



# Heard and Seen: Developing Inclusive Activities for Enabling the Voices of Children with Disabilities in Oral Health Research

**Document Version**  
Final published version

[Link to publication record in Manchester Research Explorer](#)

**Citation for published version (APA):**

Al Wadi, M., Al Jameel, A., Baker, S. R., & Owens, J. (2024). Heard and Seen: Developing Inclusive Activities for Enabling the Voices of Children with Disabilities in Oral Health Research. *Journal of Disability Research*, 3(e20240016), 1-10. Article e20240016.

**Published in:**  
Journal of Disability Research

**Citing this paper**

Please note that where the full-text provided on Manchester Research Explorer is the Author Accepted Manuscript or Proof version this may differ from the final Published version. If citing, it is advised that you check and use the publisher's definitive version.

**General rights**

Copyright and moral rights for the publications made accessible in the Research Explorer are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

**Takedown policy**

If you believe that this document breaches copyright please refer to the University of Manchester's Takedown Procedures [<http://man.ac.uk/04Y6Bo>] or contact [uml.scholarlycommunications@manchester.ac.uk](mailto:uml.scholarlycommunications@manchester.ac.uk) providing relevant details, so we can investigate your claim.





## Heard and Seen: Developing Inclusive Activities for Enabling the Voices of Children with Disabilities in Oral Health Research

Maram Alwadi<sup>1,2,\*</sup>, AlBandary AlJameel<sup>2,3</sup>, Sarah Baker<sup>2,4</sup> and Janine Owens<sup>2,5</sup>

<sup>1</sup>Department of Dental Health, College of Applied Medical Sciences, King Saud University, Riyadh, Saudi Arabia<sup>✉</sup>

<sup>2</sup>King Salman Center for Disability Research, Riyadh, Saudi Arabia<sup>✉</sup>

<sup>3</sup>Department of Periodontics & Community Dentistry, College of Dentistry, King Saud University, Riyadh, Saudi Arabia<sup>✉</sup>

<sup>4</sup>Academic Unit of Oral Health, Dentistry and Society, School of Clinical Dentistry, University of Sheffield, Sheffield, UK<sup>✉</sup>

<sup>5</sup>NIHR Applied Research Collaborative Greater Manchester (NIHR ARC GM), University of Manchester, Manchester, UK<sup>✉</sup>

Correspondence to:

Maram Alwadi\*, e-mail: [malwadi@ksu.edu.sa](mailto:malwadi@ksu.edu.sa), Tel.: +(966) 11 467 7580

Received: December 31 2023; Revised: February 5 2024; Accepted: February 5 2024; Published Online: March 2 2024

### ABSTRACT

The Convention on the Rights of the Child argues for children's involvement in research. Oral health research frequently excludes children with disabilities and their voices. This study takes a rights-based approach by devising methods to include disabled children in oral health research. This is an ethnographic study. Methods utilized interviews, guided tours, symbols, drawings, pictures, and games. The selection of method depended on the ability and preference of each child. Using pictures and games as prompts enabled child participation. The guided tour activity facilitated the development of relationships with the children. It also increased their ability to chat informally and appeared to reduce power imbalances compared to formal, structured interviewing. Focus group interviews, symbols, and drawings acted as barriers to children's participation. Involving children with disabilities in oral health research requires using appropriate methodological designs and innovative, pluralistic methods drawn from different disciplines. This promotes a rights-based approach, which recognizes diversity and aims to reduce the discrimination and disempowerment of children with disabilities.

### KEYWORDS

disabled children, inclusion, oral health, research methods, research with children

## INTRODUCTION

Children have historically been marginalized as valid and competent research participants, often viewed as passive recipients lacking the capabilities of adults. They were conceptualized as “not-yet-being” (Verhellen, 2000, p.16), or “adults in waiting” (Matthews and Limb, 1998, p.67), leading to their exclusion from meaningful research engagement (Such and Walker, 2005). However, the sociology of childhood highlights the need to understand children as social actors who are capable of expressing their own experiences and who have a fundamental right to be heard (James et al., 1998). Policy and legislation facilitate this significant shift in thinking by aiming to support the rights of children in all matters that affect them (Roulstone and McLeod, 2011).

The United Nations Convention on the Rights of the Child (UNCRC), established in 1989, has played a significant role in reshaping the perceptions of children's participation in

research (UNICEF, 1989). Article 12 of the UNCRC asserts children's right to express their views and have them taken seriously in all matters affecting them, including health research (UNICEF, 1989). Similarly, the United Nations Convention on the Rights of Persons with Disabilities emphasizes the rights and dignity of children with disabilities, affirming their right to freely express their views, taking into account their age and maturity (UNCRPD, 2006).

In the context of disability, research on childhood and disability has historically relied on adult perspectives rather than the views of children with disabilities themselves (Stalker and Connors, 2003), or it has focused on verbally articulate children (Fabbretti et al., 1997). However, there has been an increasing number of social researchers who use qualitative research methods, often seeking to include the voices of individuals with disabilities in research informing policy

and service provision (Minkes et al., 1994; Ash et al., 1997; Connors, 2003; Morris, 2003; Davis et al., 2012). An example is educational research, which explores diverse methods such as observations, interviews, and the integration of visual aids such as photographs and pictures to facilitate interviews, alongside the mosaic approach—a comprehensive method that combines various techniques—to understand children’s experiences (Marchant et al., 2001; Punch, 2002; Morris, 2003; Einarsdottir, 2005; Clark and Moss, 2011). Researchers argue that excluding the voices of children with disabilities is unacceptable and emphasize the responsibility of academics to consider diversity more strongly in research. They advocate for inclusive methods that enable children with disabilities to become active participants, ensuring that their perspectives are heard and valued (Minkes et al., 1994; Ash et al., 1997; Connors, 2003; Morris, 2003; Davis et al., 2012). This methodological shift is grounded in the sociology of childhood, which recognizes children as competent social actors (James et al., 1998), and the social model of disability, which highlights societal barriers, which hinder the participation of individuals with disabilities (Oliver, 2018).

While progress has been made in social and educational research, health research has lagged behind in including the perspectives of children with disabilities (Njelesani et al., 2022). Health studies tend to prioritize adult viewpoints, limiting a comprehensive understanding of the diverse health encounters experienced by children with disabilities (Clark, 2003). Caregivers may lack insights into their child’s experiences and subjective well-being (Scott, 2008), yet they offer valuable input into their communication (Dickins, 2004; Press et al., 2011), supplementing rather than replacing the views of children with disabilities. This exclusion is also apparent in oral health research, where a recent systematic review highlights the routine exclusion of children with disabilities from oral health research (Alwadi et al., 2018). The absence of the perspectives of children with disabilities significantly affects service provision and policy, impeding the identification of areas for improvement in oral health promotion initiatives and dental care services. This justifies the need for a range of methods, which include children as fully as possible, to ensure that research obtains their perspectives and hears their voices.

This paper aims to clarify the inclusive methodologies used in a research project that explored the inclusion of children with disabilities in oral health and research. Previous publications from this project primarily focused on children’s findings (Alwadi et al., 2022); this paper now focuses on developing methods to amplify the voices of children with disabilities. Reporting and reflecting on the methods employed with children with disabilities illustrates ways that researchers can actively include them. Embracing inclusive research methods and involving children with disabilities as active participants potentially provides valuable insights into their unique health needs, experiences, and challenges. Moreover, inclusive methods inform the development of interventions and supports systems that cater to the perspectives and requirements of children with disabilities. Prioritizing inclusivity in research significantly contributes

to enhancing health outcomes and the overall well-being of children with disabilities.

## MATERIALS AND METHODS

### Study context

This method-focused article is part of a broader project titled “The Inclusion of Children with Disabilities in Oral Health,” which employs a rights-based approach to explore ways of including children with disabilities in oral health. The original ethnographic study, conducted in Riyadh, Kingdom of Saudi Arabia (KSA), involved a sample of 30 participants: 10 children, 10 parents, 5 health-care providers, and 5 educators. Diverse research methods, including observations, semi-structured interviews, and inclusive activities with children, were used to enhance and facilitate data collection. The perspectives of the 10 children were previously published (Alwadi et al., 2022). This paper primarily focuses on explaining the process of inclusive method development within the broader project.

### Ethics

This study received ethical approval from the directors of two city sites in Riyadh, Saudi Arabia, along with the University of Sheffield Ethics Committee (reference: 018466). Following ethical guidance in qualitative research meant assigning pseudonyms to participants and altering identifiable characteristics to protect their identity. Parents also provided their consent to meet with their child and include them in the research. Children agreed to participate in the presence of their teachers but could withdraw at any time. The study conformed to the Declaration of Helsinki guidelines.

### Sampling/participants

The study employed a purposive sampling method to select potential child participants from two disability centers in Riyadh, KSA. Initially, the primary researcher spent a month as an observer at these centers to familiarize the children with their presence before any interactions took place. Guidance from caregivers and teachers, who were most familiar with the children, helped in identifying those who would be the least distressed by interacting with a researcher, aiding the recruitment process. With the assistance of carers and teachers in explaining the study, 10 girls between 9 and 15 years of age with a range of mild to moderate impairments, as determined from their records, voluntarily chose to participate. The children, originally from various regions of Saudi Arabia but currently residing in Riyadh, were all able to communicate verbally, albeit with varying degrees of fluency. The disabilities of the participants are detailed in Table 1.

**Table 1:** Characteristics of participating children.

Children	Age	Gender	Type of disabilities
L1	9	F	Intellectual disability (mild)
R2	10	F	Cerebral palsy (spastic quadriplegia)
D3	10	F	Intellectual disability (moderate)
B4	11	F	Intellectual disability (moderate)
H5	11	F	Intellectual disability (moderate)
H6	11	F	Cerebral palsy (spastic quadriplegia)
G7	12	F	Intellectual disability (mild)
D8	13	F	Intellectual disability (mild) with physical disability (cerebral palsy)
J9	14	F	Intellectual disability (moderate)
Y10	15	F	Intellectual disability (mild) with hearing impairment and epilepsy

## Data collection and analysis

Following ethnographic principles, pluralistic research methods were used to collect data, primarily involving participant observation, in-depth semi-structured interviews, and inclusive activities.

### Participant observation and semi-structured interviews

Participant observation began with the commencement of the fieldwork and continued during data collection. A female researcher visited the sites and observed for 3 h, every day, and 5 days a week, for 3 months to gain more familiarity with the layout of the place, the structure, the routines, and daily events of the institutions. The researcher utilized a classroom observation schedule to observe the social interactions of children with disabilities with other children, school members, and the communication methods used.

The observations enabled the researcher to individualize the methods used with the children during interviews and to modify their design. Participant observation also enabled exploration of children's interactions in their environment and their understanding of oral health without directly asking them. Field notes recorded observations and used them as a tool to reflect upon during the analysis. To familiarize the children with the researcher, guided tours (walk-to-talk) were conducted with each child to break the ice and build rapport.

The researcher also conducted the interviews with children, either individually or in pairs at their request. Conducting the interviews for each child or pair occurred over six sessions. Each session took from 40 to 60 minutes to complete.

The study sought to explore children's experiences; therefore, semi-structured interviews were appropriate. Questions guided the format of the interview, which took place at school. Social conventions meant, as a Saudi female, the researcher could not visit children's homes. Instead, the researcher spent time with each child on multiple occasions to increase familiarity and assess the level and method of communication. This occurred during consecutive break times and at least half an hour before the interview. At the outset of the interview, the researcher explained to the children what they

might do together, and children were given time to talk about anything they liked. This aimed to maximize the children's confidence in expressing themselves and increase researcher confidence in understanding their communication methods. Existing research guided the researcher on developing skills for working with children, understanding children's communication methods, and working on the child-researcher relationship. Disability activists view this as an essential part of the research process before conducting research activities (Abbott, 2013).

Using guidance from disability research (Kroll et al., 2007) about focus groups facilitating people with communication impairments, the researcher decided to interview the children in two groups, each comprising five children. Previous research suggests focus group interviews achieve goals because they may be less difficult than individual interviews for young children and can diffuse the balance of power between adult interviewer and child interviewees (Mauthner, 1997; Smith and Taylor, 2000; Brooker, 2001). Where requested by the children, the researcher conducted some interviews individually or in pairs.

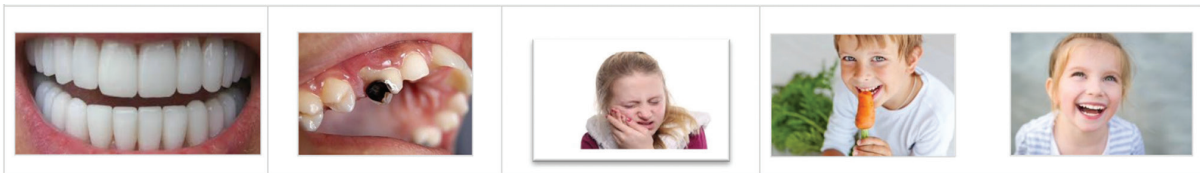
### Inclusive methods with children with disabilities

The academic evidence on inclusive methods guided the development of the research methods. The experience and knowledge of teachers at the schools and the methods that they used to enable children's participation complemented the evidence. For example, if teachers used pictures most of the time, incorporating this as a method appeared pragmatic because children were familiar with this approach and unlikely to find it stressful. Teachers made some suggestions, such as simplifying the format of the questions, or using images to explain some questions. This level of expertise and experience proved facilitative and invaluable. Therefore, multiple approaches of data collection were used, including observation, semi-structured interviews, using some pictures and games, to aid in engaging children and ease data collection.

A range of inclusive creative methods such as guided tours "walk-to-talk", in addition to pictures (Table 2) and games (Figs. 1-4) were developed and used to stimulate children's responses. The choice and presentation of these

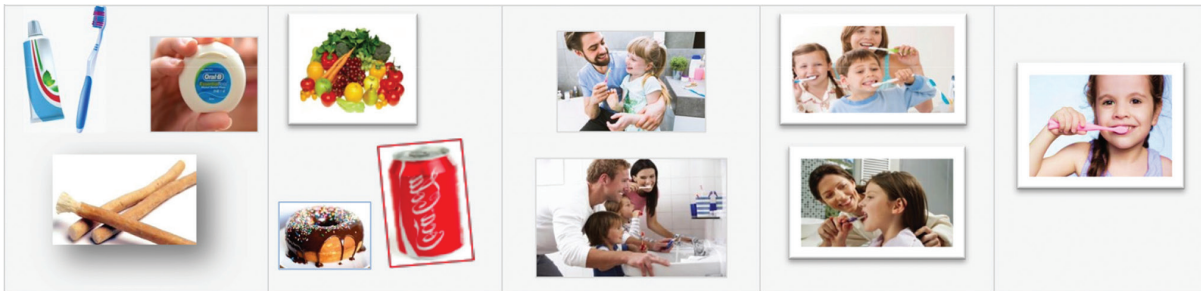
**Table 2:** Pictures used during the interviews.

**Oral health**



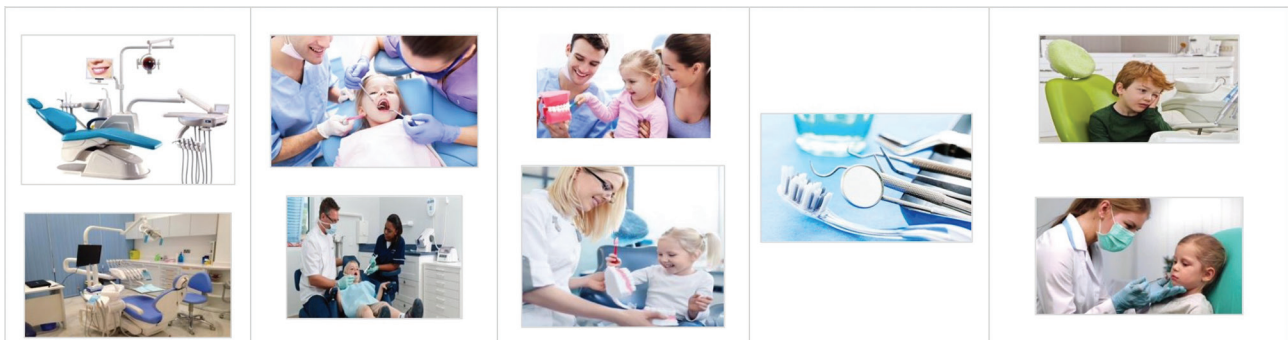
✓ What do you see in this picture? What do they know about teeth? What caused the pain? What do we get from our teeth? Why are teeth important to us? Is there anything you want to tell me about your teeth?

**Oral health practices**



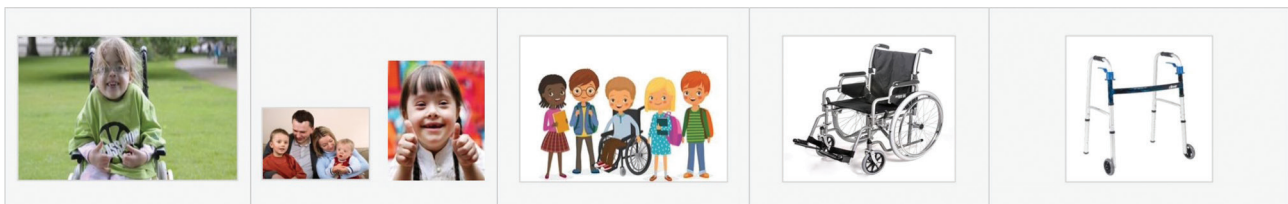
✓ What do you see in this picture and what do you know about it? What do they use to clean their teeth? How many times, for example, do children clean their teeth, who will help them, and how? Does someone help them clean their teeth (such as a father, mother, brother, or sister), or do they clean their teeth by themselves? Can you tell me the differences between the two pictures? (Such as healthy and unhealthy food.)

**Dental clinic**



✓ What do they know about the dentist and the dental clinic? Why do children go to the dentist? Why do grown-ups go to the dentist? What do they think helps them when they go to the dentist? How they were feeling in the dental clinic, what did they like best, what they did not like, what did they find difficult, and what did they not find difficult? Does the dentist talk to you? Is she/he kind? Do you like visiting him/her?

**Concept of disability**



✓ What do you see in this picture? What does disability mean to children? Who uses a wheelchair or a walker?

methods varied (along with more traditional interviewing question-and-answer discussion) for each child, depending on their abilities and engagements. Digital recording was used to record all interviews and then transcribed verbatim for analysis purposes.

**Analysis**

The study employed reflexive thematic analysis (RTA) (Braun and Clarke, 2006; Braun and Clarke, 2019) to interpret the data, emphasizing the researcher’s active role and



Figure 1: Symbols.



Figure 2: Sorting game.



Figure 4: Balancing game.



Figure 3: Matching game for children with physical disabilities.

challenging traditional approaches to theme emergence. RTA enabled data to guide the analysis, focusing on individual experiences and identifying societal barriers through the lens of the social model of disability. The six stages of RTA, including familiarization (where researchers immersed themselves in the data), generating codes (identifying key concepts), generating initial themes (organizing initial codes into broader themes), refining codes and themes (clarifying and consolidating themes), determining theme essence (distilling core meanings), and the final report (synthesizing findings for dissemination), which facilitated a transparent analysis process. The previous

paper, published by the researchers, provides more comprehensive details on the analysis process (Alwadi et al., 2022).

## RESULTS

This section outlines the study’s results of using inclusive research methods, detailing the development process of inclusive research methods, and providing reflections on their application.

## Guided tours/walk-to-talk

Conducting guided tours occurred during data collection. The researcher invited each participating child to take her on a school tour to show the places they loved or disliked. Children usually guided the way, walking ahead, introducing sites and individuals who worked as tutors and gatekeepers to their worlds. When stopping somewhere, more follow-up questions occurred, such as ‘What do you usually do here?’ ‘Who will come with you here?’ ‘Why do you like or dislike this place?’ ‘What could improve things?’ Based on what children liked, modification was made to the manner of asking questions, encouraging them to engage and share their experiences more spontaneously, such as using exclamatory questions that proved to be effective in facilitating interaction during guided tours and other activities. Conversations with children were recorded and transcribed.

Most children started talking about their school life as soon as they started the tour. Walking side by side increased the children’s ability to chat informally and appeared to reduce the power imbalances created by formal or structured interviews. Children appeared to find the activity interesting and enjoyable. Some children used this activity as a way to escape the classroom because it gave them the opportunity to access restricted areas. Other children felt that 30 minutes was insufficient to show more of their school, and a few children felt tired, got bored very quickly, or wanted to return to the classroom. This method appeared to be undesirable for wheelchair users because the researcher became the one who guided them. Below is an example of a guided tour interaction with a 14-year-old girl with a moderate intellectual disability. She led the tour, sharing insights:

*“I sit here with my classmates, and we have our meals. There is one of my classmates is sick, she always sits in the wheelchair, and we help her, I push her wheelchair, she doesn’t do anything by herself, she is always with her maid. I love all girls; I don’t fight any.” “J9, 14 years old”*

## Symbols

Four symbols, namely the “Sad Face,” “Happy Face,” “Red Stop,” and “Question Mark” (Fig. 1), were used with children to express their emotions, needs, and inquiries during the activities. These symbols, accompanied by corresponding facial expressions, served as a means for the children to convey their feelings. For instance, the “Question Mark” was employed when they had queries or wished to make requests, allowing them to actively participate in asking questions instead of solely relying on the researcher. The “Red Stop” signal provided a way for children to indicate a desire to discontinue the activity if they felt uncomfortable or unwilling to proceed. If children did not use the signals, the researcher listened to them and complied with their requests.

Although research claims success for this method (Ajodhia-Andrews, 2016), during this current study, most children did not use the symbols because they found it difficult to focus on doing multiple tasks simultaneously.

## Children’s drawings

Existing research suggests that drawings often serve as an enjoyable or engaging method for children to express their views and experiences (Curry and Russ, 1985; Williams et al., 1989; Eiser et al., 1990; Backett and Alexander, 1991; Oakley et al., 1995). For example, as an icebreaker to assist children in establishing rapport, as catalysts and triggers to remember or stimulate discussion, or assisting children in organizing their own narratives. The method may support children to gain more control over the interview.

This study used drawing to stimulate children’s responses during interviews. Pencils and paper were provided to participating children in case they felt the need to express themselves through drawings and pictures. Asking children to draw pictures of what they did and did not like at the dental clinic and at school and what they were drawing was accompanied by more follow-up questions. While recording the activity, the researcher wrote the children’s responses on the back of the paper. However, many children struggled with this activity, because of physical impairments, poor on-task concentration, or because they found it boring. Children often forgot the question and drew only what they wanted to draw, regardless of the research question. When this happened, the children were given time to make drawings of their choice, and then they were asked to make a particular drawing, but it was still difficult for them to maintain focus. Drawing as a method acted as a distraction from the research focus for the children. Discontinuation occurred when children revealed they did not enjoy the process.

*“I hate drawing because I am very bad at drawing. I like to match healthy and unhealthy food with an appropriate tooth and then I will explain to you why I answered like that” (H5, 11 years old)*

*“Sorry!! I cannot draw. My hands do not allow me to do so... I would prefer to do matching” (H6, 11 years old)*

Haneen and Haya disliked drawing; Haya because of her physical impairments and Haneen because she struggled with concentration and staying on task. The other activities did not create excessive cognitive load or physical expectations and both participants felt happier and that they could still take part. Despite research with children without disabilities arguing in favor of this method (Clark, 2005; Leonard, 2006), for this group of children, the method created a barrier to their inclusion.

## Interviews

Findings showed that interviewing children in two groups, with five children in each, did not work well, partly because the researcher lacked experience managing a group of five children with disabilities with differing needs and abilities. The children appeared to find being in a group distracting, finding it challenging to focus. Some children were more articulate and despite efforts, not all children got an opportunity to speak. Consequently, the use of focus groups hindered the participation of some children. As a result, the

researcher modified the interviewing format to conduct it in pairs; this worked much better. These interviews were conducted in a small, quiet room with minimal distractions. Individual interviews with four children occurred at their request because they did not like speaking in front of their friends. J9, aged 14, mentioned feeling at ease when having a one-on-one conversation: *“I feel more comfortable talking when it’s just me and you. I can say what I want without feeling shy.”* On the other hand, H6, aged 11, expressed enjoyment in conversing with a friend: *“Talking with a friend is fun. We want to play and chat together.”* The switch to individual and pair interviews highlighted the importance of creating environments where children feel comfortable and at ease to communicate openly. This adjustment allowed them to express themselves freely without any inhibitions.

### Pictures as facilitators

This study used pictures as visual aids during interviews with children, which are often used in existing research with children, as a means of providing visual references to the subjects covered in an interview (Curry and Russ, 1985; Eiser et al., 1990; Backett and Alexander, 1991), and as a means of stimulating conversation (Graue et al., 1998). The researcher selected these pictures based on specific criteria, including being substantial, simple, realistic, of high quality, and durable. Prior to lamination, the researcher worked with the children, observing and documenting their responses, to ensure that they could accurately recognize and interpret the depicted images. This observational approach complemented the validation process, contributing to the overall effectiveness of the pictures as visual aids during the interviews.

Different sets of pictures (Table 2) eased conversations with the children. Five pictures depicted oral health (e.g. healthy and decayed tooth), and 11 pictures represented oral health practices (e.g. toothbrush, toothpaste, toothpick, healthy, and unhealthy food). There were nine pictures of the dental clinic (such as a dental chair, dental instruments, and a picture showing dental treatment) and six pictures illustrating societal representations of the concept of disability, for example, a child in a wheelchair with his friends. Two instances exemplify the use of pictures during interviews (see Table 3).

The children also recognized the dental environment, including dental equipment from the pictures the researcher showed them, for example, the tools used by the dentist. Children described what happened to them at the dentist and imitated the sounds of the equipment.

*“...this is a chair, and this makes sounds (teeth tools). This is water; if you have your teeth pulled out, you need to rinse your teeth here (the sink). This is a light; the dentist uses it to see the teeth”.* (B4, 11 years old)

*“I see a chair and a needle. This is water (suction); this is a sink and paste; this is a light to help the dentist see my teeth”.* (H5, 11 years old)

**Table 3:** Practical examples of using pictures.



**Example 1:**

D3 is 10 years old and has a moderate intellectual disability.

The picture helped D3 express her point of view when she saw a picture on the table, although I had not shown her that particular picture.

D3 said: *“I took a picture of a mother with her children [the selected photo above]. I love this family because the mother is with her daughter, it is the mother’s duty to stay with her daughter and to show her love and care...”*



**Example 2:**

B4 is 11 years old and has a moderate intellectual disability.

B4: *“In this picture [pictured below] pointing to nondisabled children: they can play and walk alone, but this (the disabled child) he must go with his mother, so that she helps him. These two can walk (she pointed to nondisabled children); all of them could walk except this boy (she pointed to the disabled child); he needs a chair and a woman to help him. This child was playing in the garden, the metal fall on his leg, his leg is broken and that’s why he cannot walk”*

These examples illustrate how pictures effectively facilitated communication with children, allowing them to express their thoughts and perceptions. The visual prompts encouraged storytelling and enabled the children to articulate their perspectives on family dynamics and societal perceptions of disability. The images served as powerful triggers for discussion, evoking emotions and providing tangible reference points for the children to convey their understanding of dental experiences and societal attitudes toward disability. This underscores the significance of using carefully selected visuals as tools to engage children in meaningful dialogue and express their viewpoints effectively during research interviews.

### Games as facilitators

The lead researcher designed four games with the aim of making the research fun while enabling children to express their views. Although the games contained the same ideas or were related to the same knowledge, utilizing different



designs occurred for various reasons. First, they promoted engagement by being more attractive to children. Second, the variety of games helped researchers to change the game quickly if it did not enable children to express their views, or they began to feel tired. Finally, accommodating the diverse abilities of children necessitated method adaptation, promoting greater inclusivity. The games employed included a sorting game, a matching game, an adapted matching game tailored for children with physical impairments unable to hold a pen, and a balancing game.

### Sorting game

Both in paired and individual interviews, children arranged pictures of healthy and unhealthy foods based on their preferences. They then categorized these images into “good for your teeth” and “bad for your teeth” groups. A table displayed two A4-sized pictures of a happy tooth and a sad tooth (see Fig. 2). Children decided if food pictures were healthy or unhealthy for their teeth and placed these next to the appropriate tooth. They externalized their thinking on comparisons between images and the logical basis of their decisions. After indicating that they were happy with the results, children explained the order they had selected. Further follow-up questions were as follows: Why did you put this picture here? What is good about it? What makes you dislike this? The researcher photographed final arrangements and recorded the children’s utterances.

Most children explained their answers while sorting the images, which showed their understanding. Furthermore, some discussed the consequences of eating unhealthy food and gave a rationale for eating healthy food. This method enabled them to discuss their knowledge and practices in depth.

*“I arranged them like that because the healthy food strengthens the teeth, while the other breaks them”.*  
(D8, 13 years old)

*“... because ice cream hurts the teeth. I put milk in the smiley tooth list because it makes the teeth stronger”.*  
(D3, 10 years old)

*“... we should have healthy food and drinks like fruit and milk. But the unhealthy food like chocolate and soft drinks, we should stay away from it to keep our teeth free from tooth decay”.* (Y10, 15 years old)

These instances indicate that the sorting game prompted children to think critically about dental health and food choices. It encouraged them to categorize foods based on their impact on teeth, fostering logical thinking and allowing them to express preferences. This approach revealed more about children’s views and reasoning, illustrating how the game prompted thoughtful discussion and engagement during the research interviews.

### Matching game

The idea of this task was similar to that of the sorting game but it was designed differently. In this task, the researcher

gave a worksheet to the children, asking them to link healthy and unhealthy foods with the appropriate tooth. Children then explained their answers. Follow-up questions were as follows: “What are the consequences of eating healthy or unhealthy food?” Recording occurred through photographs of the worksheets and children’s verbal responses during the activity.

*“...we matched it this way, because this is healthy food (she referred to the fruits), the other isn’t (she referred to do not), and it causes tooth decay”.* (R2, 10 years old)

The children’s feedback reflected their enthusiasm for the research activity, indicating their enjoyment and engagement:

*“I love your research! You’re studying, and we’re having fun!”* (B4, 11 years old)

*“You have so many games, and I love playing them. It’s more fun.”* (D8, 13 years old)

This activity proved effective for children with intellectual disabilities, but posed challenges for children with physical impairments due to their inability to use pens or pencils for writing. Consequently, further adaptations were necessary.

### Specific matching game for children with physical disabilities

Using four laminated sheets for children with physical impairments on oral health, containing similar ideas to those of the previous activities, but with different ways of completing the activity, formed another method. Children were asked to choose the correct answer by placing stickers, using fingerprints, drawing a circle using a glossy paste, or dragging the direction to the correct answer (see Fig. 3). Digital recording of children’s responses was performed.

### Balancing game

Another method involved using a balancing game. Children chose the correct answers by placing a weight on the right answer; for example, placing healthy and unhealthy foods on both sides of the balance. Children placed the weight on the side of the food that keeps the teeth healthy or the food they liked (see Fig. 4). The children found this game very enjoyable.

*“I chose the heavy block for milk ‘cause it keeps teeth happy! Can we play more? It was so much fun!”* (R2, 10 years old)

*“Can we do this game tomorrow? This is so funny”* (G7, 12 years old)

*“I love your class; this is really fun”* (D3, 10 years old).

This game’s popularity among the children demonstrates its engaging nature and their eagerness to continue participating,

emphasizing its effectiveness in tailoring the task to their abilities, while simultaneously making the research experience enjoyable and interactive.

## DISCUSSION

The outcomes of this study provides evidence for the active participation of children with disabilities in oral health research through the utilization of diverse and creative methodologies. Recognizing the capabilities of these children was fundamental for fostering their active engagement. The researcher's flexibility and utilization of various methods in accordance with cultural sensitivities not only promoted inclusion but also empowered children to express themselves authentically. These activities were perceived positively by the children, creating an engaging and nonthreatening environment. This study aligns with existing research, suggesting that employing multimethod approaches with children with disabilities enhances inclusivity and allows children to leverage their individual strengths (Ajodhia-Andrews, 2016).

The study also revealed that certain methods were more conducive to inclusion than others, while some posed barriers to participation. The guided tour (walk-to-talk) activity proved productive as it facilitated the development of relationship with the children. Additionally, it encouraged informal chatting and appeared to mitigate the power imbalance compared to formal, structured interviews. This approach finds support in previous research involving non-disabled children (Clark and Moss, 2011) and extends the evidence base by including children with disabilities in oral health research. Nevertheless, symbols posed challenges and drawings caused distractions and discomfort for some participants. This contrasted with previous research findings arguing in favor of their effectiveness (Leonard, 2006; Fane et al., 2016). Using pictures as prompts did however enable children's participation and enhanced their ability to express views in greater depth. Pictures emerged as effective tools, facilitating conversations and serving as visual aids, consistent with previous research (Coussens et al., 2020; Floríndez et al., 2021). Games significantly enriched the research experience, enabling children to engage and express their thoughts. Adapting methods to match their diverse abilities notably promoted inclusivity.

Despite prior literature suggesting that focus groups could be effective for young children, putting them more at ease and reducing power imbalances (Smith and Taylor, 2000; Brooker, 2001), this study revealed otherwise. The focus groups did not yield successful results, partly due to the limited experience of the researcher in managing a group of five disabled children with varying needs and abilities. Individual and pair interviews emerged as preferable options, fostering familiarity and allowing for detailed questioning.

Despite efforts to facilitate communication with the children, there were times when difficulties occurred, such

as when children refused to respond if they were tired or wanted to play. Overcoming this barrier meant staying in the school environment for extended periods and providing the children with frequent breaks. Communicating with their teacher before the activity mitigated some challenges because the teacher knew them the best and offered guidance on communication. Reflecting on examples of previous learning when scheduling subsequent interactions increased participation, for example, learning to allow the children to finish their comments, regardless of their relevance, valuing their ideas and reducing feelings of obligation to commit to the researcher's interests. Although most children communicated verbally, some needed more time because they had communication impairments. Overcoming these challenges required staying with the child over a few weeks and using small chunks of time that were manageable for each child. Paying attention to diversity between children with disabilities while implementing innovative and pluralistic methods is important for engendering inclusion in oral health research and valuing children's voices.

The evidence in this study underlines that research methods are powerful tools of inclusion, but this depends on how they are developed and designed. Researchers hold the responsibility to create ways for children with disabilities to participate in research, promoting a rights-based approach that acknowledges diversity and reduces discrimination. It is crucial for researchers to prioritize inclusive methodologies tailored to the diverse needs of children with disabilities, collaborating closely with close adults in children's lives, such as educators and parents, and establishing comprehensive guidelines for inclusive research practices. Cultural differences can significantly influence the methods employed in research. For example, in some cultures, oral health practices and attitudes may differ significantly from others, highlighting the importance of researchers being mindful of these nuances when designing research methodologies. In addressing these considerations, researchers can ensure the meaningful involvement of children with disabilities, amplify their voices, and contribute to decision-making processes that positively affect their lives.

## ACKNOWLEDGMENTS

The authors extend their appreciation to the King Salman Center for Disability Research for funding this work through Research Group no KSRG-2023-171.

## FUNDING

The research was funded by the King Salman Center for Disability Research (funder ID: <http://dx.doi.org/10.13039/501100019345>) through Research Group no KSRG-2023-171.

## REFERENCES

- Abbott D. (2013). Who says what, where, why and how? Doing real-world research with disabled children, young people and family members. In: *Disabled Children's Childhood Studies: Critical approaches in a global context*; pp. 39-56, Palgrave Macmillan UK, London.
- Ajodhia-Andrews A. (2016). Reflexively conducting research with ethnically diverse children with disabilities. *Qual. Rep.*, 21(2), 252.
- Alwadi M.A., Baker S.R. and Owens J. (2018). The inclusion of children with disabilities in oral health research: a systematic review. *Community Dent. Oral Epidemiol.*, 46(3), 238-244.
- Alwadi M.A.M., Baker S.R. and Owens J. (2022). Oral health experiences and perceptions of children with disabilities in the Kingdom of Saudi Arabia. *Int. J. Paediatr. Dent.*, 32(6), 856-864.
- Ash A., Bellew J., Davies M., Newman T. and Richardson L. (1997). Everybody In? The experience of disabled students in further education. *Disabil. Soc.*, 12(4), 605-621.
- Backett K. and Alexander H. (1991). Talking to young children about health: methods and findings. *Health Educ. J.*, 50(1), 34-38.
- Braun V. and Clarke V. (2006). Using thematic analysis in psychology. *Qual. Res. Psychol.*, 3(2), 77-101.
- Braun V. and Clarke V. (2019). Reflecting on reflexive thematic analysis. *Qual. Res. Sport Exerc. Health.*, 11(4), 589-597.
- Brooker L. (2001). Interviewing children. In: *Doing Early Childhood Research: International Perspectives on Theory and Practice*; (McNaughton G., Rolfe S. and Siraj-Blatchford A.I., eds.), pp. 162-177, Open University Press, Buckingham.
- Clark C.D. (2003). *In Sickness and in Play: Children Coping with Chronic Illness*, Rutgers University Press.
- Clark A. (2005). Listening to and involving young children: a review of research and practice. *Early Child Dev. Care.*, 175(6), 489-505.
- Clark A. and Moss P. (2011). *Listening to Young Children: The Mosaic Approach*, Jessica Kingsley Publishers, London.
- Connors C. (2003). *The Views and Experiences of Disabled Children and Their Siblings: A Positive Outlook* (Stalker K, ed.), Jessica Kingsley Publishers, London.
- Coussens M., Destoop B., De Baets S., Desoete A., Oostra A., Vanderstraeten G., et al. (2020). A qualitative photo elicitation research study to elicit the perception of young children with developmental disabilities such as ADHD and/or DCD and/or ASD on their participation. *PLoS One*, 15(3), e0229538.
- Curry S.L. and Russ S.W. (1985). Identifying coping strategies in children. *J. Clin. Child Psychol.*, 14(1), 61-69.
- Davis J., Watson N. and Cunningham-Burley S. (2012). Learning the lives of disabled children: developing a reflexive approach. In: *Research with Children*; pp. 213-236, Routledge, London.
- Dickins M. (2004). *Listening to Young Disabled Children. Listening as a Way of Life Leaflet Series*, National Children's Bureau.
- Einarsdottir J. (2005). Playschool in pictures: children's photographs as a research method. *Early Child Dev. Care.*, 175(6), 523-541.
- Eiser C., Eiser J.R. and Jones B.A. (1990). Scene schemata and scripts in children's understanding of hospital. *Child Care Health Dev.*, 16(5), 303-317.
- Fabbretti D., Pizzuto E., Vicari S. and Volterra V. (1997). A story description task in children with Down's syndrome: lexical and morphosyntactic abilities. *J. Intellect. Disabil. Res.*, 41(2), 165-79.
- Fane J., MacDougall C., Jovanovic J., Redmond G. and Gibbs L. (2016). Exploring the use of emoji as a visual research method for eliciting young children's voices in childhood research. *Early Child Dev. Care.*, 188(3), 359-374.
- Floríndez L.I., Floríndez D.C., Price M.E., Floríndez F.M., Como D.H., Polido J.C., et al. (2021). Exploring eating challenges and food selectivity for latinx children with and without autism spectrum disorder using qualitative visual methodology: implications for oral health. *Int. J. Environ. Res. Public Health.*, 18(7), 3751.
- Graue M.E., and Walsh D.J. (1998). *Studying Children in Context: Theories, Methods, And Ethics*, Sage, Thousand Oaks, CA.
- James A., Jenks C. and Prout A. (1998). *Theorizing Childhood*; pp. 81-104, Routledge, New York.
- Kroll T., Barbour R. and Harris J. (2007). Using focus groups in disability research. *Qual. Health Res.*, 17(5), 690-698.
- Leonard M. (2006). Children's drawings as a methodological tool: reflections on the eleven plus system in Northern Ireland. *Ir. J. Sociol.*, 15(2), 52-66.
- Marchant R., Jones M., Julyan A. and Giles A. (2001). *'Listening on All Channels': Consulting with Disabled Children and Young People*, East Sussex, County Council.
- Matthews H. and Limb M. (1998). The right to say: the development of youth councils/forums within the UK. *Area*, 30(1), 66-78.
- Mauthner M. (1997). Methodological aspects of collecting data from children: lessons from three research projects. *Child. Soc.*, 11(1), 16-28.
- Minkes J., Robinson C. and Weston C. (1994). Consulting the children: interviews with children using residential respite care services. *Disabil. Soc.*, 9(1), 47-57.
- Morris J. (2003). Including all children: finding out about the experiences of children with communication and/or cognitive impairments. *Child. Soc.*, 17(5), 337-348.
- Njelesani J., Mlambo V., Deneke T. and Hunleth J. (2022). Inclusion of children with disabilities in qualitative health research: a scoping review. *PLoS One*, 17(9), e0273784.
- Oakley A., Bendelow G., Barnes J., Buchanan M. and Husain O. (1995). Health and cancer prevention: knowledge and beliefs of children and young people. *Br. Med. J.*, 6986(310), 1029-1033.
- Oliver M. (2018). *Understanding Disability: From Theory to Practice*, Bloomsbury Publishing, London.
- Press F., Bradley B., Goodfellow J., Harrison L., McLeod S., Sumsion J., et al. (2011). Listening to infants about what life is like in childcare: a mosaic approach. In: *Listening to Children and Young People with Speech, Language and Communication needs* (Roulstone S. and McLeod S., eds.); pp. 241-248, J and R Press, Guildford.
- Punch S. (2002). Interviewing strategies with young people: the 'secret box', stimulus material and task-based activities. *Child. Soc.*, 16(1), 45-56.
- Roulstone S. and McLeod S. (2011). *Listening to Children and Young People with Speech, Language and Communication Needs*, J & R Press Limited, Albury, UK.
- Scott J. (2008). Children as respondents: the challenge for quantitative methods. In: *Research with Children*; pp. 103-124, Routledge, London.
- Smith A.B. and Taylor N.J. (2000). *Children's Voices: Research, Policy and Practice*, Longman, Auckland.
- Stalker K. and Connors C. (2003). Communicating with disabled children. *Adopt. Foster.*, 27(1), 26-35.
- Such E. and Walker R. (2005). Young citizens or policy objects? Children in the 'rights and responsibilities' debate. *J. Soc. Policy*, 34(1), 39-57.
- UNCPRD. (2006). *United Nations Convention on the Rights of Persons with Disabilities*, United Nations Centre for Human Rights. <https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-persons-disabilities> (Accessed 12 November 2023).
- UNICEF. (1989). *Convention on the Rights of the Child (1989) Treaty no. 27531*; pp. 3-178, United Nations Treaty Series, 1577. <https://www.ohchr.org/sites/default/files/Documents/ProfessionalInterest/crc.pdf> (Accessed 12 November 2023).
- Verhellen E. (2000). *Convention on the Rights of the Child: Background, Motivation, Strategies, Main Themes*, Gent University, Children's Rights Centre, H, Gent, Belgium (795 Belgian Francs).
- Williams T., Wetton N. and Moon A. (1989). *A Picture of Health: What do you do that Makes you Healthy and Keeps you Healthy?*, Health Education Authority, London.