-testing
	Normal	18 (36)	14 (28)
	Overweight	22 (44)	31 (62)
	Obese	6 (12)	3 (6)
		4 (8)	2 (8)



Fig.1: Educating caregivers about nutritional needs and assessment of BMI of autistic children in Nutrition Education Programme designed by the authors.

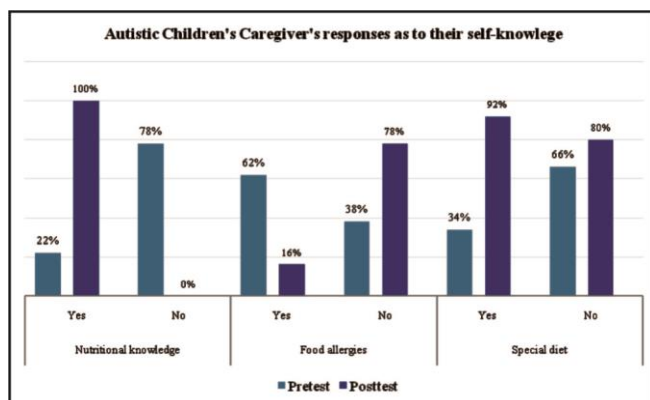


Fig.2: Knowledge of autistic children caregivers regarding dietary practices, food allergies and special diet.

nutritional knowledge about specific food allergies and ways on how to reduce these, the frequency dropped to 16% at post-testing (Fig. 2).

According to the results of pre-testing, 25% caregivers observed that autistic children were distressed by candy or salty foods while 50% caregivers considered that presenting food in small bite encourages their child to eat well. Following the adoption of the nutrition education program, 90% caregivers considered that presenting food in small bite will encourage their child to eat well.

Moreover, the following knowledge attributes were significantly raised after post-testing in caregivers (Table-2).

Table-2: Comparison between the knowledge of food allergies, special diet and nutritional knowledge in pre- and post-testing.

Comparison Between the Knowledge	Pre-test	Post-test	p-value*
	Mean (\pm S.D)	Mean (\pm S.D)	
Food Allergies	1.62 (\pm 0.490)	1.16 (\pm 0.370)	0.000
Special Diet	1.34 (\pm 0.479)	1.92 (\pm 0.274)	0.000
Nutritional Knowledge	1.22 (\pm 0.418)	2.00 (\pm 0.000)	0.000

*Paired t-test

DISCUSSION

This study has modestly attempted to fill the gap in literature from Pakistan regarding beneficial effects of nutrition education of caregivers of autistic children so as to prevent exacerbations and to reduce the burden of morbidity in the society. According to results of the present study the prevalence of autism is more in males which is concordant with Russell and colleagues¹² who reported male to female ratio of 9:1. Following review of the age range of autistic children, it was observed that maximum cases (46%) were between 4 – 8 years of age (Table-1) while a slightly higher age range was reported by Magiati et al.¹³ where children aged 3.4 years to 10.3 years were observed. This may depict that autistic disorder tends to decrease in frequency with increasing age. In this study, maximum number of cases (48%) belonged to the middle socio-economic class which is in contrast to an Omani report¹⁴ where in approximately similar frequency of patients belonged to the lower income status. This finding may link well with the level of motivation and affordability of caregivers to approach the rehabilitation centres for their children.

According to results of this study, maximum (44%) cases were having a normal BMI whereas only 8% cases were obese and a significant proportion of cases (36%) were reportedly underweight at the time of enrolment. A similar Iranian study enrolling 113 Iranian children reported maximum cases (50.4%) within desired weight while in contrast to the present study, very few (8.7%) children were underweight.¹⁵ This may reflect a big challenge faced by caregivers regarding management of optimal dietary practices in children.

The pre-testing phase of the study revealed that only 22% caregivers had basic knowledge about nutritional needs of autistic children which turned out to be a good success of nutrition education programme introduced in this study whereby 100% of the caregivers were found to have basic nutritional knowledge at post-testing phase. A similar but slightly lower success rate (94%) was reported by Zablotsky and co-investigators.¹⁶ After introduction of nutrition education programme for their enrolled subjects.

As regards the food allergies experienced by caregivers in their children and relevant knowledge about managing such issues at the time of enrolment, it was observed that with nutrition education, a significant number of food allergy issues were resolved by caregivers (38% in pre-testing VS 84% in post-test). Quite concordant results have been reported by Chaidez¹⁷ where nutrition education led to nearly 4-fold decrease in food allergy issues when pre-testing results (22%) were compared with post-testing (90%).

Pre-testing results in present study revealed that only 34% caregivers had knowledge about special dietary needs for autistic children and nutrition education enhanced this figure to 92% in post-testing. Similar results were reported by Whiteley et al.¹⁸ where very few caregivers had prior knowledge about special diet for autism. The results of pre-testing reported that 56% caregivers' feeding behavior influences the child's nutritional status, and 44% caregivers remained uninfluential in this regard. However, after implementation of the nutrition education program, 84% caregivers reported that feeding behavior did influence the child's nutritional status in post-testing. Similarly, a study conducted by Sharp et al.¹⁹ who evaluated children (age 2 to 17 years) with ASD with severe food selectivity and feeding behavior during a 24-month period, it was concluded that ASD children avoided healthy food and demonstrated resistive feeding behavior towards a diverse range of food items that may be the underlying cause of increased risk for nutritional inadequacies in these children. The same pattern of food selectivity was observed in children enrolled in the current study whereby nutritional education improved the support and motivation shown by caregivers

towards their children for curbing food-selectivity pattern in diets.

CONCLUSION

Maintenance of nutritional balance and optimal dietary intake remains a big challenge for caregivers of autistic children. Interventions relating to patient-tailored nutrition education are indispensable, especially in developing countries, for better prognosis and management of children with autism.

LIMITATIONS OF STUDY

The limitations of this study are that this is a single-centered study with small sample size. A series of future studies are recommended with larger sample size to establish significant correlations among various parameters and dietary interventions in autistic children.

ACKNOWLEDGEMENT

The authors are immensely thankful to Dr. Suriyya Yasmeen Shah, Director, Amin Maktab Centre for Special Education and Training, Lahore in serving us in order to collect data pertaining to children with 'Autism Spectrum Disorder (ASD)'.

CONFLICT OF INTEREST

None to declare.

FINANCIAL DISCLOSURE

None to disclose.

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Author's Contribution

MY: Conception and design of study, data interpretation.

BR: Drafting and final approval of the version to be published.

IG: Data analysis and interpretation.

RK: Acquisition of data and drafting.

ST: Critical revision of the manuscript for intellectual content.

ZA: Data interpretation.

SF: Final approval of manuscript.