

Article history: Received 25 March 2024 Revised 08 June 2024 Accepted 14 June 2024 Published online 01 July 2024

# Psychological Research in Individuals with Exceptional Needs



Volume 2, Issue 3, pp 29-36

# Nutritional Challenges and Eating Habits in Children with Sensory Processing Disorders

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### Article Info

Article type: Original Research

### How to cite this article:

Moore, I. (2024). Nutritional Challenges and Eating Habits in Children with Sensory Processing Disorders. *Psychological Research in Individuals with Exceptional Needs*, 2(3), 29-36. https://doi.org/10.61838/kman.prien.2.3.5



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### ABSTRACT

The objective of this study was to explore the nutritional challenges and eating habits of children with Sensory Processing Disorders (SPD) through qualitative analysis. The focus was on identifying specific sensory sensitivities, emotional and behavioral impacts, and effective management strategies to improve nutritional outcomes. This qualitative study involved semi-structured interviews with caregivers of 20 children aged 4-12 years diagnosed with SPD. Participants were recruited from pediatric therapy centers, support groups, and online forums. Data were collected until theoretical saturation was reached. The interviews were transcribed and analyzed using thematic analysis to identify key themes and patterns related to eating behaviors and nutritional challenges. The analysis revealed five main sensory challenges impacting eating habits: texture sensitivity, taste sensitivity, smell sensitivity, visual sensitivity, and temperature sensitivity. Emotional and behavioral impacts included mealtime anxiety, food refusal, and social isolation. Various strategies were employed by parents and professionals to manage these challenges, such as implementing food routines, gradual food exposure, and sensory integration therapy. The study also highlighted nutritional deficiencies and growth concerns associated with restricted diets in children with SPD, as well as success stories where tailored interventions led to improvements in eating habits and overall nutritional status. Children with SPD face significant sensory, emotional, and behavioral challenges that impact their eating habits and nutritional intake. Tailored interventions that address individual sensory profiles and involve a collaborative approach between parents, educators, and healthcare professionals are crucial for managing these challenges effectively. The study underscores the need for ongoing research and practical strategies to support better nutritional outcomes for children with SPD.

**Keywords:** Sensory Processing Disorder, eating habits, nutritional challenges, qualitative study, children, sensory sensitivity, parental strategies, therapeutic interventions.

### 1. Introduction

Sensory Processing Disorder (SPD) is a condition in which the brain has difficulty receiving and responding to information that comes in through the senses (Bell et al., 2017; Engel-Yeger et al., 2015; Luciana de Barros Correia, 2018; Nadon et al., 2011; Roriz, 2023; Smith, 2016). Children with SPD often face significant challenges in their daily lives, including eating and nutritional issues. SPD can manifest in various ways, impacting the child's ability to perform everyday tasks, including eating (Smith, 2016). Children with SPD may exhibit heightened sensitivity to textures, tastes, smells, and even the visual appearance of food, leading to food selectivity and restrictive eating patterns (Cermak et al., 2010). These eating difficulties can result in poor nutritional intake and associated health risks (Engel-Yeger et al., 2015).

The interplay between sensory and motor problems in children with SPD and their impact on daily living activities, including eating, has been well-documented. Research has shown that children with autism spectrum disorder (ASD), who often have comorbid SPD, face significant challenges in their daily living tasks due to sensorimotor issues (Withrow & Alvidrez, 2019). These difficulties extend to eating behaviors, where sensory sensitivities can lead to extreme food selectivity and mealtime battles (Dovey et al., 2019).

Cultural and socioeconomic factors also play a significant role in shaping the eating habits of children with SPD. For example, a study on Sundanese children's eating culture in Tangerang, Indonesia, highlighted how cultural practices and socioeconomic status influence dietary habits and nutritional status. Similarly, research from Southern Italy demonstrated how food selectivity in children with autism spectrum disorder is influenced by regional dietary patterns and family practices (Alibrandi, 2023).

Psychological factors, such as anxiety and self-disgust, can further complicate eating behaviors in children with SPD. Bell, Coulthard, and Wildbur (2017) found that self-disgust is significantly associated with sensory processing issues and anxiety, which can exacerbate eating disorders (Bell et al., 2017). Additionally, military experience has been shown to influence women's eating habits, suggesting that stress and trauma can have long-term effects on eating behaviors (Breland et al., 2017).

The role of parents and family dynamics in the development of children's eating behaviors cannot be overstated. Research indicates that parental eating habits and attitudes significantly influence those of their children, particularly in families where mothers have eating disorders (Stein et al., 1995; Stein et al., 2006). Moreover, the influence of maternal nutritional behavior on the eating habits of children with excess body weight underscores the importance of family interventions in addressing eating issues (Straczek et al., 2021).

Interventions aimed at addressing feeding and eating problems in children with SPD often involve behavioral therapy and sensory integration techniques. However, the effectiveness of these interventions can vary. Dumont et al. (2023) conducted a retrospective chart review to identify factors that influence the success of behavior therapy in children with feeding problems, highlighting the need for tailored approaches based on individual sensory profiles (Dumont et al., 2023).

The relationship between sensory processing disorders and eating problems has been explored extensively, revealing significant correlations between sensory sensitivity and nutritional outcomes. Nadon et al. (2011) found that children with autism spectrum disorders and comorbid sensory processing issues are more likely to experience eating problems, leading to nutritional deficiencies and growth concerns (Nadon et al., 2011). Similarly, atypical sensory processing has been linked to lower body mass index and increased eating disturbances in individuals with anorexia nervosa (Saure et al., 2022).

Qualitative studies provide valuable insights into the lived experiences of children with SPD and their families. For instance, Kinnaird et al. (2019) conducted an exploratory qualitative study on eating as an autistic adult, revealing the complexities of sensory processing issues and their impact on food choices. These findings underscore the importance of understanding individual experiences to develop effective interventions (Kinnaird et al., 2019).

Practitioners working with children with SPD need to consider a range of factors when addressing eating and nutritional issues. McIntosh, Kandiah, and Boucher (2019) emphasized the importance of practical considerations for school nurses in improving the nutrition of children with autism spectrum disorder, including collaboration with parents and educators (McIntosh et al., 2019).

The objective of this study was to explore the nutritional challenges and eating habits of children with Sensory Processing Disorders (SPD) through qualitative analysis. The focus was on identifying specific sensory sensitivities, emotional and behavioral impacts, and effective management strategies to improve nutritional outcomes.



### 2. Methods and Materials

### 2.1. Study Design and Participants

This qualitative study was designed to explore the nutritional challenges and eating habits in children with Sensory Processing Disorders (SPD). Given the nuanced and personal nature of eating behaviors and sensory processing, a qualitative approach was selected to gather in-depth insights directly from those affected and their caregivers.

Participants were recruited through various channels, including pediatric therapy centers, support groups for SPD, and online forums dedicated to sensory processing issues. Inclusion criteria were:

- Children aged 4-12 years diagnosed with Sensory Processing Disorder.
- Willingness of both the child and the caregiver to participate in the study.
- Fluency in English to ensure clear communication during interviews.

In total, 20 participants were recruited, ensuring a diverse representation of age, gender, and severity of SPD. This sample size was deemed sufficient to reach theoretical saturation, the point at which no new information or themes are observed in the data.

### Data Analysis

The transcribed interviews were analyzed using thematic analysis, a method well-suited for identifying, analyzing, and reporting patterns (themes) within qualitative data. The analysis followed these steps:

Familiarization: Researchers immersed themselves in the data by reading and re-reading the transcripts and listening to the audio recordings.

Coding: Initial codes were generated systematically across the entire dataset. These codes represented meaningful units of data related to the research questions.

Theme Development: Codes were then collated into potential themes. Themes were reviewed and refined to ensure they accurately represented the data and were distinct from each other.

Defining and Naming Themes: Each theme was defined clearly and given a concise name that captured its essence.

Writing the Report: The final step involved weaving the themes into a coherent narrative, supported by direct quotes from the interviews to illustrate the findings.

### 2.2. Measure

#### 2.2.1. Semi-Structured Interview

Data were collected through semi-structured interviews, which allowed for a flexible yet focused exploration of participants' experiences. The interviews were conducted with caregivers, with some sessions including the children when appropriate and feasible. The interviews covered several key topics:

- Daily eating habits and routines.
- Specific sensory challenges related to food textures, tastes, and smells.
- Strategies used to encourage healthy eating.
- Emotional and social impacts of feeding difficulties.

Each interview lasted between 45 to 60 minutes and was conducted either in person or via video call, depending on the participants' preferences and logistical constraints. All interviews were audio-recorded with participants' consent and subsequently transcribed verbatim for analysis.

### 2.3. Data Analysis

Data analysis followed the principles of thematic analysis, as outlined by Braun and Clarke (2006). The steps involved were:

Familiarization with the Data: Transcriptions of the interviews were read multiple times to immerse in the data.

Generating Initial Codes: Data were coded systematically using NVivo software. Codes were assigned to meaningful segments of text that captured key concepts related to the research questions.

Searching for Themes: Codes were grouped into potential themes by identifying patterns and relationships among them.

Reviewing Themes: Themes were reviewed and refined to ensure they accurately represented the data and were distinct from each other.

Defining and Naming Themes: Each theme was defined clearly, and sub-themes were identified where necessary.

Producing the Report: A coherent narrative was developed around the themes, supported by direct quotes from the interviews to illustrate key points.

To ensure the credibility and trustworthiness of the findings, several strategies were employed:

Member Checking: Participants were invited to review the preliminary findings to confirm that their experiences were accurately represented.



Peer Debriefing: The analysis process was discussed with peers and experts in the field to ensure the validity of the themes.

Triangulation: Data were compared with existing literature on sleep disorders in children with ASD to enhance the robustness of the findings.

### 3. Findings and Results

The study included a diverse group of 20 participants, comprised of children aged between 4 and 12 years, all diagnosed with Sensory Processing Disorder (SPD). The sample consisted of 12 boys and 8 girls, reflecting the general prevalence of SPD which tends to be higher in males. The participants were recruited from various geographic locations, including urban, suburban, and rural

### Table 1

Themes, Subthemes, and Concepts

areas, ensuring a wide representation of different environments and socioeconomic backgrounds.

The age distribution was as follows: 5 participants were aged 4-6 years, 7 participants were aged 7-9 years, and 8 participants were aged 10-12 years. Regarding the severity of SPD, the majority of the children (14 out of 20) were reported to have moderate to severe symptoms, while the remaining 6 had mild to moderate symptoms. Additionally, 15 of the children were currently receiving some form of therapeutic intervention, such as occupational therapy or sensory integration therapy, and 5 were not receiving any formal therapy at the time of the study.

Overall, this diverse sample allowed for a comprehensive exploration of the nutritional challenges and eating habits experienced by children with SPD across different age groups, severities of the disorder, and therapeutic backgrounds.

Categories	Subcategories	Concepts
1. Sensory Challenges in Eating	1.1 Texture Sensitivity	Aversion to crunchy foods, Preference for smooth textures, Difficulty with mixed textures
	1.2 Taste Sensitivity	Extreme pickiness, Avoidance of strong flavors, Preference for bland foods
	1.3 Smell Sensitivity	Aversion to strong smells, Preference for mild-smelling foods, Impact of cooking smells on eating
	1.4 Visual Sensitivity	Dislike of certain colors, Need for visually appealing food presentation, Impact of food appearance on willingness to eat
	1.5 Temperature Sensitivity	Preference for specific food temperatures, Aversion to hot or cold foods, Challenges with temperature changes in food
2. Emotional and Behavioral Impacts	2.1 Anxiety and Stress	Mealtime anxiety, Fear of trying new foods, Stress around social eating situations
	2.2 Behavioral Responses	Food refusal, Meltdowns during meals, Selective eating behaviors
	2.3 Social Implications	Isolation from peers, Impact on family meals, Difficulty in social dining environments
	2.4 Coping Mechanisms	Use of comfort foods, Seeking familiar foods, Avoidance of eating in unfamiliar settings
3. Strategies for Managing Eating Habits	3.1 Parental Strategies	Implementing food routines, Gradual food exposure, Positive reinforcement
	3.2 Professional Interventions	Occupational therapy, Sensory integration therapy, Nutritional counseling
	3.3 Environmental Modifications	Creating a calm eating environment, Reducing sensory distractions, Use of sensory- friendly utensils and plates
	3.4 Adaptive Techniques	Introducing new foods in small amounts, Combining preferred and non-preferred foods, Adjusting food textures and temperatures
	3.5 Peer and Social Support	Support groups for parents, Encouraging peer modeling, Educating friends and family about SPD and its impact on eating
	3.6 Educational Resources	Books and articles on SPD and eating, Workshops for parents, Online resources and forums
4. Nutritional Outcomes	4.1 Nutritional Deficiencies	Low intake of fruits and vegetables, Limited variety in diet, Risk of micronutrient deficiencies
	4.2 Growth and Development Concerns	Impact on weight gain, Potential for stunted growth, Monitoring developmental milestones
	4.3 Long-term Health Implications	Risk of chronic conditions, Importance of early intervention, Need for ongoing nutritional monitoring
	4.4 Success Stories and Positive Outcomes	Improvement in eating habits, Successful introduction of new foods, Enhanced family dynamics



# 3.1. Sensory Challenges in Eating

Texture Sensitivity: Children with SPD often show a strong aversion to certain food textures. Many prefer smooth textures and avoid crunchy foods or mixed textures. One parent noted, "My child refuses to eat anything that has a crunchy texture; he will only eat pureed foods."

Taste Sensitivity: Taste sensitivity is another significant challenge, with children exhibiting extreme pickiness and a preference for bland foods. Strong flavors are typically avoided. As one caregiver explained, "She will only eat plain pasta and bread. Anything with a strong taste is immediately rejected."

Smell Sensitivity: Smell sensitivity impacts food choices and the willingness to eat. Children often avoid foods with strong smells and prefer mild-smelling options. A parent shared, "The smell of cooked vegetables makes him gag. We have to keep meals very simple and neutral-smelling."

Visual Sensitivity: Visual sensitivity also plays a role in eating habits. Dislike of certain colors and a need for visually appealing food presentation can affect willingness to eat. One interviewee mentioned, "If the food doesn't look right to her, she won't even try it. It has to be presented just so."

Temperature Sensitivity: Children with SPD may have specific preferences for food temperatures, often avoiding foods that are too hot or too cold. As one parent said, "He will only eat food that is room temperature. Anything too hot or too cold is a big no."

## 3.2. Emotional and Behavioral Impacts

Anxiety and Stress: Mealtime can be a source of significant anxiety and stress for children with SPD, leading to a fear of trying new foods and stress around social eating situations. A caregiver reported, "Every meal is a battle. He gets so anxious and upset just seeing a new food on his plate."

Behavioral Responses: Behavioral responses such as food refusal and meltdowns during meals are common. Selective eating behaviors often lead to limited food intake. One parent observed, "She will cry and refuse to eat anything if it's not her favorite food. It's a daily struggle."

Social Implications: The social implications of SPDrelated eating issues can lead to isolation from peers and difficulty in social dining environments. Family meals can also be affected. A participant shared, "We can't go out to eat as a family because he gets too overwhelmed. It isolates us." Coping Mechanisms: To manage these challenges, children often develop coping mechanisms such as seeking comfort foods, sticking to familiar foods, and avoiding eating in unfamiliar settings. One interviewee stated, "He only feels safe eating certain foods and won't eat if we're at someone else's house."

# 3.3. Strategies for Managing Eating Habits

Parental Strategies: Parents implement various strategies, such as establishing food routines, gradually exposing children to new foods, and using positive reinforcement. One parent described, "We try to introduce new foods slowly, one bite at a time, and reward him when he tries something new."

Professional Interventions: Professional interventions, including occupational therapy, sensory integration therapy, and nutritional counseling, are essential in managing SPDrelated eating issues. A caregiver noted, "Therapy has helped us a lot. The occupational therapist works with him on tolerating different textures."

Environmental Modifications: Modifying the eating environment to create a calm setting, reducing sensory distractions, and using sensory-friendly utensils and plates can significantly help. One parent mentioned, "We dim the lights and use special plates to make mealtime more comfortable for her."

Adaptive Techniques: Adaptive techniques, such as introducing new foods in small amounts and combining preferred and non-preferred foods, are effective strategies. A caregiver explained, "We mix his favorite foods with new ones, so he's more likely to try them."

Peer and Social Support: Support from peers and social networks, including support groups for parents and educating friends and family about SPD, is crucial. As one participant stated, "Joining a support group has been invaluable. Sharing experiences with other parents helps a lot."

Educational Resources: Educational resources such as books, workshops, and online forums provide valuable information and support for managing SPD-related eating challenges. One parent highlighted, "We've learned so much from online resources and workshops. It really helps us understand how to support our child better."

## 3.4. Nutritional Outcomes

Nutritional Deficiencies: Children with SPD often face nutritional deficiencies due to limited intake of fruits and vegetables and a restricted variety of foods. A caregiver noted, "I'm always worried about her nutrition because she eats so few different foods."

Growth and Development Concerns: There are concerns about the impact of these eating habits on growth and development, including potential for stunted growth and monitoring developmental milestones. One parent mentioned, "We have to keep a close eye on his growth. He's not gaining weight like he should."

Long-term Health Implications: The long-term health implications of poor eating habits include risks of chronic conditions and the importance of early intervention and ongoing nutritional monitoring. A participant shared, "I'm worried about his future health. We try to stay proactive with his nutrition."

Success Stories and Positive Outcomes: Despite the challenges, there are success stories and positive outcomes, including improvements in eating habits, successful introduction of new foods, and enhanced family dynamics. One caregiver happily reported, "We've seen a lot of progress. He's trying more foods now, and mealtime is becoming more enjoyable for the whole family."

### 4. Discussion and Conclusion

The findings of this study illuminate the complex interplay of sensory challenges, emotional and behavioral impacts, and strategies for managing eating habits in children with Sensory Processing Disorders (SPD). Through semi-structured interviews, the study identified significant themes including texture sensitivity, taste sensitivity, smell sensitivity, visual sensitivity, and temperature sensitivity. Each of these sensory challenges directly impacts the eating habits and nutritional intake of children with SPD, leading to heightened food selectivity and potential nutritional deficiencies.

The sensory challenges faced by children with SPD, such as texture, taste, smell, visual, and temperature sensitivities, are consistent with findings from previous research. For instance, Cermak, Curtin, and Bandini (2010) highlighted that children with autism spectrum disorders (ASD), often comorbid with SPD, show heightened food selectivity due to sensory sensitivities (Cermak et al., 2010). The present study corroborates these findings, with parents reporting that their children exhibited strong aversions to specific food textures and tastes, leading to a restricted diet primarily consisting of bland and smooth-textured foods.

Furthermore, Engel-Yeger, Hardal-Nasser, and Gal (2015) found that sensory processing disorders are closely

linked to eating problems among children with intellectual developmental deficits (Engel-Yeger et al., 2015). The current study supports this by showing that children with SPD often avoid foods with strong smells and visually unappealing foods, resulting in a limited variety of acceptable foods. Such behaviors can contribute to nutritional deficiencies, as noted by Nadon et al. (2011), who emphasized the association between sensory processing issues and eating problems in children with autism (Nadon et al., 2011).

The emotional and behavioral impacts of SPD on eating habits, such as mealtime anxiety, food refusal, and social implications, were also prominent in the findings. This aligns with the work of Dovey, Kumari, and Blissett (2019), who reported that children with avoidant/restrictive food intake disorder (ARFID) and autism spectrum disorders exhibit significant behavioral problems related to eating, often due to sensory sensitivities (Dovey et al., 2019). These behavioral responses can lead to mealtime battles and stress for both the child and their caregivers, further complicating the management of nutritional intake.

Parents in the study described their children's use of coping mechanisms, such as seeking comfort foods and avoiding unfamiliar eating environments, to manage their sensory sensitivities. These behaviors are reflective of findings by Bell, Coulthard, and Wildbur (2017), who noted that anxiety and self-disgust in eating-disordered groups are associated with heightened sensory processing issues (Bell et al., 2017). The emotional distress caused by these sensory challenges can lead to social isolation and difficulties in social dining environments, as also highlighted by Stein et al. (1995; 2006) in their studies on the influence of parental eating disorders on children (Stein et al., 1995; Stein et al., 2006).

The study also explored various strategies employed by parents and professionals to manage the eating habits of children with SPD. Parental strategies included implementing food routines, gradual food exposure, and positive reinforcement, which have been shown to be effective in previous research. For instance, McIntosh, Kandiah, and Boucher (2019) emphasized the importance of practical considerations and tailored interventions by school nurses to improve the nutrition of children with autism spectrum disorders (McIntosh et al., 2019).

Professional interventions, such as occupational therapy and sensory integration therapy, were reported to be beneficial in the study. This is consistent with findings by Dumont et al. (2023), who highlighted the success of



behavior therapy in addressing feeding problems in children with SPD, though the effectiveness can vary based on individual sensory profiles (Dumont et al., 2023). Environmental modifications, adaptive techniques, and social support were also identified as crucial components in managing these eating challenges, aligning with the recommendations by Withrow and Alvidrez (2019) for addressing aberrant mealtime behaviors in children with autism spectrum disorder (Withrow & Alvidrez, 2019).

The study highlighted the nutritional deficiencies and growth concerns associated with restricted eating habits in children with SPD. These findings are supported by Nadon et al. (2011), who identified significant nutritional risks due to limited dietary variety and poor intake of essential nutrients in children with autism spectrum disorders (Nadon et al., 2011). The long-term health implications of such deficiencies underscore the importance of early intervention and ongoing nutritional monitoring, as emphasized by Saure et al. (2022) in their study on atypical sensory processing and eating disturbances in individuals with anorexia nervosa (Saure et al., 2022).

Despite these challenges, the study also reported success stories where children showed improvements in eating habits through consistent and tailored interventions. These positive outcomes highlight the potential for significant progress with appropriate support, aligning with the findings of Alibrandi (2023) on the effectiveness of targeted interventions in improving food selectivity in children with autism spectrum disorder (Alibrandi, 2023).

This study, while comprehensive in its qualitative approach, has several limitations. First, the sample size of 20 participants, though sufficient for reaching theoretical saturation, may not fully capture the diverse experiences of all children with SPD. The recruitment process, primarily through therapy centers and support groups, might have introduced a selection bias, limiting the generalizability of the findings. Additionally, the reliance on parental reports and observations may be subject to bias or inaccuracies, as parents might unintentionally emphasize certain behaviors or challenges over others. Lastly, the study focused solely on qualitative data from semi-structured interviews, which, while providing deep insights, do not allow for quantifiable measurements or broader statistical analyses.

Future research should aim to address these limitations by expanding the sample size and including participants from various socioeconomic and cultural backgrounds to enhance the generalizability of the findings. A mixed-methods approach, combining qualitative interviews with quantitative assessments, could provide a more comprehensive understanding of the nutritional challenges and eating habits in children with SPD. Longitudinal studies tracking the progress of children over time would also be valuable in understanding the long-term effects of sensory sensitivities on eating behaviors and nutritional outcomes. Additionally, exploring the impact of specific interventions in a controlled setting could help identify the most effective strategies for managing eating challenges in this population.

Practitioners working with children with SPD should adopt a holistic approach, considering the sensory, emotional, and behavioral aspects of eating. Personalized interventions, tailored to the child's specific sensory profile, are crucial for effective management. Incorporating sensory integration techniques and behavioral therapy can help address the underlying sensory sensitivities and improve eating habits. Collaboration with parents, educators, and healthcare professionals is essential to create a supportive environment that encourages healthy eating behaviors. Providing education and resources to families about SPD and its impact on eating can empower them to implement effective strategies at home. Additionally, creating sensoryfriendly eating environments and using adaptive tools can make mealtimes more comfortable and enjoyable for children with SPD, ultimately supporting better nutritional outcomes.

In conclusion, the study provides valuable insights into the complex challenges faced by children with Sensory Processing Disorders in relation to eating and nutrition. By understanding these challenges and implementing tailored interventions, practitioners and caregivers can support better nutritional outcomes and enhance the quality of life for these children and their families.

### Authors' Contributions

Authors contributed equally to this article.

### Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

#### **Transparency Statement**

Data are available for research purposes upon reasonable request to the corresponding author.

### Acknowledgments



We would like to express our gratitude to all individuals helped us to do the project.

### **Declaration of Interest**

The authors report no conflict of interest.

### Funding

According to the authors, this article has no financial support.

### **Ethics Considerations**

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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