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Title page**Dealing with Food Selectivity and Mealtime Behaviour in School-children with
Autism: A Qualitative Study of Special Education Teachers in Japan**

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Dealing with Food Selectivity and Mealtime Behaviour in School-children with Autism: A Qualitative Study of Special Education Teachers in Japan

Abstract

Food selectivity in children with autism spectrum disorder (ASD) is a serious issue in special needs schools, and special education teachers face various difficulties in their management of the problem. The aim of this study is to investigate the difficulties that special education teachers face in managing food selectivity in children with ASD. Data were obtained from 12 special education teachers in 2018 via semi-structured in-depth interviews. Thematic analysis was used to identify key conceptions of the participants' experiences, while qualitative analysis of the interview data revealed three major themes. Their personal and professional thoughts and hopes regarding eating habits in children, feelings of uncertainty about their practice, and their interactions with the children and their parents were the key factors behind the difficulties they experience as special education teachers. The findings improve our understanding of the challenges experienced by teachers managing food selectivity in children with ASD. A different conceptualisation of the problem may lead to difficulties in collaboration among the people who are tasked with solving the problem.

Keywords: autism spectrum disorder, children, feeding behaviour, school teachers, qualitative research

Background

Children with autism often manifest problematic mealtime behaviours (Schreck, Williams, and Smith 2004). Presentations of mealtime behaviour problems in children with autism spectrum disorders (ASD) include a preference for a limited amount of food, food refusal based on colour, texture, or brand, and rigid ritualistic rules and requests. Food selectivity is the most frequently reported issue in mealtime behaviour in children with ASD (Thullen and Bonsall 2017), which is related to disruptive mealtime behaviour (Curtin *et al.* 2015). A previous study on children with ASD defined food selectivity as food refusal, a limited food repertoire, and high-frequency single food intake (Bandini *et al.* 2010). As limited dietary variations can result in deficiencies that lead to poor nutrition, health risks, and gastrointestinal symptoms (Odar Stough *et al.* 2015). Food selectivity is a major concern for the parents of children with ASD (Tanoue, Takamasu, and Matsui 2017).

According to a recent review (Margari *et al.* 2020), the reported prevalence of eating problems, including food selectivity, is between 43–96%, which is much higher than they are in typically developing children. The prevalence of food selectivity also widely ranged from 9.8 to 83% in studies in the United States and European countries (Margari *et al.* 2020). Previous parental surveys in Japan also showed that 43–61% of pre-school children with ASD had food selectivity (Takahashi *et al.* 2017; Takahashi *et al.* 2012). Cumulative studies have observed several associated factors of food selectivity in children with ASD, including sensory, cognitive, behaviour rigidity, and environmental factors (Miyajima *et al.* 2014).

Sensory sensitivity is prevalent among children with ASD (Ben-Sasson *et al.* 2009; Nieto, Lopez, and Gandia 2017) and has been consistently associated with food refusal and a narrower variety of vegetable intake in children with ASD (Chistol *et al.* 2018; Tanner *et al.* 2015). Hyper- and hypo-responsiveness in visual, olfactory, and tactile senses has been shown to affect the subjective distress of individuals with ASD (Zhu and Dalby-Payne 2019). In addition, a study observed that repetitive and ritualistic behaviours as well as externalising and internalising behaviours are associated with mealtime behaviours (Johnson *et al.* 2014). However, in this study no association was found between cognitive function or social and communication impairment and mealtime behaviours (Johnson *et al.* 2014). These varied results suggest that food selectivity in children with ASD is a complex issue especially since several of its associated factors are also related to the characteristics of autism. Another study found that some aspects of food refusal (e.g. texture and food mixture) improved six years after the baseline evaluation but, follow-up observations in a small sample of children with ASD found no significant change in other aspects (e.g. temperature and colour) (Bandini *et al.* 2017).

One recent large-scale longitudinal study ($n = 396$) showed that eating problems in most children with ASD decrease over time, and fall below the clinical cut-off by school age (Peverill *et al.* 2019) however, 8.3% of these children maintained persistent and severe issues even at school age (Ashley *et al.* 2020).

Special education teachers are expected to instil good eating habits in children with ASD (Kurasawa *et al.* 2017). In addition, mealtime difficulties in children with ASD can also negatively affect other students in an educational setting (Koenig and Rudney 2010). These teachers have previously reported difficulties in doing so, but, their subjective experiences and the factors influencing these difficulties have not been well-investigated. A recent qualitative study examined the experiences of educators about mealtime behaviours of children with ASD in India (Padmanabhan and Shroff 2020). They reported their perspectives regarding reasons for disruptive behaviours in children, learning opportunities at mealtimes, and school policies. Although this study revealed an aspect of teachers' experiences, the difficulty in the management of food selectivity in ASD was not focused on in previous studies. Therefore, the subjective nature of the challenges faced by teachers requires further examination.

Mealtime behaviour issues in children with ASD is reported as one of the most common reasons for consultations between occupational therapist and teachers of special needs schools (Kurasawa *et al.* 2017). The need for intervention and treatment depends on the severity of the issues and children who struggle with moderate-to-severe food selectivity and generally require treatment and management both at home and school. Studies on such interventions in Japan (Miyajima *et al.* 2017; Yamane *et al.* 2020) are limited and primarily focused on preschoolers with ASD. This is because elementary or special needs schools in Japan have school lunches, and offering a customised special diet for every child is not feasible. In this situation managing mealtime behaviour issues are challenging for Japanese school teachers.

The research question of this study is: What factors affect the subjective difficulties of teachers in the management of food selectivity and mealtime behaviour? This study thus aims to examine the difficulty of school teachers in teaching children with ASD and food selectivity and to clarify the factors affecting their experiences.

Methods

Design

This study was a cross-sectional qualitative study based on face-to-face interviews, which

were conducted between August and November 2018. The study was carried out in accordance with the ethical standards set forth in the 1964 Declaration of Helsinki and its subsequent amendments. Written informed consent was obtained from all the participants. The protocol was approved by the Oita University Faculty of Education Research Ethics Committee (H30-006).

Participants

The study participants were teachers at special needs schools in Japan who had a history of teaching children with autism who also struggled with food selectivity. Special education teachers tend to understand essential characteristics of ASD and have experience managing food selectivity issues in children with ASD. Therefore, the criteria for the selection of participants in the study were as follows: (1) being teachers in special needs school and (2) having prior experience in the management of food selectivity in children with ASD. Participation in the study was voluntary.

Participants were recruited from four special needs schools in Oita, Japan, and twelve special education teachers participated in the study. A combination of purposeful and snowball sampling was used to capture the variation of the teachers' experience. A summary of the study participants is presented in Table 1. They have all worked with children with ASD aged six to twelve years. Based on the relatively narrow scope and research question of the study (i.e. investigating factors related to the difficulty in managing food selectivity issues), the distribution of the participants' characteristics (i.e. years of experience), and the recommendations of thematic analysis researchers (Clarke and Braun 2013), the sample size of the current study was estimated to be sufficient to identify key themes and components in teachers' experience.

[Insert Table 1 near here]

Interview

The authors used semi-structured face-to-face individual interviews in this study. In the interviews, we asked teachers about their difficulties in teaching children with food selectivity and autism, as well as their experiences in general. The authors audio-recorded the interviews on a digital IC recorder after receiving consent from the participants.

At the beginning of the interview, participants were asked to recall a particular child with food selectivity and ASD and to talk about the difficulties and challenges that they had experienced. Then, interviews were conducted using an interview guide, which included questions such as 'what was the most difficult problem you faced in your

management of food selectivity in children with ASD?’ and ‘what factors contributed to the difficulties you faced in achieving your goals with the children?’ Although the authors developed an interview guide, participants were encouraged to speak freely about their own views, ideas, and experiences of picky eating in children with ASD. The length of the interviews ranged from about 20 to 60 minutes. All interviews were conducted by the second author (YI) in Japanese.

Data analysis

The authors used thematic analysis to identify the themes and codes that make up the experience of special education teachers in managing the food selectivity of children with autism. The thematic analysis aims to explore patterns within the qualitative dataset, such as interview transcriptions (Braun and Clarke 2006; Clarke and Braun 2013). The interview transcripts were read several times so that we could familiarise ourselves with interview data. Before identifying themes from the data, we coded them to identify relevant aspects of the transcribed text based on our research question. We used inductive coding, which identifies codes during the analysis process without including any a priori codes. The transcribed text was first coded by the second author, which was later reviewed by the first author. We then discussed the codes and identified the themes in their experiences. The codes and original text were then reviewed and slightly modified to reflect the understandings to which we came. Through this iterative process, we finalised both the codes and themes. Data analysis was conducted in Japanese, and the excerpts were then translated into English by a professional translator. Translated materials were carefully reviewed by the authors to confirm that the meanings of the original were preserved verbatim.

The key assumptions are that teachers may be facing difficulties in managing food selectivity in children and that they have their own thoughts about healthy eating habits. The first author (HF) is a clinical psychologist with experience in providing psychological and educational support to children with disabilities, including ASD. The second author (YI) is a student attending a teacher training programme for special needs education who has experience managing food selectivity in ASD children. Both researchers are Japanese, with experience in the Japanese educational system and are actively involved in supporting children with special needs. The researchers’ characteristics may hinder the elicitation and clarification of the themes of the participants. The authors iteratively checked and discussed the interpretation of the themes and differences between previous and current findings to resolve the issues.

Results

We identified three major themes related to individual thoughts, conflicts between personal beliefs and the circumstances, and interactions. A summary of the themes and codes identified is shown in Table 2.

[Insert Table 2 near here]

Personal and professional thoughts and hopes

The theme included five codes with regards to the teachers' hopes for the eating habits of children with ASD and food selectivity, their thoughts on improving the diet of the children, and their thoughts on giving guidance to the children.

Personal hopes regarding eating habits

Teachers had personal hopes for the children's health, their eating habits, and their future lives. This code represents their personal perspectives regarding their eating habits.

'If they [children with ASD] learn to eat a variety of foods, their diet will expand, which will bring about a lot of health benefits. Most importantly, their expanded diet will prove beneficial in the future [as they will eat a variety of foods]. If they can only eat a certain type of food, it will not be fun. I think it would be good if we could broaden their diet a little while they are still young'. (P3, 10–19 years of experience)

'I love eating and cooking, and I want the children in my class to feel that eating is fun. I want them to broaden their experience by learning that certain foods taste in certain ways and by discovering new foods, instead of thinking that eating is a nuisance'. (P12, 10–19 years of experience)

Meanwhile, P6 was of the view that even if children exhibit somewhat problematic behaviour during school lunches, what is important is that they enjoy eating.

'If a child eats with gusto, enjoys eating, and has a good time, that would be good, even if his or her etiquette might need improvement. I think it is important [to view children's behaviour in such a light]'. (P6, less than 10 years of experience)

The necessity of giving professional guidance against food selectivity

P2 explained the importance of expanding the range of food that the children can eat in light of the natural disasters and other incidents that have been on the rise in recent years.

‘I think [more balanced eating] would make their life easier. I think it would be better if they could eat various kinds of foods. When a natural disaster occurs, there is no guarantee that they will be able to eat only what they want’. (P2, 10–19 years of experience)

P8 also emphasised the importance of providing guidance against picky eating because, in the future, children may not always be able to have exactly the same food that they currently eat, and it may not taste the same either.

‘If they eat a certain type of food only, [that would be problematic because] their favourite food will not be available all the time. When they go on a school trip or go out into the world, or when their guardians are no longer with them, they will not have food that tastes exactly the same. I think it is important for children to try different foods, even just a little, and to know that there are many different tastes’. (P8, less than 10 years of experience)

On the other hand, P9 thought that it was not necessary to force children to eat, although she thought that the experience of eating is important in their life.

‘It is okay if you do not like something. But it is hard not to be able to eat something. Even adults have their likes and dislikes. Yet, I do not want the children to live their life without experiencing anything different. So, I tell them to first try different things. But I do not think that [autism] is the only reason why they cannot eat... I think there are many reasons. So, they do not have to force themselves’. (P9, 20 or more years of experience)

Rapport with children

Some teachers valued rapport and made efforts to strengthen the trust children had in their teachers. One teacher explained that strengthening relationships with children greatly impacted the provision of guidance against picky eating.

‘The relationship [between a teacher and their students] is also important... I was

making various efforts overall... I think the trusting relationship was a very important factor... The main pillar of this policy was to use that trust to encourage children to take a small step and to move up a few steps, give them a sense of accomplishment, and make them want to try again the next day'. (P1, 10–19 years of experience)

Taking a long-term view

The development of children with ASD is gradual, and it can take a long time to change their behaviours. P6 teacher emphasised the importance of considering the children's growth from a long-term perspective.

'I think it is gratifying and enjoyable to be able to eat more things, eventually. But he is still in the first grade. So, it would be nice if he could start eating more things and try different things little by little. I think he would be happier that way'. (P6, less than 10 years of experience)

P5 said that she valued the fact that the children are growing, even if only by a little, from a long-term perspective.

'I think it is good if they have grown in various respects, compared with the beginning of the school term. If there is even a slight change, compared to when they first started, that would be good'. (P5, 20 or more years of experience)

Uncertainty of their practice

The theme 'Uncertainty of their practice' summarises the inner conflicts experienced by teachers and the challenges faced by them when giving guidance to children with ASD and picky eating habits.

Feeling unsure about the appropriateness of their practice

Because the problems and severity of food selectivity in children with ASD are diverse, teachers are required to evaluate various factors affecting their problems. Although various approaches to improve selectivity are tried, they do not always work out. Therefore, teachers sometimes felt unsure of the appropriateness of their approach in dealing with food selectivity in children with ASD.

'It was my own subjective view, but I wondered whether one certain thing would

really work. I wondered if the approach was okay...I had some doubts about demanding that children eat certain things in the name of guidance. I had doubts about the management approach to correct children's picky eating'. (P2, 10–19 years of experience)

Some teachers also felt exhausted and unappreciated for their efforts in dealing with the individual needs of the children.

'For children who are sensitive, I separated the food [in school lunches] according to texture. It was difficult to separate the food, but the children still would not eat it...' (P7, 20 or more years of experience)

Interactions and sharing conceptualisations

This theme summarised the difficulties related to interactions and sharing conceptualisations of food selectivity and eating behaviour problems with family and other teachers.

Difficulties in interactions with children

Some participants described the difficulty of communicating with non-verbal children and managing their food selectivity issues. Some had trouble understanding the cause of the child's behaviour during school lunch (e.g. whether feeling uncomfortable, frustrated, or angry).

'What was difficult was that the child [because of severe intellectual disabilities] took a long time to understand that, after eating something, there would be something else to eat. I had to explain this to the child repeatedly. Of course, I said it using words and supporting tools, but it was difficult for the child to understand it'. (P4, 20 or more years of experience)

'In my interaction with a certain child, even a small word or gesture could make the child feel uncomfortable [at mealtimes]. This is probably why the child turned against food in frustration. This was due to the way I gave guidance, the way I spoke, and the way I interacted with the child. I looked at the child's face and wondered what approach to use in order to calm the child down. It was difficult to find out what caused the child to do that [turn against food and throw away his lunch]'. (P6, less than 10 years of experience)

Difficulties in working with families

Participants explained that it was sometimes difficult to ask for cooperation from the child's parents regarding food selectivity, considering the family environment and the circumstances of the parents.

'I dealt with a mother who was really struggling. I could perhaps have told her, "We follow such a method at school, so please do such and such at home." However, the mother could not really handle how the child acted. Even if the child cried at home, the mother would not tell us that. There were some things that I did not feel comfortable saying. So, I did not say those things strongly. I once told her, "Your child began to eat," and "Your child is doing such and such." But it was difficult to say, "Please also do this at home."' (P3, 10–19 years of experience)

'A certain parent with whom I dealt was very stubborn, and asked me not to provide guidance or intervention regarding picky eating because this parent was worried that the child [who had once refused to attend school] may refuse to attend school again [if the child received intervention for food selectivity]'. (P1, 10–19 years of experience)

Additionally, participants felt that the difficulty was compounded by their relationship with the parents and the characteristics of the children, in that ambivalence may develop to prevent the relationship from deteriorating.

'I did not have a very good connection [with the parents]. So, I did not tell them much about the creative attempts I made to encourage children to eat. If I did, they would overreact and say, "My child does not eat? Why not?" [expressed aggressively]. So, the other teachers and I tried not to tell them too many things like that'. (P8, less than 10 years of experience)

Difficulties in working with other teachers

Participants also had difficulty working with other teachers when there was a difference in teachers' views and approach about picky eating. In addition, there were sometimes difficulties in communicating concrete plans regarding how support would be provided by teachers.

‘Each of us has our own ideas about how to give guidance regarding picky eating. So, if we did something in the previous year, and then we do something completely different in the following year, the children may feel disoriented. In the guidance plan, we try to retain certain aspects in the following year. However, sometimes we cannot communicate the details well enough, and each teacher has a slightly different way of thinking’. (P10, 20 or more years of experience)

‘I disagree with the way in which another teacher who teaches the same class forces the children to eat food. I think there is no need to force children to eat if they are crying. However, it is difficult to communicate my thinking effectively’. (P5, 20 or more years of experience)

In addition, it was also challenging to hand over to another teacher their own method of guidance, because each teacher had a different view.

‘When the homeroom teacher changes, the way of thinking and the teaching methods also change. It would be best if I could pass on the knowledge I have accumulated over the past year, but sometimes things change 180 degrees. This is a challenge’. (P11, less than 10 years of experience)

Discussion

This study examined the factors that influence the difficulties that special education teachers face during school mealtime, in the management of children with food selectivity and ASD. We identified three major themes related to the difficulties of teachers: their personal and professional thoughts and hopes regarding eating habits in children, their uncertainty about their practice, and the interactions between teachers, children, and parents. A previous study in India examined the mealtime experience of educators with children with ASD and identified themes, such as disruptive behaviours in mealtime, mealtime as learning opportunities, strategies by educators and school policies (i.e., gluten free-casein free diet) (Padmanabhan and Shroff 2020). Because our study focused on difficulties experienced by special education teachers, our identified themes predominantly focused on difficulties.

The theme ‘personal and professional thoughts and hopes’ includes the personal hopes of special education teachers for their children, their professional view about food selectivity, the value of rapport with children, and taking a long-term perspective on child

development. Participants in this study had various thoughts about the importance of eating habits in daily life. Discrepancies or conflicts between personal and professional views of the practitioners can lead to difficulties in managing picky eating habits or food refusal of children during school lunch. Teachers' attempts to make children eat may cause crying, spitting out the food, aggressive behaviour, self-injury, and severe tantrums (Allen *et al.* 2015; Lukens and Linscheid 2008), which leads to a conflict between teachers' own beliefs about the importance of rapport and long-term development. Such behaviour can cause anxiety in a teacher, which is related to the second theme identified in this study.

The theme 'uncertainty about their practice' includes one component that describes uncertainty about food selectivity management in children with ASD. They wondered if their practice was 'really work'. Currently, there are no established treatments or interventions that have been proven effective in school settings. Galpin *et al.* examined a sensory-based intervention provided by the teaching staff in a school setting (Galpin, Osman, and Paramore 2018). They developed a class-based quasi-experimental intervention in a school ('Sensory Snack Time') for children with autism and severe learning difficulties. The results showed a significant decrease in food selectivity, food refusal, and disruptive mealtime behaviour after the intervention. Such school-delivered intervention may be a promising option to improve food selectivity and mealtime behaviour of children with ASD in school settings. Developing a school system that promotes such interventions can lead to an increase in teachers' efficacy and feelings of adequacy in their practice.

The theme 'interactions and sharing conceptualisation' includes difficulties in working with children, families, and other teachers. Usually, family and teachers are potential resources for supporting the development of children. Although communication between school teachers and parents is generally respectful, this is not always true in all situations (Syriopoulou-Delli and Polychronopoulou 2019). The most prominent factor that affected the teachers was the difference or discrepancy in the conceptualisation of the eating problems and required support for children between school and family. These differences may also cause teachers to experience difficulties collaborating with the people involved, which may also lead them to question the adequacy of their approaches. Such difficulties may also occur due to the cultural characteristics of relationships in Japan. Japanese parents value empathy in their relationships with professionals, which is different from other countries. Such a relationships may interfere with open communication with parents (Kayama 2010). The parents' anxiety may prevent the teacher from taking any action. Some parents feel anxious about intervention for food

selectivity because it may worsen children's disruptive behaviours, as described by the participants in the interview. In addition, a substantial proportion of the parents of children with ASD have anxiety disorders and other mental health problems (Schnabel *et al.* 2020). Such a family environment may hinder school teachers from sharing the difficulties of children and asking parents to implement mealtime support at home. Severe eating problems are related to more disruptive behaviours in children over time (Peverill *et al.* 2019). A combination of these issues may worsen the difficulties in the management of food selectivity issues.

There are intervention programmes that are being developed for food selectivity in ASD, which are effective and feasible in the preliminary stages (Johnson *et al.* 2019; Miyajima *et al.* 2017; Sharp *et al.* 2019). Accumulation of research evidence may help both teachers and families better understand the issues of ASD and learn the required skills to manage food selectivity and disruptive mealtime behaviours in children. Bridging the conceptual gap about food selectivity between special education teachers and parents is an essential part of solving communication problems.

A previous study on Japanese educators identified the lack of training and collaboration between staff members as one of the challenges (Kayama *et al.* 2015). Schools should consider allocating resources to train teachers in effective intervention programs and use such programs to develop cooperative relationships. Difficulties among teachers to work together may also be related to the fact that their strategies are based on different ideas and hopes, as mentioned under the first theme. As teachers are not necessarily professionals in eating-behaviour issues, establishing a multidisciplinary team that includes a dietician, occupational therapist, speech therapist, and psychologist would be helpful in developing individualised treatment plans for students in both school and home (Zhu and Dalby-Payne 2019).

The findings of this study are relevant to special education teachers and other stakeholders involved in supporting children with ASD. The participants of this study were teachers from special needs schools with extensive experience in teaching children with ASD. Even with such expertise, they were found to be difficult to deal with. The findings of this study articulate their struggles and requirements. Teacher support and education programs are immediate requirements to address challenges in identifying and implementing effective practices (Brock *et al.* 2019; Corona, Christodulu, and Rinaldi 2016; Hsiao and Sorensen Petersen 2018). Acquiring knowledge about current evidence-based practices and their implementation would be helpful for special education teachers (Brock *et al.* 2014; Catalano *et al.* 2020) because the teachers may feel uncertain in their approach. Furthermore, teacher self-efficacy is essential in engaging educational goal

attainment of students with ASD (Love *et al.* 2020), affecting perceptions of the issue and interaction with students. We believe these components will support educators' positive engagements with their students.

Several limitations of this study should be considered. First, the generalisability of our findings would be affected by differences in cultures and educational environments. The experience, training and potential resources available for the teachers would depend on their educational environment. Although major themes would be similar across cultures, attitudes and the culture of school teachers may affect the findings (Kayama 2015). Second, the participants of this study were limited to special education teachers only. Teachers in elementary schools may have a different experience, because the mealtime environment is different from that of special education schools. Individual attitudes related to ASD may also affect the perception of difficulties and personal views regarding eating habits. Third, the participants in this study had experience dealing with children with autism, most of whom were post-school age. The factors that affect the difficulties experienced by special education teachers in the early educational stage may be different, since the problems might manifest to a greater extent in preschool children. To improve collaboration between special education teachers and parents, constant meetings and availability of other professionals (e.g. school psychologist, occupational therapist and speech pathologist) may help them work together (Syriopoulou-Delli and Polychronopoulou 2019), which was not investigated in this study. Fourth, the contributing factors may differ in challenging cases where the problems persist into adolescence.

In conclusion, the findings of this study suggest three major factors affecting the difficulties of special education teachers in the management of food selectivity and disruptive mealtime behaviour in children with ASD. These factors are mostly personal and interactive in nature. Developing collaborative relationships via ongoing meetings with other professionals such as school psychologists and speech pathologists, as well as better communication of individual wishes, may improve teachers' experiences in managing eating behaviour issues associated with ASD.

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Ethical approval

This study was carried out in accordance with the ethical standards set forth in the 1964 Declaration of Helsinki and its later amendments, with written informed consent from the participants. The protocol was approved by the Oita University Faculty of Education Research Ethics Committee (H30-006).

Consent to participate and publish

Informed consent was obtained from all individual participants included in the study. Identifying information included in the interview transcripts was removed from the manuscript.

Author's contributions

HF: Conceptualization, Methodology, Formal analysis, Writing - Original Draft, Writing - Review & Editing.

YI: Conceptualization, Investigation, Formal analysis, Writing - Original Draft preparation, Writing - Review & Editing.

All authors read and approved the final manuscript.

Conflict of interest

The authors declare that they have no competing interests.

References

- Allen, S. L., Smith, I. M., Duku, E., Vaillancourt, T., Szatmari, P., Bryson, S., Fombonne, E., Volden, J., Waddell, C., Zwaigenbaum, L., Roberts, W., Mirenda, P., Bennett, T., Elsabbagh, M., and Georgiades, S. 2015. Behavioral Pediatrics Feeding Assessment Scale in Young Children With Autism Spectrum Disorder: Psychometrics and Associations With Child and Parent Variables. *Journal of Pediatric Psychology*, 40, 581-590. doi: 10.1093/jpepsy/jsv006.
- Ashley, K., Steinfeld, M. B., Young, G. S., and Ozonoff, S. 2020. Onset, Trajectory, and Pattern of Feeding Difficulties in Toddlers Later Diagnosed with Autism. *Journal of Developmental and Behavioral Pediatrics*, 41, 165-171. doi: 10.1097/DBP.0000000000000757.
- Bandini, L. G., Anderson, S. E., Curtin, C., Cermak, S., Evans, E. W., Scampini, R., Maslin, M., and Must, A. 2010. Food selectivity in children with autism spectrum disorders and typically developing children. *Journal of Pediatrics*, 157, 259-264. doi: 10.1016/j.jpeds.2010.02.013.
- Bandini, L. G., Curtin, C., Phillips, S., Anderson, S. E., Maslin, M., and Must, A. 2017. Changes in Food Selectivity in Children with Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*, 47, 439-446. doi: 10.1007/s10803-016-2963-6.
- Ben-Sasson, A., Hen, L., Fluss, R., Cermak, S. A., Engel-Yeger, B., and Gal, E. 2009. A meta-analysis of sensory modulation symptoms in individuals with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 39, 1-11. doi: 10.1007/s10803-008-0593-3.
- Braun, V., and Clarke, V. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77-101. doi: 10.1191/1478088706qp063oa.
- Brock, M. E., Dynia, J. M., Dueker, S. A., and Barczak, M. A. 2019. Teacher-Reported Priorities and Practices for Students With Autism: Characterizing the Research-to-Practice Gap. *Focus on Autism and Other Developmental Disabilities*, 35, 67-78. doi: 10.1177/1088357619881217.
- Brock, M. E., Huber, H. B., Carter, E. W., Juarez, A. P., and Warren, Z. E. 2014. Statewide Assessment of Professional Development Needs Related to Educating Students With Autism Spectrum Disorder. *Focus on Autism and Other Developmental Disabilities*, 29, 67-79. doi: 10.1177/1088357614522290.
- Catalano, C. G., Fives, H., McKeating, E., and Barnes, N. 2020. Preservice early childhood teachers' sense of efficacy for teaching children with autism spectrum disorder. *Journal of Early Childhood Teacher Education*, 1-27. doi:

- 10.1080/10901027.2020.1806152.
- Chistol, L. T., Bandini, L. G., Must, A., Phillips, S., Cermak, S. A., and Curtin, C. 2018. Sensory Sensitivity and Food Selectivity in Children with Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*, 48, 583-591. doi: 10.1007/s10803-017-3340-9.
- Clarke, V., and Braun, V. 2013. *Successful Qualitative Research: A Practical Guide for Beginners*. London: Sage Publications.
- Corona, L. L., Christodulu, K. V., and Rinaldi, M. L. 2016. Investigation of School Professionals' Self-Efficacy for Working With Students With ASD. *Journal of Positive Behavior Interventions*, 19, 90-101. doi: 10.1177/1098300716667604.
- Curtin, C., Hubbard, K., Anderson, S. E., Mick, E., Must, A., and Bandini, L. G. 2015. Food selectivity, mealtime behavior problems, spousal stress, and family food choices in children with and without autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 45, 3308-3315. doi: 10.1007/s10803-015-2490-x.
- Galpin, J., Osman, L., and Paramore, C. 2018. Sensory Snack Time: A School-Based Intervention Addressing Food Selectivity in Autistic Children. *Frontiers in Education*, 3. doi: 10.3389/educ.2018.00077.
- Hsiao, Y.-J., and Sorensen Petersen, S. 2018. Evidence-Based Practices Provided in Teacher Education and In-Service Training Programs for Special Education Teachers of Students With Autism Spectrum Disorders. *Teacher Education and Special Education: The Journal of the Teacher Education Division of the Council for Exceptional Children*, 42, 193-208. doi: 10.1177/0888406418758464.
- Johnson, C. R., Brown, K., Hyman, S. L., Brooks, M. M., Aponte, C., Levato, L., Schmidt, B., Evans, V., Huo, Z., Bendixen, R., Eng, H., Sax, T., and Smith, T. 2019. Parent Training for Feeding Problems in Children With Autism Spectrum Disorder: Initial Randomized Trial. *Journal of Pediatric Psychology*, 44, 164-175. doi: 10.1093/jpepsy/isy063.
- Johnson, C. R., Turner, K., Stewart, P. A., Schmidt, B., Shui, A., Macklin, E., Reynolds, A., James, J., Johnson, S. L., Manning Courtney, P., and Hyman, S. L. 2014. Relationships between feeding problems, behavioral characteristics and nutritional quality in children with ASD. *Journal of Autism and Developmental Disorders*, 44, 2175-2184. doi: 10.1007/s10803-014-2095-9.
- Koenig, K. P., and Rudney, S. G. 2010. Performance challenges for children and adolescents with difficulty processing and integrating sensory information: a systematic review. *American Journal of Occupational Therapy*, 64, 430-442. doi: 10.5014/ajot.2010.09073.

- Kurasawa, S., Tateyama, K., Tanba, H., Asai, I., Shimazu, M., Tamura, Y., and Ohtoshi, T. 2017. Consultations with occupational therapists for children with autism spectrum disorder in a special-needs school and collaboration between special support education coordinator and an occupational therapist. *LD Kenkyu [Japanese Journal of Learning Disabilities]*, 26, 270-283.
- Love, A. M. A., Findley, J. A., Ruble, L. A., and McGrew, J. H. 2020. Teacher Self-Efficacy for Teaching Students With Autism Spectrum Disorder: Associations with Stress, Teacher Engagement, and Student IEP Outcomes Following COMPASS Consultation. *Focus on Autism and Other Developmental Disabilities*, 35, 47-54. doi: 10.1177/1088357619836767.
- Lukens, C. T., and Linscheid, T. R. 2008. Development and validation of an inventory to assess mealtime behavior problems in children with autism. *Journal of Autism and Developmental Disorders*, 38, 342-352. doi: 10.1007/s10803-007-0401-5.
- Margari, L., Marzulli, L., Gabellone, A., and de Giambattista, C. 2020. Eating and Mealtime Behaviors in Patients with Autism Spectrum Disorder: Current Perspectives. *Neuropsychiatric Disease and Treatment*, 16, 2083-2102. doi: 10.2147/NDT.S224779.
- Miyajima, A., Tateyama, K., Fuji, S., Nakaoka, K., Hirao, K., and Higaki, K. 2017. Development of an Intervention Programme for Selective Eating in Children with Autism Spectrum Disorder. *Hong Kong J Occup Ther*, 30, 22-32. doi: 10.1016/j.hkjot.2017.10.001.
- Miyajima, A., Tateyama, K., Yano, H., Hirao, K., and Higaki, K. 2014. An exploratory study on the factors of food preferences and approaches for selective eating in children with autism spectrum disorder. *Sagyo Ryoho [Occupational Therapy]*, 33, 124-136.
- Nieto, C., Lopez, B., and Gandia, H. 2017. Relationships between atypical sensory processing patterns, maladaptive behaviour and maternal stress in Spanish children with autism spectrum disorder. *Journal of Intellectual Disability Research*, 61, 1140-1150. doi: 10.1111/jir.12435.
- Odar Stough, C., Dreyer Gillette, M. L., Roberts, M. C., Jorgensen, T. D., and Patton, S. R. 2015. Mealtime behaviors associated with consumption of unfamiliar foods by young children with autism spectrum disorder. *Appetite*, 95, 324-333. doi: 10.1016/j.appet.2015.07.019.
- Padmanabhan, P. S., and Shroff, H. 2020. Addressing mealtime behaviours of children with autism spectrum disorders in schools: a qualitative study with educators in Mumbai, India. *International Journal of Developmental Disabilities*, 1-9. doi:

- 10.1080/20473869.2020.1738794.
- Peeverill, S., Smith, I. M., Duku, E., Szatmari, P., Mirenda, P., Vaillancourt, T., Volden, J., Zwaigenbaum, L., Bennett, T., Elsabbagh, M., Georgiades, S., and Ungar, W. J. 2019. Developmental Trajectories of Feeding Problems in Children with Autism Spectrum Disorder. *Journal of Pediatric Psychology*, 44, 988-998. doi: 10.1093/jpepsy/jsz033.
- Schreck, K. A., Williams, K., and Smith, A. F. 2004. A comparison of eating behaviors between children with and without autism. *Journal of Autism and Developmental Disorders*, 34, 433-438. doi: 10.1023/b:jadd.0000037419.78531.86.
- Sharp, W. G., Burrell, T. L., Berry, R. C., Stubbs, K. H., McCracken, C. E., Gillespie, S. E., and Scahill, L. 2019. The Autism Managing Eating Aversions and Limited Variety Plan vs Parent Education: A Randomized Clinical Trial. *Journal of Pediatrics*, 211, 185-192 e181. doi: 10.1016/j.jpeds.2019.03.046.
- Syriopoulou-Delli, C. K., and Polychronopoulou, S. A. 2019. Organization and management of the ways in which teachers and parents with children with ASD communicate and collaborate with each other. *Int J Dev Disabil*, 65, 31-48. doi: 10.1080/20473869.2017.1359355.
- Takahashi, M., Takahashi, M., Hironaka, S., Utumi, A., and Ooka, T. 2017. Dietary Issues in Toddlers and Preschool Children Comparisons between Neurotypical Children Those with Autism Spectrum. *[Japanese Journal of Pediatric Dentistry]*, 55, 11-17. doi: 10.11411/jspd.55.1_11.
- Takahashi, M., Utumi, A., Ooka, T., and Mukai, Y. 2012. Study of problems about diets of children with autistic spectrum disorder: The second report: study of actual conditions of unbalanced diets and factors relating to them. *[Japanese Journal of Dysphagia Rehabilitation]*, 16, 175-181. doi: 10.32136/jsdr.16.2_175.
- Tanner, K., Case-Smith, J., Nahikian-Nelms, M., Ratliff-Schaub, K., Spees, C., and Darragh, A. R. 2015. Behavioral and Physiological Factors Associated With Selective Eating in Children With Autism Spectrum Disorder. *American Journal of Occupational Therapy*, 69, 6906180030p6906180031-6906180038. doi: 10.5014/ajot.2015.019273.
- Tanoue, K., Takamasu, T., and Matsui, K. 2017. Food repertoire history in children with autism spectrum disorder in Japan. *Pediatrics International*, 59, 342-346. doi: 10.1111/ped.13160.
- Thullen, M., and Bonsall, A. 2017. Co-Parenting Quality, Parenting Stress, and Feeding Challenges in Families with a Child Diagnosed with Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*, 47, 878-886. doi:

10.1007/s10803-016-2988-x.

Zhu, V., and Dalby-Payne, J. 2019. Feeding difficulties in children with autism spectrum disorder: Aetiology, health impacts and psychotherapeutic interventions. *Journal of Paediatrics and Child Health*, 55, 1304-1308. doi: 10.1111/jpc.14638.

Table 1. Characteristics of the participants of this study

Participant	Gender	Age	Experience in school
P1	Woman	32	10–19 years
P2	Woman	38	10–19 years
P3	Man	40	10–19 years
P4	Woman	51	≥ 20 years
P5	Woman	52	≥ 20 years
P6	Woman	43	<10 years
P7	Woman	54	≥ 20 years
P8	Man	29	<10 years
P9	Woman	58	≥ 20 years
P10	Woman	48	≥ 20 years
P11	Man	28	<10 years
P12	Woman	37	10–19 years

Table 2. Summary of the themes codes, and their descriptions

Theme	Codes	Description
Personal and professional thoughts and hopes	Personal hopes regarding eating habits	Teachers' personal practices to make children enjoy school lunches and their hope that this would improve the child's eating habits and health.
	The necessity of giving professional guidance against food selectivity	Beliefs concerning the necessity of professional guidance on food selectivity in children with ASD. Includes belief that good eating habits are necessary for children, and beliefs that such guidance is not necessary.
	Rapport with children	Valuing rapport and making efforts to strengthen trust with children. Includes beliefs that developing a trusting relationship is necessary for providing guidance to children.
	Taking a long-term view	Belief that it is necessary to take a long-term view because development and progress in children occur in stages.
Uncertainty of their practice	Feeling unsure about the appropriateness of their practice	Teacher's unsure feelings about their ideas and intervention practices for special conditions and difficulties in individual children.
Interactions and sharing conceptualisations	Difficulties in interactions with children	Challenges experienced by teachers when communicating with children with nonverbal difficulties.
	Difficulties in working with families	Challenges in asking for parents' cooperation about food selectivity and mealtime behaviours when parents themselves are facing hardships.
	Difficulties in working with other teachers	Conflicts that the special education teachers have among themselves due to a lack of agreement on support plans for individual children.