



REVIEW ARTICLE

Necessity and relevance of qualitative research in pediatric dentistry. A literature review



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KEYWORDS

Children;
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Mothers behavior

Abstract Objectives: This review aims to understand the essence and relevance of qualitative research in pediatric dentistry and summarizes the most important information needed for a pediatric dentist before conducting a qualitative study.

Methods: An electronic search was conducted on studies published from December 2019 until December 2021 using PubMed, Scopus, and King Abdulaziz University Digital library. Several keywords were used to identify the studies for this review.

Results: Thirty-three studies involving qualitative methods in pediatric dentistry have been conducted on parents and dentists. Qualitative studies in pediatric dentistry are used to explore the perceptions of mothers and their children and to understand their behavior in different areas related to pediatric dentistry. Barriers to conducting qualitative studies with children include credibility, the influence of others on children’s opinions, and differences that influence children’s behavior while conducting the study.

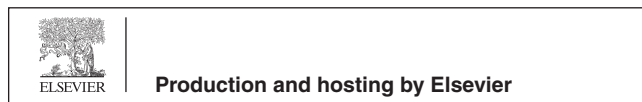
Conclusion: Qualitative methods in pediatric dentistry have been conducted on parents and dentists; however, little is known about the credibility and trustworthiness of conducting qualitative research with children. Future studies are needed to investigate effective interview techniques with children and more research should be conducted to evaluate the credibility and trustfulness of using children as a source to collect data in qualitative research.

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Contents

1. Introduction	32
2. Methods	32

Abbreviations: ASD, autism spectrum disorder; CAQDAS, computer-assisted qualitative data analysis software
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3.	Review results	32
3.1.	Qualitative versus quantitative studies.	32
3.2.	Types of qualitative methods that can be used.	32
3.3.	Sampling in qualitative research	34
3.4.	Analysis of qualitative data	34
3.5.	Social factors affecting oral health in children	34
3.6.	Using qualitative methods in pediatric dentistry.	35
3.7.	Collecting qualitative data from parents	36
3.8.	Collecting qualitative data from children.	36
4.	Discussion	36
5.	Conclusion	37
	Declaration of Competing Interest	37
Appendix A.	Supplementary material	37
	References.	37

1. Introduction

Qualitative research is based on distinctive methodological methods of inquiry that explore a social problem. Researchers in qualitative research build a complex holistic picture, analyze words, reflect a comprehensive view of the informants, and conduct a study in a normal setting (Thompson Burdine et al. 2021). This means that qualitative researchers interpret phenomena in terms of the meaning people ascribe to them. This type of research involves collecting various materials that describe routine moments in individuals' lives (Aspers and Corte 2019).

Pediatric dentistry is a specialty that requires an understanding of the philosophical background of child development in oral health and disease (Cameron and Widmer 2013). Dental health professionals should be a part of the community as dental caries should be seen within a family social context. The success of a pediatric dentist not only depends on finishing operative procedures and the treatment of a child. Understanding child development, and the physical, cognitive, and social factors related to their dental outcome in the future is also important (Cameron and Widmer 2013, Townsend and Wells 2019). Pediatric dentistry requires an understanding of the social and cultural factors that affect the health and behavior of children.

Additionally, understanding parental behaviors and attributes can influence the development of dental decay in their children. Parents' education, income level, and ethnicity are the most pertinent social determinants for dental caries formation in their children (Hooley et al. 2012).

Research in pediatric dentistry has mostly been quantitative in nature, driven recently by a drive toward evidence-based dentistry (Stewart et al., 2008). Few qualitative studies have been published related to dental public health and pediatric dentistry. Dentists have a strong positivist background and are usually inexperienced in qualitative research and feel less confident about its reliability (Wilson 2010, Margaritis et al. 2012). Therefore, the aim of this review is to understand the necessity and relevance of qualitative research in pediatric dentistry.

2. Methods

An electronic search was conducted on recent studies published from December 2019 until December 2021 using PubMed, Scopus, and King Abdulaziz University Digital library. Several keywords were used to identify the studies for this review including

pediatric dentistry, qualitative study, mixed-methods study, focus group discussion, interviews, observations, children oral health, dental caries, dental fear, protective stabilization, restraint, early childhood caries, pediatric dentists.

3. Review results

The results of our search were able to retrieve 25,002 articles which were obtained from three different database. After the removal of the duplicate results, only 350 articles remained in the screening. Finally, only 33 articles were obtained using the electronic search (Fig. 1). Several qualitative studies were conducted to explore the perceptions of mothers and their children and to understand their behavior in different areas related to pediatric dentistry. This review highlights the most important information needed for a pediatric dentist before conducting a qualitative study and highlights some examples of qualitative studies that implemented different qualitative methods.

3.1. Qualitative versus quantitative studies

Qualitative research uses an inductive and interpretivist paradigm, while quantitative studies use a positivist and realism paradigm (Arghode 2012). Qualitative data usually yields non-numerical data, such as words, images, and categories, while quantitative studies usually produce numerical data (Antwi and Hamza 2015). The main differences between qualitative and quantitative studies are presented in Table 1. The level of evidence from qualitative study is level VI but lower than most quantitative research (Astroth and Chung 2018).

To obtain complementary findings and to strengthen research results, the literature supports the use of both quantitative and qualitative strategies in the same study (Thurmond 2001, Renz et al. 2018). Triangulation can strengthen a study by creating an in-depth understanding of a phenomenon through unique findings, challenge or integrate theories, and provide a clearer understanding of a problem; however, triangulation may also increase the amount of time needed compared to single strategies (Thurmond 2001).

3.2. Types of qualitative methods that can be used

Several study designs can be used in qualitative studies, including ethnography, phenomenological study design, life history,

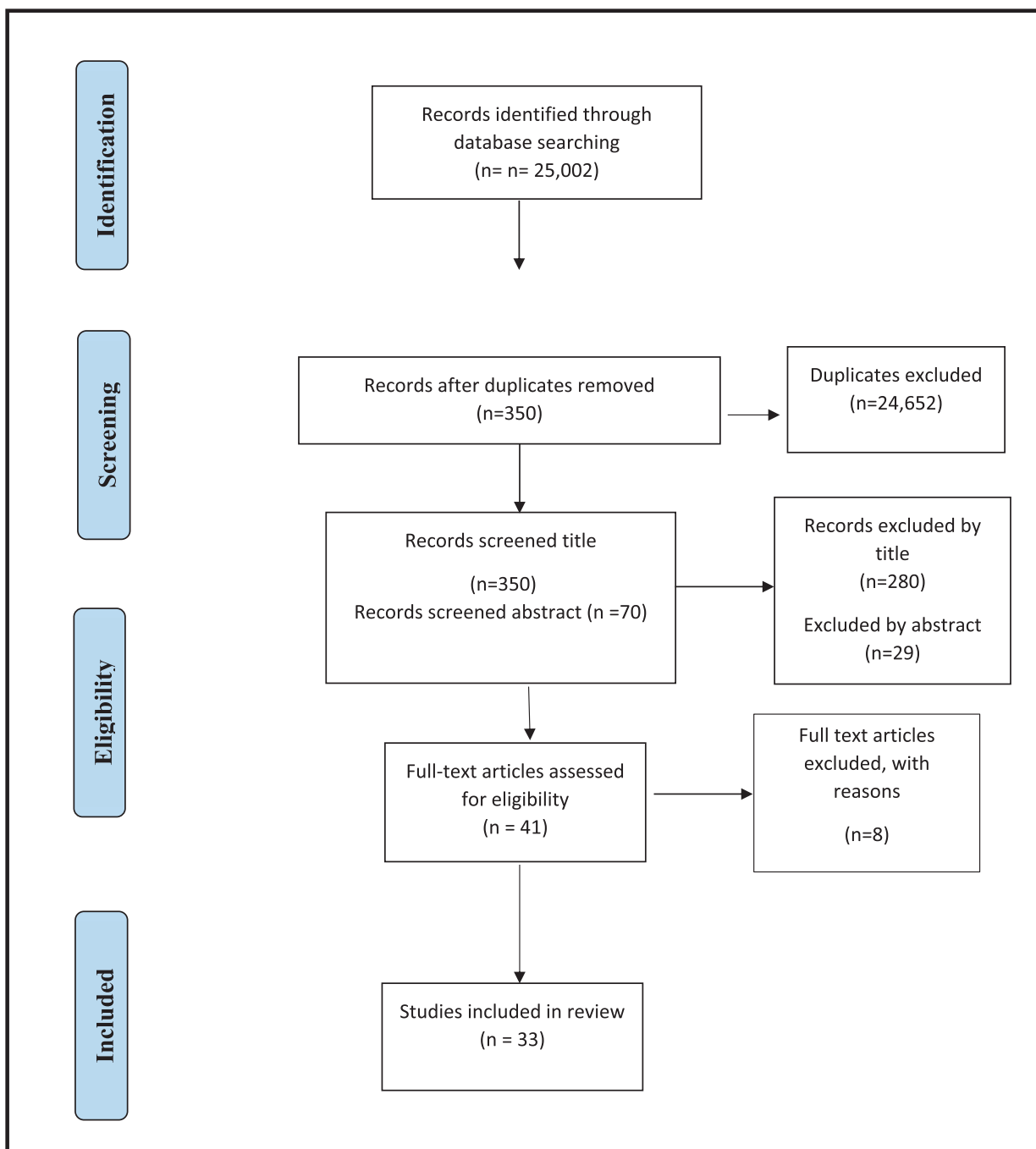


Fig. 1 A Flow diagram shows the number of articles identified at each stage of the research.

action research, and grounded theory (Merriam 2002). Ethnography is one of the most common study designs used in qualitative research and simply studies how people interact with their social environment (Malagon-Maldonado 2014). This type of study design is used to show people’s behavior within a cultural context. Interviews, field notes, and participant observations can be used in ethnographic study design (Blomberg et al. 2017). An example of an ethnographic study design in pediatric dentistry is a mixed study that compares school meal selection and the content of packed lunches in children with different sugar intakes in two different school

environments in England (Baghla et al. 2020). This study showed that home environment has an impact of children’s choices at school lunch.

Phenomenological study design explores the experiences of unique individuals within a given context—including those with a specific condition or disease—and how they describe their lived experience. In pediatric dentistry, a good example of a phenomenological study design would be a study that describes the lived experiences of adolescent girls diagnosed with cleft lip and palate (Tiemens et al. 2013). The findings of this study highlighted the fact that adolescent girls diag-

Table 1 The main differences between qualitative and quantitative studies.

Research aspect	Qualitative research	Quantitative research
The approach	Inductive approach which means hypotheses are developed during research	Deductive approach which means hypotheses are stated before starting the study
Research questions (Objectives to be used)	Explore, describe, assess, identify, and generate	Compare, effect, cause, and association
Common purpose	To discover an idea	To test hypothesis
Data collection	Unstructured, free forms	Structured response
Sample	Sample is purposively selected	Sample is selected to represent the population
Sample size	Number of interviews/focus groups is not based on sample size calculation but based on data saturation	Number of participants is based on sample size calculations
Analysis	Data is analyzed into narrative forms involving themes and patterns	Data is analyzed in numerical forms involving tables and numbers
Reliability and validity	Determined using multiple sources (triangulation)	Determined using statistical methods

nosed with cleft lip and palate can experience stress associated with living with a facial deformity; however, they find ways to cope with the this feeling (Tiemens et al., 2013).

Life history is a study design that documents a participant's life over their live course to capture chronological experiences over the time (Nelson 2010). This type of study design focuses on an emic prospective and often involves multiple interviews to enhance trust (Sinkovics and Alfoldi 2012). In pediatric dentistry it can be used to understand parents and children's perceptions and behavior. For example, a qualitative study could capture parents' experiences within the social context of poverty (Muirhead et al. 2013). This study would aim to understand low-income parents' dental care decisions for their children through a life course approach and to find themes that explain underutilization of free dental services by low-income parents.

An action research study design in qualitative research conducts research in collaboration to generate action (MacDonald 2012). The methodology of action research fosters collaboration among participants and researchers and promotes capacity development and capacity building in all participants (MacDonald 2012).

Last, a grounded theory approach is a qualitative study design that uses a systematic set of procedures to develop a theory about phenomena (Lawrence and Tar 2013). It is used to develop a theory in a field where little research has been conducted.

3.3. Sampling in qualitative research

In qualitative studies, non-probability (purposive) sampling is usually selected in a strategic way based on the study's research questions (Llewellyn et al. 2004). Purposive sampling is usually based on the criteria chosen by the research team. Several types of purposive sampling methods can be used, such as maximum variation, extreme, typical case, critical case, criterion, snowball, theoretical, or concept sampling and opportunistic sampling method (Maestripieri et al. 2019). However, using purposive sampling can result in a risk of bias because there will be an element of self-selection in research based on qualitative sampling (Lyon 2015).

When selecting subjects in qualitative studies, the researcher needs to consider certain points, such as selecting participants who are knowledgeable about the research topic, able to represent a range of viewpoints, and willing to partic-

ipate (Maestripieri et al., 2019). Sample size requirements for qualitative research are not based on statistical sample calculations but on thematic saturation (Morse 2000). Data gathering and analysis are conducted concurrently and recruitment continues until no new themes or relevant data emerges from data gathering (Moser and Korstjens 2018). Several factors can influence the sample size of qualitative studies, such as the nature and scope of the study, study design, heterogeneity of the population, quality of data, and types of data collection methods used (Morse 2000).

3.4. Analysis of qualitative data

Qualitative data analysis is usually inductive and concurrent, and usually begins after the first interview. Multiple coders are used to ensure credibility (Sinkovics and Alfoldi 2012) and newly collected data are usually compared to existing data. Several types of data analysis methods are used, including content analysis, framework analysis, and thematic analysis (Vaismoradi et al. 2016).

Several software packages can be used to manage the analysis of qualitative data such as NVivo (Zamawe 2015) and computer-assisted qualitative data analysis software (CAQDAS) (Wickham and Woods 2005). The transformation of hundreds of pages of interview transcriptions and field notes into a final report is considered a key challenge of qualitative data analysis. Thus, appropriate software helps to manage the themes and the coding of the data, as the researcher must always remain in control.

When writing the final report, quotes should be representative, succinct, and illustrative (Lingard 2019). Power quotes are the most compelling quotes derived from the data. It is always better to provide multiple quotes for each theme as a proof and quotes are not expected to be presented in isolation but should be explained as a narrative (Braun and Clarke 2012).

3.5. Social factors affecting oral health in children

Understanding social factors affecting oral health in pediatric dentistry specialty can help researchers to conduct new research ideas involving qualitative design or mixed methods design. Healthy child development is largely influenced by parent-child interaction in which parents provide their children with the experiences that they need for achieving their developmental milestones (De Falco et al. 2014). Children's social

emotional as well as cognitive adaptation beyond infancy is influenced by secure parent–child attachment (Dexter et al. 2013). The dynamic system that evolves in the function and structure is defined as the family (Duijster et al. 2014).

The warmth that parents bring to their children starts in infancy. When the child grows up they will be bonded directly to their parents (Steinberg 2001). The parent–child relationship is called an attachment relationship (Broberg 2000). Usually children are attached to family connections and are particularly close to their mothers (McAuley et al. 2012). The family environment is an important factor that mediates the relationship between social conditions and oral health (Duijster et al., 2014).

It is important to pay attention to the whole family in addition to the child’s dental health (Mattila et al. 2000). Parents’ own oral health behavior is another important factor that can affect dental health in children (Skeie et al. 2006). Moreover, parental stress, maternal depression, and over-indulgent parents can negatively affect children’s oral health (LaValle et al. 2000). In addition, parents’ education and socioeconomic level are related to the caries experience of their children (Mattila et al., 2000).

3.6. Using qualitative methods in pediatric dentistry

Qualitative studies in pediatric dentistry are used to explore the perceptions of mothers and their children and to under-

stand their behavior in different areas related to pediatric dentistry, including behavior management techniques, traumatic dental injuries, dietary behaviors, early childhood caries, using fluoride therapy, treatment of children with special health needs, anesthesia, tele-dentistry, dental fear, and anxiety.

Recently, a qualitative study described the perceptions of mothers, psychologists, and pediatric dentists regarding the use of protective stabilization in the dental care of children up to the age of three, and found that protective stabilization generated emotional discomfort but was well accepted by all groups (Ilha et al. 2021). Another study qualitatively examined parental and dentist reports of successful strategies implemented during dental care with children with autism spectrum disorder (ASD) (Stein Duker et al. 2019). Their findings provide insights into techniques perceived by parents and dental providers to treat patients with ASD effectively (Table 2).

Mixed methods study design is a research design that combines, collects, and analyzes data using both quantitative and qualitative methods in a single study (Creswell and Tashakkori 2007). In health research, mixed methods design is used to triangulate the results of different methods, using the results of one method to develop the other method, and thereby discovering new perspectives and expansion of enquiry using different methods (O’Cathain et al. 2007).

Several studies have implemented mixed methods design or qualitative methods in pediatric dentistry research (Baghlaf et al., 2020; Lotto et al., 2020; Suprabha et al., 2021;

Table 2 Example of recent qualitative studies in pediatric dentistry field.

Study	Aim of the study	Data collection	Number of participants	Type of analysis
(Stein Duker et al., 2019)	To qualitatively explore parental and dentist reports of successful strategies implemented during dental care with children with autism spectrum disorder	Focus groups were conducted with parents and dentists	Two focus groups with parents and two with dentists	Thematic analysis approach.
(Baghlaf et al., 2020)	To investigate the relationships between children’s food and drink choices at school lunch for children who consume high and low sugar intakes at home	Mixed methods design involving qualitative observations	Thirty-nine children were observed during school lunch	Conventional content analysis
(Taormina et al., 2020)	To understand the reasons behind this behavior and to identify the different barriers to the implementation of adequate preventive measures.	Semi-structured interviews	Fifteen parents	Thematic analysis
(Lotto et al., 2020)	To determine perspectives of parents and caregivers of preschoolers regarding early childhood caries (ECC)	Focus groups with parents	Three focus groups with attendees of the Clinics of Pediatric Dentistry	Content analysis
(Aarvik et al. 2021)	To explore the perspectives of non-specialist dentists on the use of restraint in pediatric dentistry	Two focus group interviews	Two focus group interviews involving four and five dentists, respectively	Thematic analysis
(Ilha et al., 2021)	To describe the perceptions of mothers, psychologists, and pediatric dentists regarding the use of protective stabilization	Qualitative interviews	Five mothers, seven psychologists, and four pediatric dentists	Content analysis
(Marty et al. 2021)	To evaluate the perception of dentists using protective stabilization for dental care in children.	Semi-structured qualitative interviews	Twelve dentists were interviewed	Thematic analysis
(Malik et al. 2021)	To understand how parents or caregivers experienced physical constraint and the use of the papoose board on their children during regular dental treatment.	In-depth interviews	Seven parents	Thematic analysis
(Suprabha et al., 2021)	To explore and understand the perceptions and challenges faced by the parents of the children with ECC in performing routine oral hygiene practices for their children.	Focus groups with parents	Five focus groups	Content analysis

Taormina et al., 2020). The research topics included parental perception in relation to oral hygiene measure, dental fear, dental anxiety, dietary factors related to dental diseases, oral health promotions, and parental perceptions of advanced behavior management techniques (Table 2).

There is sufficient need for a greater engagement with qualitative research methods as a part of the curriculum in pediatric dentistry education, to handle several psychological or behavioral multifactorial conditions with greater success, such as dental fear and anxiety (Margaritis et al., 2012).

3.7. Collecting qualitative data from parents

Table 2 shows examples of recent qualitative research in pediatric dentistry with different methods. Most studies collected data from parents because parents are responsible for establishing good oral-health behaviors in their children, such as establishing and supervising tooth brushing, and establishing a positive relationship with dental professionals (Hooley et al., 2012). For example, tooth brushing is usually assisted and controlled by parents particularly when their children are young. Parental supervision during tooth brushing is associated with lower caries in children (Narksawat et al. 2011).

A child's dental attendance for oral hygiene measures at a pediatric clinic is also dependent on their parents. Usually children who have a history of missed dental appointments are likely to have a higher rate of caries (Wigen et al. 2009). Parents' education level is important because a lack of oral health knowledge—for example, a poor knowledge about fluoride—can also be associated with poor oral health in children (Hooley et al., 2012).

Moreover, parental attitude toward children's oral health is significantly associated with understanding the importance of developing oral hygiene skills in their children (Vanagas et al. 2009). Parents' self-belief to ensure that their children brush their teeth twice a day also predicts oral hygiene behavior (Vanagas et al., 2009).

3.8. Collecting qualitative data from children

Little is known about effective interview techniques with children while qualitative researchers have clear methods to guide them in collecting data from adult participants (Spratling et al. 2012). Additionally, there is still insufficient knowledge regarding the credibility of using children as a source to collect data in qualitative research. Like actors, good qualitative researchers use tried and tested methods to anticipate and manage the unpredictability of children (MacDougall and Darbyshire 2018). As children grow up, they spend more time with their peers and nonfamily adults. They gain a greater understanding of the world outside of their immediate family (Larson et al. 2002).

Methods that are usually used in qualitative research with children are focused interviews, focus group discussions, and participant observation (Gill and Baillie 2018). Other methods have also been used to explore children's views, including the "story crafting" approach (Hohti and Karlsson 2014) and photographic prompts during focus group discussion (Briggs and Lake 2011). The story craft technique is an ethnographic narrative approach to explore children's perspectives through storytelling and reflexive listening. Briggs and Lake (2011) asked

children to take photographs to record their food intake and food environment over four days. These photographs were later utilized and discussed in focus group discussions. A methodological study investigated qualitative data collection with children; their findings indicated that children are able to articulate their experiences in interviews (Spratling et al., 2012). However, there are some barriers to using qualitative studies in children.

4. Discussion

Credibility in qualitative research is a key factor in establishing the trustworthiness of a research methodology. Credibility is defined as results that are believable and that can be trusted. It is considered a primary criterion for the synthesis of validity in qualitative research (Whittemore et al. 2001).

First, even though studies have shown that children have the cognitive ability to articulate their own ideas by the age of five (Hurley 2005), some children may have a range of communication and cognitive abilities. According to Piaget's theory, children aged four to 11 years are the most challenging to involve in a conversation because of the stage of their linguistic development. It is the responsibility of the researcher to modify the topic guide based on children's age group. The questions in the topic guide should be compatible with their individual linguistic and cognitive stage (Kortelnuoma et al. 2003, Piaget 2003), because some children can be verbose while others will not be able to respond to questions or provided tangential answers. Children who are not able to answer, are not able to make a linguistic connection that demonstrates significant factors influencing the research question and not incidental observations. One cannot be sure that any differences in the factors identified by children are due to the individual cognitive and linguistic abilities of the child or if they are actual differences.

Second, using focus groups in children rather than one-to-one interviews may impact children's ability to converse. Primary school children can voice their opinions when they hear others and their memories may be prompted by the contributions of their peers (Hill et al. 1996, Darbyshire et al. 2005). However, it is not known if the focus group environment exerts peer influences. Another barrier to using qualitative methods with young children is personality differences that influence children's behavior during focus group discussions (Gibson 2012). Some children will be interactive while some will be shy and less willing to participate. Social and psychological development plays an important role in facilitating communication competence during children's school-going years (Koegel and Koegel 2006).

Researchers also know when and how to step back, allowing the children's experiences to take their rightful place on the qualitative stage (MacDougall and Darbyshire 2018). Reflexivity is the notion that the researcher is the research instrument. Reflexivity involves the interviewer and researcher reflecting on their own perspectives and potential biases during an interview or analysis. Self-reflexivity with children allows researchers to recognize explicitly and acknowledge their preconceptions (Pezalla et al. 2012). In qualitative studies there is also a process named bracketing, which is defined as "a method used in qualitative research to mitigate the potentially deleterious effects of preconceptions that may taint the

research process” (Tufford and Newman 2012). For example, if a researcher is conducting research but is also the mother of school-going children, she may have subconscious biases and perceptions about parenting. This could impact the management of focus groups with children who often give divergent responses to questions.

This review summarized the most important information needed for a pediatric dentist before conducting a qualitative study; however, there is no research without limitations. This literature review used a search strategy, but it lacks appropriate critical appraisal of included studies. Future studies are needed to investigate effective interview techniques with children and more research should be conducted to evaluate the credibility and trustfulness of using children as a source to collect data in qualitative research.

5. Conclusion

Research in pediatric dentistry is predominantly quantitative in nature. The use of qualitative research methods is usually based on the research aims and the type of research questions. A qualitative study design can be used in pediatric dentistry to explore the perceptions of mothers and children and to understand their behavior in different areas. However, little is known about conducting qualitative research with children due to barriers related to credibility, the influence of others on children’s opinions, and differences that influence children’s behavior during focus group discussions.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Khlood Baghlah reports administrative support was provided by King Abdulaziz University. Khlood Baghlah reports a relationship with King Abdulaziz University that includes: non-financial support.

Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.sdentj.2022.11.012>.

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