

Effect of Dietary Patterns on Gastrointestinal Symptoms among Children with Autistic Spectrum Disorder

Lina N. Sajad Al-Joburi^{1*}, Abdul Mahdi A. Hasan², Ameera Jasim Al-Aaraji³

^{1,2}College of Nursing, University of Babylon, Iraq.

E-mail: linanidhal90@gmail.com

³Basic Medical Sciences Department, University of Babylon, Iraq.

Abstracts: To determine the effect of dietary pattern on gastrointestinal symptoms among children with autistic spectrum disorder. A descriptive correlational study designed to determine the effect of dietary pattern on gastrointestinal symptoms among children with autistic spectrum disorder for the period of October 20th 2021 to May 15th 2023. A nonprobability, purposive, sample of (150) parent of children with autistic spectrum disorder is selected for the purpose of the study. All parents have signed consent form for their agreement to participate in the study and to ensure confidentiality, as well as to confirm the ethical considerations. A developed questionnaire is used for the purpose of the current study. The questionnaire is comprised of (4) parts that include: parents' socio-demographic characteristics (15) item; children's socio-demographic characteristics (12) item; dietary patterns (16) item and gastrointestinal symptoms (14) item. Content validity of the questionnaire is determined through panel of (20) expert in the fields of Pediatric Nursing, Pediatric Medicine and Community Health Nursing. Internal consistency reliability of the questionnaire is obtained through the use of split-half technique. Cronbach alpha correlation coefficient is computed for such reliability; ($r=0.81$) for dietary patterns and ($r=0.78$) for gastrointestinal symptoms. Data are collected through the use of the study questionnaire. Data are analyzed through the use of the descriptive statistical data analysis approach of frequency, percent, mean, standard deviation, total scores and range and inferential statistical data analysis approach of multiple linear regressions. The study findings indicate that children have experienced problems with their dietary patterns and such patterns have highly significant effect on gastrointestinal symptoms among children with autistic spectrum disorder evidenced by highly significant p-value of (0.001). The study confirms that there is highly significant effect between dietary patterns and gastrointestinal symptoms among children with autistic spectrum disorder.

Keywords: Dietary patterns, Gastrointestinal symptoms, Children, Autistic spectrum disorder.

1. INTRODUCTION

Autism is an enigmatic condition, with no knowledge about its origins, the only statement that may be used to describe autism was "there is no idea" and we now know that there is no particular explanation for autism and that there are many forms of autism, and fortunately experts have recently begun to provide answers¹. Autistic Spectrum Disorder (ASD) is a broad term for a disease that affects around one in every (68) school-aged children. It affects boys 4 times more often than girls². The origin of eating abnormalities in ASD children is believed to be multifactorial, including behavioral, cognitive, and environmental causes. In particular, among the behavioral factors that can condition eating behaviors, there are the symptoms of repetitiveness and rituals, including fear of novelty, inflexibility, need for sameness, but also hypo or hyper-reactivity to sensory stimuli. The alteration of the sensory processing described in ASD patients³. It is declared that autistic children often suffer gastrointestinal difficulties consistent with altered composition of gut microbial inhabitants. Gastro-intestinal (GI) symptoms, such as abdominal pain, gaseousness, diarrhea, constipation and flatulence are common in autism patients. The prevalence of GI symptoms in autistic children ranges from 23 to 70%. Moreover, the observed GI symptoms are associated with the severity of autism. But, other studies suggested imbalances in the gut microbial plays an important role in the etiology of autism⁴. Based on the early stated evidence, the present study ought to investigate the relationship between dietary patterns and gastrointestinal symptoms of children with autistic spectrum Disorder.

2. METHODOLOGY

A descriptive study is designed to determine the relationship between dietary pattern and gastrointestinal symptoms of children with autistic spectrum disorder for the period of October 20th 2021 to May 15th 2023. A nonprobability, convenient, sample of (150) parent of children with autistic spectrum disorder is selected for the purpose of the study. All parents have signed consent form for their agreement to participate in the study and to ensure confidentiality, as well as to confirm the ethical considerations. A developed questionnaire is used for the purpose of the current study. The questionnaire is comprised of (4) parts that include: parents' socio-demographic

characteristics (15) item; children's socio-demographic data (12) item; dietary patterns (16) item and gastrointestinal symptoms (14) item. Content validity of the questionnaire is determined through panel of (20) expert in the fields of Pediatric Nursing, Pediatric Medicine and Community Health Nursing. Internal consistency reliability of the questionnaire is obtained through the use of split-half technique. Cronbach alpha correlation coefficient is computed for such reliability; (r=0.81) for dietary patterns and (r=0.78) for gastrointestinal symptoms. Data are collected through the use of the study questionnaire. Data are analyzed through the use of the descriptive statistical data analysis approach of frequency, percent, mean, standard deviation, total scores and range and inferential statistical data analysis approach of multiple linear regressions.

Table 1. Overall Assessment of Dietary Patterns among Children with Autistic Spectrum Disorder.

Dietary Patterns	F	%	M	SD
Poor	23	15.3	92.65	28.219
Moderate	104	69.4		
Good	23	15.3		
Total	150	100		

Note: F: Frequency, %: Percentage, M: Mean, SD: Standard Deviation, Poor = 0 – 61.66, Moderate = 61.67 – 123.33, Good = 123.34 – 185.

3. RESULTS

This table indicates that children with autistic spectrum disorder have moderate dietary patterns ($M \pm SS = 92.65 \pm 28.219$) in which (69.4%) of them seen with moderate level of dietary patterns.

Table 2. Overall Assessment of Gastrointestinal Symptoms among Children with Autistic Spectrum Disorder.

Symptoms	F	%	M	SD
No problems	21	14	11.85	4.680
Mild problems	91	60.7		
Moderate problems	33	22		
Severe problems	5	3.3		
Total	150	100		

Note: F: Frequency, %: Percentage, M: Mean, SD: Standard Deviation, No problem = 0 – 7, Mild = 7.1-14, Moderate = 14.1 – 21, Severe = 21.1 – 28.

This table indicates that children with autistic spectrum disorder have mild to moderate gastrointestinal problems ($M \pm SS = 11.85 \pm 4.680$) in which (60.7%) of them seen with mild problems and (22%) are with moderate problems.

Table 3. Multiple Linear Regression Analysis for Measuring Effect of Dietary Patterns on Gastrointestinal Symptoms among Children with Autistic Spectrum Disorder.

GI Symptoms Variables	Unstandardized Coefficients		Standardized Coefficients	t-test	Significance
	B	Std. Error	Beta		
Dietary Patterns	0.043	0.012	0.258	3.469	0.001

Note: a. Dependent variable: Gastrointestinal Symptoms (GI).

This table indicates that dietary patterns have high effect on gastrointestinal symptoms among autistic children evidenced by significant difference at p-value of (0.001).

4. DISCUSSION

The results of existing study indicate that children with autism associated with moderate dietary patterns in which more than two third of them seen with moderate level of dietary patterns. The findings of the recent study are in the same line with ⁶ who has reported that majority of the children had moderate dietary pattern. In the same direction, ⁷⁻⁹ have carried out a study to explore the association between dietary quality and executive functions in

children with ASD and illustrated that as being compared to typical development children, children with ASD had a higher proportion of moderate dietary intake and moderate level of unbalanced dietary intake. This is may be due to insufficient and unbalanced dietary intake problems may be caused by the following factors. First, children with ASD often exhibit repetitive and stereotypical behaviors and other uncontrolled behaviors at mealtimes. These behaviors put them at higher risk for eating problems such as food rejection, high frequency of single food intake. As well, according to a study findings that it is may be due to autism spectrum disorder as a condition that is accompanied by high food selectivity, and children with ASD have reported that texture, appearance, brand, packaging, temperature, food presentation, color, taste and smell are all characteristics that influence on children's food choices¹⁰⁻¹³. It is indicated that children with autism are identified to have mild to moderate gastrointestinal problems in which more than half of them are seen with mild problems and highest percentage is with moderate problems. A cross-sectional study is carried out by to find that children with ASD significantly have higher gastrointestinal symptoms, such as constipation, bloating, and abdominal pain¹⁴. The cause of these GI problems is unclear, but it appears to partly relate to abnormal gut flora and possibly to the excessive use of oral antibiotics which can alter gut flora. Several studies by our group and others have reported significantly higher oral antibiotic use in children with autism vs. typical children. Oral antibiotics were primarily used for treating otitis media (ear infections), which may suggest an impaired immune system. Commonly used oral antibiotics eliminate almost all of the normal gut micro biota, which play an important role in the breakdown of plant polysaccharides, promoting gastrointestinal motility, maintaining water balance, producing some vitamins, and competing against pathogenic bacteria. Loss of normal gut flora can result in the overgrowth of pathogenic flora, which can in turn cause constipation and other problems¹⁵. It is indicated that dietary patterns have high effect on gastrointestinal symptoms among autistic children evidenced by significant differences at p-value of (0.001). Such finding is consistent with that of a study conducted about eating and feeding problems and gastrointestinal dysfunction of Autistic Spectrum Disorders and their results indicate that there is a strong relationship and significant correlations between eating problems and gastrointestinal dysfunction¹⁶. In contrast with another study that is carried out by¹³ who has reported that no statistically significant correlation is found between parent-reported FS and GI symptoms. This may be due to certain foods that can cause exacerbate gastrointestinal (GI) problems, such as reflux and abdominal pain that they may be suffering from.

5. CONCLUSION

Based on the interpretation and discussion of the study findings, the study can conclude that: Children with autistic spectrum disorder have experienced problems with their dietary patterns and the study confirms that there is highly significant relationship between dietary patterns and gastrointestinal symptoms among children with autistic spectrum disorder.

REFERENCES

- [1] Yasir M, Khudhair S. Assessment of Nurses' Knowledge toward Alternative Communication Strategies for Children with Autism Spectrum Disorder at the Autism Centers in Dhi Qar Governorate. *Kufa Journal for Nursing Sciences*. 2021 Dec 30;11(2):181-8.
- [2] AL-Shimery EH, Hassan MJ, AL-Ghabban MH. Autism among children attending pediatric psychiatric department in child's central teaching hospital in Baghdad: a descriptive study. *The Iraqi postgraduate medical journal*. 2011;10(4).
- [3] Margari L, Marzulli L, Gabellone A, de Giambattista C. Eating and mealtime behaviors in patients with autism spectrum disorder: current perspectives. *Neuropsychiatric disease and treatment*. 2020 Sep 11:2083-102.
- [4] Abbas FN, AbbasMunshed F, Issa AH. Gut Flora in Autistic Children as Biomarker for Autism in Thi-Qar Province/Iraq. *Age*. 2020 Dec 6;1:2.
- [5] Ibrahim RM, Idrees NH, Younis NM. Epidemiology of leukemia among children in Nineveh Province, Iraq. *Rawal Medical Journal*: 2023 Jan. Vol. 48, (1):137-.
- [6] Mohammad FH, Noori LK, Younis NM. Assessment of Nutritional habits among Mosul University Students regarding breakfast. 2023 Jan. Vol. 48, (1):96-.
- [7] Ahumada D, Guzmán B, Rebolledo S, Opazo K, Marileo L, Parra-Soto S, Viscardi S. Eating Patterns in Children with Autism Spectrum Disorder. *InHealthcare* 2022 Sep 21 (Vol. 10, No. 10, p. 1829). MDPI.
- [8] Kumar S, Venkatakrishna S, Ruth S, Kota S, Nanjappa VB. A Cross-sectional Study of Prevalence of Autism Spectrum Disorder among Children Referred for the Assessment of Intellectual Disability for Certification and Its Association with Behavioral and Medical Issues. *Indian Journal of Private Psychiatry*. 2021 Jan;15(1):38-41.
- [9] Adams JB, Johansen LJ, Powell LD, Quig D, Rubin RA. Gastrointestinal flora and gastrointestinal status in children with autism—comparisons to typical children and correlation with autism severity. *BMC gastroenterology*. 2011 Dec;11(1):1-3.

- [10] Vissoker RE, Latzer Y, Gal E. Eating and feeding problems and gastrointestinal dysfunction in Autism Spectrum Disorders. *Research in Autism Spectrum Disorders*. 2015 Apr 1;12:10-21.
- [11] Bura'a LN, Younis NM. Nurses knowledge regarding to phototherapy at neonatal care units in Mosul City, Iraq. *Rawal Medical Journal*. 2023 May 27;48(2):379-.
- [12] Ahumada D, Guzmán B, Rebolledo S, Opazo K, Marileo L, Parra-Soto S, Viscardi S. Eating Patterns in Children with Autism Spectrum Disorder. *InHealthcare* 2022 Sep 21 (Vol. 10, No. 10, p. 1829). MDPI.
- [13] Diolordi L, del Balzo V, Bernabei P, Vitiello V, Donini LM. Eating habits and dietary patterns in children with autism. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*. 2014 Sep;19:295-301.
- [14] Ali HA, Abbas FF, Younis NM. Mothers' knowledge and attitudes towards breastfeeding in Thi-Qar City, Iraq. *Rawal Medical Journal*. 2023 May 27;48(2):514-.
- [15] Bandini LG, Anderson SE, Curtin C, Cermak S, Evans EW, Scampini R, Maslin M, Must A. Food selectivity in children with autism spectrum disorders and typically developing children. *The Journal of pediatrics*. 2010 Aug 1;157(2):259-64.
- [16] Lázaro CP, Pondé MP. Narratives of mothers of children with autism spectrum disorders: focus on eating behavior. *Trends in psychiatry and psychotherapy*. 2017 Jul;39:4-11.

DOI: <https://doi.org/10.15379/ijmst.v10i2.1396>

This is an open access article licensed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/3.0/>), which permits unrestricted, non-commercial use, distribution and reproduction in any medium, provided the work is properly cited.