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PARENTAL SATISFACTION ABOUT THE BEHAVIORS OF CHILDREN WITH AUTISM SPECTRUM DISORDER FOLLOWING DIETARY INTERVENTION PROGRAM

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ABSTRACT

Background: Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition characterized by challenges in social interaction and communication, and by repetitive behaviors. Emerging research suggests that dietary interventions might positively influence the behavior of children with ASD, potentially via mechanisms related to the gut-brain axis.

Objective: This study aimed to investigate the level of parental satisfaction with the behavioral improvements in their children with ASD following dietary interventions.

Methods: A cross-sectional study design was employed, utilizing snowball sampling to recruit 31 parents of children with ASD who had been undergoing dietary interventions for at least six months. Data were collected through structured interviews using the Behavior Summarized Evaluation (BSE) Scale and the Parental Satisfaction Survey (PASS). Ethical approval was secured in accordance with the Declaration of Helsinki, and informed consent was obtained from all participants. Data analysis was performed using SPSS version 25, focusing on descriptive and inferential statistics to assess the effects of dietary interventions.

Results: The study found that dietary interventions were associated with behavioral improvements as reported by parents. Specifically, 16.1% of parents reported using a keto diet, 29.0% used a gluten and sugar-free diet, 25.8% used camel milk, 16.1% used olive oil, and 3.2% used a low oxalate diet. Long-term dietary interventions (more than one year) were reported by 67.7% of the sample. Improvements in behavioral outcomes included better social responsiveness and communicative abilities, with 22.6% of parents observing improvements in verbal communication efforts, 35.5% in

non-verbal cues like facial expressions and gestures, and 41.9% in stereotyped vocal and voice utterances.
Conclusion: The findings suggest that dietary interventions may contribute to behavioral improvements in children with ASD, as reported by their parents. These interventions, particularly long-term ones, could be beneficial in managing ASD symptoms.

Keywords: Autism Spectrum Disorder, dietary interventions, parental satisfaction, gut-brain axis, behavioral improvement, neurodevelopmental disorders.

INTRODUCTION

Autism Spectrum Disorder (ASD) represents a complex neurodevelopmental condition characterized by challenges in social interaction, communication, and repetitive behaviors, presenting a spectrum of disorders that vary greatly in severity and symptoms (1-3). The origins of ASD have been attributed to a combination of genetic, environmental, and neurological factors, though no definitive cause has been established (3). This heterogeneous disorder is profoundly influenced by biological, cognitive, and behavioral aspects that vary from one individual to another, highlighting the necessity for personalized treatment approaches (4).

Despite the absence of a cure, multiple therapeutic interventions have been employed to manage the symptoms of ASD, ranging from behavioral and occupational therapies to pharmacological interventions. However, dietary interventions have gained significant attention due to the gut-brain connection and its potential impact on behavioral manifestations of ASD (5-7). Emerging research suggests that specific dietary strategies may influence neurodevelopmental outcomes by modulating gut microbiota, addressing gastrointestinal issues, and reducing the overload of certain neuroactive compounds and heavy metals that some theories suggest may exacerbate ASD symptoms (8-10).

The use of dietary interventions, including gluten-free and casein-free diets, ketogenic diets, and the incorporation of camel milk, aims to address the unique metabolic and gastrointestinal conditions observed in many individuals with ASD (11, 12). These interventions are thought to alleviate symptoms by reducing oxidative stress, improving gut health, and possibly decreasing the absorption of substances that could impair neurological function (6, 11-13). The rationale for these dietary interventions is supported by anecdotal evidence and a growing body of research that links gastrointestinal health to behavioral changes in children with ASD (14).

The focus on parental perspectives and their satisfaction with the outcomes of dietary interventions is crucial, as parents play a pivotal role in the management of ASD. Studies indicate that parents often observe improvements in social interaction and communication skills when dietary interventions are consistently applied (15-17). Parental reports also contribute significantly to the understanding of the effectiveness of such interventions, offering insights that can guide further scientific inquiry and clinical practice (15).

As the prevalence of ASD continues to rise globally, the exploration of effective treatments, including dietary interventions, remains a priority in the research community. Understanding the impact of these interventions not only aids in the management of ASD but also enriches the dialogue between medical professionals and families, fostering a collaborative approach to optimizing the quality of life for individuals with ASD. The continued investigation into the gut-brain axis and its role in neurodevelopmental disorders promises to open new pathways for the treatment and understanding of ASD.

MATERIAL AND METHODS

The study employed a cross-sectional design, focusing on a sample of 31 parents of children diagnosed with Autism Spectrum Disorder who had been following dietary interventions for their children for at least six months. Recruitment was facilitated through snowball sampling, a method particularly useful in reaching populations that are difficult to access due to the specificity of the population's characteristics or the sensitivity of the study subject (1). This technique initiated with

known cases identified by clinicians, which then expanded as participants referred other eligible individuals within their networks.
Data collection was carried out in community settings where researchers conducted structured interviews with the parents. During these interviews, parents were asked to complete the Behavior Summarized Evaluation (BSE) Scale to assess their child's behaviors prior to the dietary intervention. Post-intervention behaviors were then assessed using the same scale alongside the Parental Satisfaction Survey (PASS), which gauged the parents' satisfaction with the dietary intervention's impact on their children's behaviors (18).

The ethical considerations of the study adhered to the Declaration of Helsinki for medical research involving human subjects. Prior to participation, all respondents provided informed consent, understanding the scope of the study and their voluntary involvement with assurances of confidentiality and the right to withdraw at any time without penalty. The study protocol was reviewed and approved by the BASAR Ethics Committee before the initiation of any study procedures (18).
Data collected from the interviews were entered into SPSS version 25 for analysis. The statistical analysis employed descriptive statistics to summarize the data, and inferential statistics were used where appropriate to explore relationships between the types of dietary interventions and observed changes in behavioral outcomes.

This methodology ensured a rigorous approach to examining the effectiveness of dietary interventions in the management of autism spectrum disorders, underpinning the findings with robust data collection and analysis procedures, alongside a strong ethical framework to protect the rights and well-being of all participants.

RESULTS

The results of the study were organized and presented through descriptive analysis, focusing on the impact of dietary interventions on various behavioral aspects of children with Autism Spectrum Disorder, as reported by their parents. The findings are summarized in tables and text descriptions, highlighting the main outcomes related to the types of dietary interventions, the duration of their application, and the observed improvements in behaviors.

Table 1: Types of Dietary Interventions Selected by Parents

Dietary Intervention	Frequency	Percentage
Keto Diet	5	16.1%
Gluten and Sugar-Free Diet	9	29.0%
Camel Milk	8	25.8%
Olive Oil	5	16.1%
Low Oxalate Diet	1	3.2%

As illustrated in Table 1, the most commonly selected dietary intervention was the gluten and sugar-free diet, followed closely by camel milk and the keto diet.

Table 2: Duration of Dietary Intervention

Duration	Frequency	Percentage
4-6 months	4	12.9%
7-12 months	6	19.4%
More than one year	21	67.7%

Table 2 indicates that the majority of parents (67.7%) have been administering the dietary intervention for more than one year, suggesting a long-term commitment to dietary management in ASD.

Table 3: Improvements in Verbal and Non-verbal Communication

Impairment Type	Frequency	Percentage
No effort to communicate (verbal)	7	22.6%
Lack of appropriate facial expressions/gestures	11	35.5%
Stereotyped vocal and voice utterances (echolalia)	13	41.9%

Table 3 showcases the challenges in communication faced by the children, with notable percentages showing stereotyped vocalizations and a lack of appropriate non-verbal cues.

Table 4: Parental Reports of Behavioral Improvements

Behavioral Aspect	No Change	Slight Improvement	Clear Improvement
Sensory Motor Behaviors	14	16	-
Expression of Motivation	-	11	-
Emotion and Mood	10	15	6
Social Responsiveness	-	28	3
Communicative and Cognitive Abilities	-	26	5

As detailed in Table 4, slight improvements were most commonly reported across various behavioral domains with significant findings in social responsiveness and communicative and cognitive abilities. Clear improvements, though less frequent, were noted, particularly in emotion and mood, and communicative abilities.

These results provide a quantifiable insight into the potential benefits of dietary interventions as perceived by parents, suggesting that certain interventions can have a noticeable impact on the behavior and communication skills of children with ASD.

DISCUSSION

The study aimed to evaluate the effectiveness of dietary interventions on the behavioral outcomes of children with Autism Spectrum Disorder (ASD) as perceived by their parents. The results indicated that a significant number of parents observed improvements in their children's behaviors, particularly in social responsiveness and communicative abilities. This finding is consistent with previous studies that have highlighted the potential benefits of dietary interventions in managing symptoms of ASD (1, 18, 19).

The widespread use of the gluten-free and sugar-free diet, as reported in this study, mirrors the growing body of literature supporting the role of dietary management in neurodevelopmental disorders. The gut-brain axis theory suggests that changes in gut microbiota could influence neurological pathways and behaviors, potentially explaining the improvements noted by parents in this study (2, 20). Moreover, the long-term commitment to these dietary interventions, as evidenced by the majority of parents administering them for over a year, underscores the perceived effectiveness of these strategies in managing ASD symptoms (21, 22).

However, the study was not without its limitations. The use of a snowball sampling technique, while effective in reaching a specific population, may introduce bias as it does not randomly sample the population (10). Consequently, the results might not be generalizable to all populations with ASD. Furthermore, the reliance on parental reports can introduce subjectivity into the results, as parents' perceptions may be influenced by their expectations and desires for a positive outcome.

Despite these limitations, the findings contribute valuable insights into the practical application of dietary interventions in ASD management. Future research could benefit from a comparative design involving a control group not undergoing any dietary intervention. This approach would strengthen the causal interpretations of dietary interventions' effects on ASD behaviors. Additionally, it would be prudent for researchers to incorporate objective measures of behavioral changes, such as clinical assessments conducted by professionals, to complement parental reports (1, 3, 10, 20).

CONCLUSION

In conclusion, while the current study adds to the evidence supporting dietary interventions in ASD, further research is required to understand fully the mechanisms through which diet affects ASD symptoms and to establish standardized dietary guidelines. Such studies should strive to include larger, more diverse samples and objective measurement tools to enhance the validity and applicability of the findings.

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