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Why Parents Refuse General Anesthesia for Their Children: A Qualitative Exploration

by
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THESIS
Submitted in partial satisfaction of the requirements for degree of
MASTER OF SCIENCE

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Oral and Craniofacial Sciences

in the

GRADUATE DIVISION
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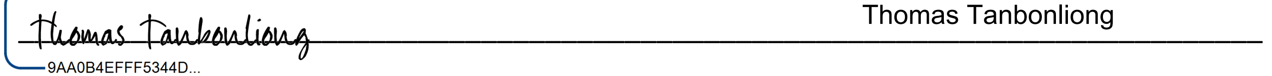

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ABSTRACT

Why Parents Refuse General Anesthesia for Their Children: A Qualitative Exploration

Michelle Tsao

The main purpose of this qualitative study conducted at University of California San Francisco (UCSF) Pediatric Dentistry is to understand the reasons why parents refuse general anesthesia (GA) as a modality to deliver dental treatment to their children. Secondly, due to the multi-cultural backgrounds of the patients seen at UCSF, the study also aims to identify and compare whether concerns regarding GA differ from one family to another due to differences in their racial or ethnic backgrounds.

A total of twenty caregivers agreed to participate in the study. Ultimately, eleven caregivers complete the phone interviews and nine did now show up to their designated interview times and did not respond to rescheduling requests. The interviews ranged from twenty to forty-five minutes long and were conducted through Zoom. Two researchers conducted the interview either in English or Spanish. Each interview was recorded, translated into English, transcribed, and analyzed using Dedoose software.

The reasons caregivers refused GA for their children are: Fear of Medical Risk (Main factor), Media Influence, Family/Friend Influence, and Child's Age. These reasons were the same across culture, background, age, and education level of participating parents. Healthcare providers seeking to guide parents on picking the best modality to complete dental treatment are advised to proactively talk to guardians about their fears and concerns around GA and be

prepared to provide additional information and education on those topics, and support guardians through the decision-making process.

Keywords: Pediatric Dentistry, Behavior Management, General Anesthesia, Parental Consent, Early Childhood Caries

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Introduction

Early childhood caries is a global healthcare concern with negative psychosocial effects on children and their families and is one of the most common causes for hospital admissions in children[1]. According to the Centers for Disease Control and Prevention (CDC), approximately 37% of US children between the ages of 2-8 had caries in their primary teeth. In the 2-5 age group, dental caries rate was almost 23% and in the 6-8, that number rises to 56%[2]. Furthermore, dental pain can cause; severe interruption in the homelife, children to miss school, and parents to miss work. Based on 1989 NHIS data conducted by Gift et al, an estimated 51 million school hours are lost every year due to dental-related issues.[3]

Nearly 1 in 4 children seen by pediatric dentists present with behavior management difficulties[4], making treatment of dental caries challenging. Meanwhile, studies show cooperative behavior of pediatric patients has worsened over the past few decades[5], possibly reflecting fewer boundaries, less discipline and self-control, and lowered behavior expectations by parents and contemporary culture[6]. A wide array of dental treatments and behavioral management techniques are available to pediatric dental providers ranging from the least invasive tell-show-do and positive reinforcement, to the use of protective stabilization and pharmacological interventions such as minimal or moderate sedation, to the advanced pharmacological intervention of general anesthesia (GA). Providers strive to use the least invasive behavior management technique possible to complete the required treatment, but GA is indicated in certain cases.

Dental treatment completed under GA is recommended due to a variety of reasons, including but not limited to extent of dental treatment needed, failure of other behavioral guidance modalities, severe anxiety, and significant degree of non-cooperation due to lack of psychological or emotional maturity, and/or mental, physical, or medical disability. Studies show that parents are generally extremely satisfied, and report improved quality of life after their children undergo dental rehabilitation under GA[7]. Dental treatment under GA in the United Sates can take place in three different settings –a hospital, an outpatient surgical center, or a dental office with anesthesia to be administered by a traveling anesthesiologist. Safety and complication rates vary by setting type, but GA in a hospital setting is widely considered as a safe and effective option by medical and dental professionals[8]. A 10-year review of 22,615 medical records of 376 hospitals by American Hospital Associated reported zero deaths in cases involving dental care under GA for children 1-6 years of age between 1987 and 1997 in the United States in a hospital setting.[9] Although, post-operative morbidity is common, its severity is typically mild and limited to the first few days after surgery. These morbidities include inability to eat, sleepiness, pain, bleeding, sore throat, nausea, coughing, and fever. Despite this, not all parents consent to general anesthesia for dental treatment for their children. Risks and consequences of not treating dental caries include pain, infection, destruction of teeth and bones, trouble with speaking, eating, and sleeping, and in rare cases even death.

Death from general anesthetics is a cause for concern to all parents, although fatalities have steadily declined over the past several decades[10]. News reports of deaths during dental procedures make headlines in the news, but most, if not all cases did not take place at a hospital. In fact, many of these reports involve oral conscious sedation rather than GA, which involves

taking a oral medications to induce a sedative effect, was administered by the dentist or his/her staff members rather than an anesthesiologist, and takes place in a dental office setting instead of the hospital.

Besides understanding the safety of behavior management techniques, parental acceptance and consent is also an essential component before pediatric dentists implement behavior management techniques and medical/dental procedures. Parental acceptance of different behavior management techniques (BMT) varies from one family to another and is different for different techniques. In general, parental acceptance is a continuum where least invasive, and communication based techniques are most accepted[11]. Studies have shown parents from different ethnic groups express different preferences for BMTs with tell-show-do being universally one of the most accepted communication based BMT's across different cultures[12]. More aggressive techniques are viewed as those involving restraint or pharmacological intervention and are often rated as less acceptable to caregivers[13]. Acceptance of different behavior management techniques has been shown to be related to factors such as: previous parental experience with a particular technique, pain or urgency of treatment, amount of treatment needed, thorough explanation of proposed techniques, and out-of-pocket costs[14]. While this is the case, few studies have explored the reasons for these preferences and whether they vary across cultures.

The purpose of this study is to examine the reasons why parents of pediatric patients with extensive dental needs (3 or more quadrants of dental caries) declined to use general anesthesia for completion of dental treatment. The two research questions we aim to answer are: 1) Why do parents of children with extensive dental needs refuse dental treatment performed under

general anesthesia for their children? and 2) Do parents of different racial/ethnic backgrounds have different reasons for declining general anesthesia?

Understanding these two core questions could increase providers' ability to provide culturally sensitive care, build trust and enhance communication between the healthcare team and patients and their caregivers, and increase the acceptance of GA treatment when indicated, thus enabling children to obtain necessary dental care.

Materials and Methods

This qualitative study was approved by the institutional Review Board of University of California, San Francisco (UCSF Study #-20-31646).

Study Population

Parents of patient's who declined to have dental treatment completed under general anesthesia or initially declined but later ended up going through with treatment under GA were invited to participate in the study if they met the following inclusion criteria:

- Patients of record and who were seen at least once in the dental clinic at the UCSF pediatric dentistry department from January 2019 through December 2021.
- Healthy or well-controlled systemic disease (ASA I/II)

- Recommended to receive dental treatment under general anesthesia at UCSF Mission Bay Benioff Children's Hospital by a UCSF Pediatric Dentistry Resident/Faculty
- GA was refused by parent/primary caregiver
- Caregiver Speaks English or Spanish
- 3 or more quadrants of dental treatment needed (due to extensive dental caries and/or infection)
- Age 7 or less at time of GA recommendation

Exclusion Criteria:

- Patients ASA III or higher
- Patient ages 8 and over at time of GA recommendation
- Under 3 quadrants of dental treatment needed

Instrument Development

Two interviewers used a semi-structured interview guide to conduct an interview with ten standardized questions accompanied by flexible prompting to help guide participants into describing more detail. The interview guide was written originally in English, then translated into Spanish to ensure uniformity in overall structure of the interview. One researcher conducted interviews in English and one in Spanish.

The ten questions were designed to be direct and open-ended to encourage interviewees to delve broadly and deeply into their thought processes. We aimed to cover a

range of topics surrounding medical and dental experiences that may be directly or indirectly influential on comfort levels with GA. For example, we inquired about parental dental and medical experiences, the level of trust parents had in the dentist in comparison with other medical healthcare providers, in what situations parents would feel comfortable with general anesthesia, and so on. When parents stated reasons why GA was declined, we always asked for elaboration and expansion. Follow-up questions aimed to get to the root of their explanations and reasoning. As a baseline, parents were asked to describe their child's dental health and dental experiences leading up to the appointment where GA was recommended. Questions include: "Tell me about your experiences taking your child to the dentist" and "what are your greatest concerns about putting your child under GA". Please see Table 2 for the full list of questions.

Patient and caregiver demographics were collected from chart review or a short questionnaire recorded at the end of each interview and are listed in Table 3 in List of Tables section. This information allowed us to compare between patient and caregiver background.

Data Collection

Electronic dental record charts (Axium) from January 2019 through December 2021 were reviewed to identify patients who met the inclusion criteria. Identified patients also had to meet all inclusion criteria as listed above. Participants who did not meet the inclusion criteria were excluded. All participants were given an e-gift card from Amazon or Target valued at $30 upon completion of the interview.

The interviews were conducted through video chat. Nine participants agreed to participate in the initial screening phone call but did not show up to their scheduled interview time and did not respond to requests for rescheduling. Participants gave verbal consent to have their responses audio recorded. The consent and interview questions are presented in Tables 1 and 2 respectively.

Data Analysis

Interviews were recorded, translated into the English language if the interview was conducted in Spanish, and transcribed. All transcriptions were cleaned for accuracy and to remove identifying information, then entered in the Dedoose software. Demographic data was also recorded in an Excel spreadsheet and analyzed for descriptive statistics. Interviewees were de-identified and assigned a participant number, followed by the letter "E" or "S" to signify the language their interview was conducted in. All transcripts were read through several times and a list of themes were identified based on recurring patterns discussed by study participants. Each of the codes developed were co-coded as either "Barriers" or "Facilitators" to indicate whether it acted as a barrier or a facilitator in the parental decision to obtain dental treatment under GA. All transcripts were fully coded and were analyzed in the Dedoose software through thematic coding then tabulation of code frequency. All findings are described in the results section below.

RESULTS

156 primary caregivers were identified as meeting the study inclusion criteria through the chart review and were telephone called to confirm eligibility. Each potential participant was contacted by phone, and was contacted up to two times if the potential participant was not reached on the first attempt. A voicemail with brief information about the study and a call-back number was given to the parent on the second try. Those who met the inclusion criteria were invited to participate in the research study. Forty-three parents could not be reached and did not respond to our voicemails. Many parents (58) did not feel they had refused GA and comprised two types: 39 parents denied having hesitations about general anesthesia, but have not yet returned the history and physical form needed to schedule a GA appointment, and 19 caregivers wanted GA but did not have the forms or information needed to move forward with scheduling. Fourteen caregivers did not meet the language requirement of speaking either English or Spanish, 12 parents wanted dental treatment sooner and had their work completed at another facility, 9 parents declined to participate in the interview although meeting all inclusion criteria.

A total of twenty caregivers agreed to participate in the study in the initial screening phone call. Eleven of those caregivers followed through to complete the phone interviews: 9 English, 2 Spanish. Interviews were completed until saturation. Nine other potential participants agreed to participate in the initial screening phone call but did not show up to their scheduled interview time and did not respond to follow up requests to reschedule their interview. Interview length ranged from twenty to forty-five minutes and transcripts were then

coded in Dedoose. Coding was completed by identifying common themes across all interviews and labeling them as individual codes.

The final list of codes is presented in Table 4. Those mentioned most frequently by caregivers and became a main theme in the final data analysis are marked with “Y” in the chart. All findings associated with each code will be presented in the “Results” section.

All participants were mothers of the patient and attended the initial dentist visit with their child. Study participants spoke either English or Spanish as a primary language, and were diverse in their race, background, country of origin, profession, education level, and age. Parent and child demographics are captured on Table 3.

Despite having a diverse group of parents, there were many commonalities among their responses. First and foremost, all parents reported that they valued primary teeth as “almost as” or equally important as permanent teeth. They acknowledged that although baby teeth will eventually exfoliate and be replaced by permanent teeth, the primary teeth “serve a purpose” such as holding the space for adult teeth, for speaking and eating. Additionally, all parents recognized that their child either had or is currently experiencing dental issues that were negatively impacting their lives, including the presence of pain, infection, issues with eating, sleeping and so on. The decision whether to put their child under general anesthesia was weighed heavily by all participants. All parents consulted family and friends, and most did their own online searches to find out more information about GA as a treatment option.

When it comes to the relationship with their dentists, all parents reported trusting their dentist often just as much as their pediatrician and/or an anesthesiologist. Many consulted

their child's pediatrician about the GA recommendation, and all the pediatricians were in support of the dentist's recommendation. Only one parents reported that she would trust the GA recommendation more if it came from her pediatrician than their dentist. The following quotes are extracts from individual interviews. Participants are identified by a unique participant number, followed by the letter "E" or "S" to signify the language their interview was conducted in.

> *"Interviewer: Do you trust the recommendation from the pediatric dentist who gave you the recommendation to have your child put under general anesthesia?*
>
> *Parent: Yes I do. Yes. Yes I do. Yeah.*
>
> *Interviewer: Do you think you would trust that more if the person giving the recommendation was your pediatrician or an anesthesiologist, for example, or are they all the same?*
>
> *Parent: I would say all like the same, because everybody has a knowledge about this, so I would say the same. " 8_E*

After the interview transcripts were coded and analyzed in Dedoose, four major themes emerged as the primary reasons why parents refused GA for their child. These reasons occurred most frequently and were reported by majority of caregivers.

1. Fear of Medical Risks / misunderstanding of GA
2. Media Influence
3. Family/friends influence
4. Age of child

Two themes emerged as though less often cited by parents, however if cited, was a main reason for GA denial.

5. Perceived alternatives to GA/Cultural perspective
6. Personal stories/Experiences – mostly neutral/positive, 2 negative

Fear of Medical Risk

The most cited main reason for refusing GA is fear of medical risk. All eleven parents stated they were afraid that their child “does not wake up” from GA. For these parents, despite trusting the healthcare team, they perceived the risk of their child dying from GA as greater than the need to have dental treatment.

> *“I wasn't worried about the actual procedure. I mean, I was at UCSF so I felt confident, but it was just more I didn't know how she was going to react, if she was not going to wake up, if it was going to stop... the stories like, "Their heart stopped from too much anesthesia or..." it was more about her not waking up.” 4_E*

> *“I know that the medical staff are maybe qualified for that. I don't have anything against, I trust their experience, their work. I don't trust just the procedure, I trust the doctors, but the procedure, because it has a high... For me, it has high risk. I know maybe it's not the same and everything, but I don't want to take the risk just for a teeth.” 1_E*

> *“And I've read about a couple of cases where the child has died and I would rather he lose his teeth than go through general anesthesia.” 2_E*

Most of these parents also reported feeling uncomfortable with their lack of knowledge about GA. Some stated they felt providers did not explain it thoroughly enough, possibly contributing to misunderstandings about GA itself. For example, one mother thought the

anesthetics would be administered through the spine, rather through inhaled induction, intubation and intra-venous line as is typical at UCSF Benioff Children's hospital.

> *"I just want to come clear because I keep on talking about it. That general anesthesia will be injected through his spine... Is it true?" 5_E1*

> *Interviewer: So, did you feel like they did a good job of explaining what general anesthesia would mean or what that is?*
>
> *Parent: I don't think so. I don't think so, no. Another big concern is that, who is administering the anesthesia? Is it the dentist or is it a person with a degree in administering anesthesia? And yeah, just the risks of anesthesia, the risks of general anesthesia, it's a huge concern for me and expertise of the person doing it. 2_E*

> *"I'm afraid the doctor will overdose. That's the first concern and again it's just that I don't even know who's the doctor. I don't get to talk to them and they don't really get to know my child until the day of. So I'm not comfortable with that. Yeah. And basically that's pretty much..." 9_E1*

Media Influence

A second major theme is media influence. Eight parents did their own research about general anesthesia using search engines such as Google and found numerous articles about child deaths while undergoing dental procedures. Most parents were not able to differentiate between the different settings (hospital versus in-office), the type of sedation (oral sedation versus IV sedation), sedation level (moderate, deep, or general anesthesia), and the persons administering the sedation medication (dentist/anesthesiologist/other).

> *"Well, the first thing anybody does, of course, gets on Google, and I read so much horror stories of kids going in for dental and not waking up from anesthesia. And so at that point, I was just like, 'No.'" 4_E*

"I also heard about a case, but that wasn't just anesthesia. I heard on the news that at Oakland, where I used to take my children, there was also a case of a child who was taken there, they gave him a juice or something with anesthesia and the child died. And I haven't wanted to take my children to that clinic since then either." 10_S

Parent: I heard a lot about the GA effects in China. When the baby go to the dentist and then if they got the GA, the baby did not wake up. So I scared about the GA.
Interviewer: Where did you hear about these experiences?
Parent: In China? I saw the news in the Chinese 6_E

"I went on Google and I do a lot of research that say that they give you a lot of instructions, how it's going to go and everything and what the consequences to do it…But we do research before and I believe that thing gave me dramatic on my mind because I'm so scared for reading and everything. But I do it research on Google, mostly." 8_E

There was only one parent who discovered that the articles she was reading online about child deaths during dental procedures occurred in the dental office and not in the hospital setting. She stated that once she made this realization, she felt more comfortable putting her child to sleep under GA at the hospital.

"Well, basically, it was just I would type in 'children under anesthesia,' and you had... this girl died in the chair while her mom was in the waiting room. This is not... I kind of started to realize that the articles that I was reading was about, basically, people doing anesthesia in an actual dental chair rather than in a hospital like how we did it. And so there was a lot of positives as well online in the articles. And once I realized what was happening was happening in a dental office rather the hospital, that's when I decided to do it [GA]." 4_E

Family and Friends

Family and friends played a significant role in shaping the decision to deny or accept GA. Ten families cited seeking input from their social network and were greatly influenced by their perspectives.

Eight families had friends or family who advised them against GA.

"I remember I had told a few of my coworkers, what had to happen with my daughter, and then the following week, it was like, these articles started coming up, and they're like, oh my God, did you see this? That's so scary. This is something that's happening. It's definitely a conversation that came up a lot" 7_E

There was one mother that cited the pressure from family not to go through with GA was so great that even when she finally changed her mind to go through with the surgery, she chose not to tell anyone until the week of the procedure.

"But his dad, it was mostly him. His dad didn't feel comfortable. I also do believe influences around us, like my parents and then his family. We didn't tell anyone until the week of…I just didn't want ... not the pressure, but I just didn't want anyone to ... I was at peace from the beginning." 3_E

For parents who received encouragement supporting GA from family or friends, the support helped them become more comfortable or even became the deciding factor to agree to GA.

"I talked to my mom mostly and she said that we're going to be praying for him and everything is going to be okay. And it is something he's going to be fine for him. So you have to do it. She wasn't concerned. She was just saying it was better we do it, that way he's not complaining anymore with his pain." 8_E

"But until one of his friends was like, 'Well, it's going to be worse for him later on if you don't do it.' That's when he realized, okay well, somebody already went through this that he knows close of, from his childhood friends. They did the same thing with his child, so he felt like, "Okay, you're right." I pushed it. And then, of course, the doctor told him, but he still didn't feel comfortable until, I guess, he was out with his friends and he brought it up. And then one of his friends explained it to him basically and was like, "You do need to get it done because it's going to be worse. And the more you wait ..." Someone that had already went through it, so he was comfortable. Then he was like, "Okay. I trust you. I'm going to do this." Even though you could tell he was not a fan of it." 3_E

Another frequently mentioned theme was child's young age. Five parents stated in their interviews that they would feel more comfortable with GA if their child was older or "bigger".

For most, age was not the main reason for denying GA, but was another reason that held them back. Others hoped that by delaying treatment for a few more years, their child may be able to tolerate dental treatment in the regular dental chair and avoid GA altogether.

> *"I'll see when he's a little bit older, his body is a little bit more bigger or a little older." 9_E*

> *"We hear a lot of negative feedback because I mean [child's name] is still young, only five years old...So yeah, we held back on doing that procedure because we really think that it's too young for him and we're just not comfortable." 9_E*

There were two important themes that, though not as frequently mentioned as the previous themes, weighed heavily as a main consideration not to go through with GA if cited.

1. Perceived alternatives to GA, which is tied to cultural reasons for denying GA
2. Personal stories

For three families, GA was not perceived to be absolutely necessary to treat their child's dental concerns mainly because unlike surgery to address issues with internal organs, the teeth were accessible through opening the mouth without the need for cutting into the body, which they felt required general anesthesia.

> *"For surgery, it's a risk. When you have to take this risk, there is no choice. They cannot open your body when you are wake up. I understand that. But if something is outside, you can take care of it without the... I don't know why not. It seems like you just agreed to make it easy and just send the kids with the general anesthesia. For me, I don't agree." 1_E*

> *"My husband didn't want to, he didn't want to, he said no, that there should be another way of doing the treatment." 10_S*

"So, my greatest concerns, one is that it was probably not necessary, it may be done to make it easier but it may not be absolutely necessary and it's still used." 2_E

The same parents cited different cultural perspectives as a reason for their view that alternative options to GA should be pursued. Two families reported that dental treatment was not completed under general anesthesia in the country they grew up in and increased their uneasiness, knowing children living in other countries were able to have their dental treatment completed without GA.

"It doesn't make sense for me because I see in other countries, they do it without that. Like everywhere, they do it without the general anesthesia. I know here, they want to do it, but if the parents agree, that's okay. But if the parents doesn't agree, why you put the kid in a situation where he going to get infections, we'll take him and will get infection, and then, put the parents in just this is the only choice. That doesn't make sense. Maybe it's cultural." 1_E

"Having grown up in India, I was never subjected to it for dental work as even I had a lot of dental work as a child myself. Over here, I heard that general anesthesia is given more. It's okay for dentists to administer it. In India, they don't use it at all for children. I don't know if it's also legally not allowed, but definitely a culture thing and it's just not an option in India to give it to kids. They just do it without." 2_E

Personal Stories and Experiences

Personal Stories and experiences were shared by all eleven parents, however most had neutral or positive experiences with the hospital and/or general anesthesia such as the two quotes below.

Interviewer: Have you personally had experiences with general anesthesia for yourself?
Speaker 2: Nothing negative. I've been under surgery a few times after a car accident, but I've never had any issues. 4_E

"Do you or your family members have personal experiences with general anesthesia?

Speaker 1: Yes, I do. My experience has always been good. I've had multiple surgeries in the United States and India, and it's been good both times." 2_E

There were 2 parents who reported having a personal negative medical experience as the main contributing factors to their opposition to dental care under GA.

"Told you I don't agree to do for my kid a general anesthesia, because personally, I had really bad experience with that." 1_E

Finally, in examining the group of three parents who initially refused GA but ultimately agreed, all cited having a difficult time watching their child suffer from exacerbating pain as a main factor for ultimately accepting GA.

"The pain was becoming excessive. The pain, and I know infection can run through the blood, so when I started reading that, I was just like, 'We've got to do this.'" 4_E

"I don't want him [her child] to be in pain anymore because it was so hard seeing him at night crying so bad about his pain. And I thought his teeth were going to come out, that one, but he didn't. So they took another ones out. So he is happy right now, even though he smile without his two teeth, but I'm happy. He doesn't concern anymore." 8_E

All three families were happy with their decision to put their child under GA and would do it again if in the same situation.

"I would do it again. She [child] didn't want to go through with it. Of course, she was freaking out, and they did give her something to calm her down beforehand which helped a lot... I mean, it was not a bad experience whatsoever, and I would do it again if it was to repeat itself, of course." 4_E

Upon understanding parents' reasons for refusing GA, we sought a model or framework that could link the reasons to the behavior in a systematic way. The Health Belief Model is one of the most widely applied theories of health behavior. The theory proposes that an individual's health perceptions are the determinants to health-related behaviors, which can also be applied to this study's findings. The six domains of the health belief model are:

1. Perceived Severity
2. Perceived Benefits
3. Perceived Barriers
4. Perceived Susceptibility
5. Cues to Action
6. Self-Efficacy

The Health Belief Model can be used to explain parental decision surrounding general anesthesia. As such, we can also use this model to understand and predict individual decisions in health behaviors, as well as provide a guide for designing interventions or strategies to communicate with parents. Please refer to Table 5.

DISCUSSION

Previous studies have shown that parents from different ethnic groups have different preferences for behavior management techniques. In a 2019 Mier et al study[15], researchers found Hispanic parents to be least accepting of general anesthesia, parents from the Middle East and Non-Hispanic White parents are moderately accepting, and non-Hispanic Black parents and Parents in the US are most accepting of GA. In comparison to our study, we found these trends reflected in the participants recruited, with the highest percentage of parents identifying as Hispanic at 46%, 36% Asian and 18% Middle Eastern. No participants identified as White or Black.

In a qualitative study by Wong et al[16] similar to this study design, Wong's research focused on attitudes of Chinese Parents living in New York City towards oral health, sedation, and GA. Similar to our study, they found fear of anesthesia and its adverse effects, as well as opposition from social support systems to be barriers to GA. Facilitators to GA similar to our findings, including trust in the providers and satisfaction with outcomes of treatment. What is different however, is that in our interviews, parents reported that primary teeth were of similar or equal importance to permanent teeth, whereas the parents in the Wong study reported parents lacked their own dental education, knowledge of oral hygiene, and had a culture that did not support preservation of the primary dentition.

What is most unique about our study is the diversity of participants. Not only were participants varied in their race and ethnic background, but they also varied in age, profession, and education level. In this multi-cultural population, we discovered more similarities than

differences in how parents perceived dental treatment under GA. However, some parents lived in other countries in which GA is less likely to be recommended as an option to complete dental treatment prior to moving to the US and cited “cultural differences” as a reason why they do not see eye to eye with their dental providers on the necessity of GA.

There are several limitations to this study. First, all participants were recruited from a university dental clinic setting, limiting its generalizability to children who access other kinds of clinics such as private practices and offices that do not have post-graduate dental residents as providers. All children included in the study were ensured by Medi-Cal Dental (California’s Medicaid program), which covers cost of the dental treatment under entirely. This coverage is generally more generous than what is covered in private dental plans or for those who have no dental insurance at all. Because of this, private practitioner dentists also have the added barrier of cost when it comes to recommending GA. Secondly, the small, self-selected group of participants (*n*=11) means that we may only generalize to limited populations and would benefit from a future study with a larger sample size. Though starting off with a list of 92 potential participants, only 11 complete an interview. Despite the small sample size, we were still able to successfully identify recurring themes in a very diverse population of patients and draw parallels with previously published studies. This suggests parental concerns of GA for dental care may be widely shared across language, culture, and background.

Our results combined with The Health Belief Model offers guidance for intervention development for how dental providers should talk about GA with parents, including:

- Talking with parents to learn about and understand their concerns and hesitations about GA
- Providing informational counter points to perceived risk of GA by explaining the health risk to children of not undergoing GA and treating their severe dental disease
- Providing specific details about the exact procedure and how it has lower perceived risk than many of the stories portrayed in the media
- Communicating clearly to parents why the recommendation is treatment under GA; Highlighting the benefits to proceeding and addressing the risks involved
- Assisting and educating parents in identification and reduction of barriers to action, which includes providing support, resources, and tools to parents

In the section below, we aim to analyze each major theme by presenting and comparing to its related studies and data available, then offering recommendations for clinical practice incorporating elements from The Health Belief Model.

Fear of medical risk

Death from GA is one of the most greatly feared adverse outcomes for the general population and is extremely rare. In adults, the death rate is approximately 1 in 200,000[17] and the number is predicted to be lower for pediatric patients undergoing all medical procedures. Furthermore, the death rate is correlated with the medical status of the patient and the procedure. The sicker and more invasive the procedure, the higher the risks. Studies show that perioperative cardiac arrest and mortality are most seen during cardiac surgical procedures, in

patients with significant comorbidities, and in infants[17]. These conditions rarely apply to the mostly healthy population of children undergoing dental procedures under GA.

Clinical Practice Recommendation: In most cases, parents are more concerned about risks of GA for their children than the risk of surgery itself. Parent preparation for GA is key. This may include preoperative education that can be in the form of online modules or videos, books or print material, child life interventions (such as modeling or play therapy), and tour of the operating room facilities. It is important for dentists to become highly competent at providing details on GA if he/she is recommending it for dental care.

Reassure guardians that GA, particularly in healthy children, GA is extremely safe. Follow up with providing education around GA itself can include; introducing personnel involved, photographs, videos, or tours of the location of surgery, presenting the sophistication of equipment available for safety and monitoring, describing the process of helping the child "go to sleep" and so on. The more that can be done to minimize the unknowns and then allowing opportunities for follow up questions can all be helpful in reassuring parents.

Media Influence

When it comes to injury and most adverse events in the dental setting, there are no mandatory reporting or centralized tracking systems available in the Unites States.[18] Because of this, data on morbidity and mortality is not tracked or recorded, and therefore unable to be analyzed in a systematic way. The sources most publicly and easily available are media reports and lawsuits[19] , which offer imperfect or often inaccurate information and have risk of bias. Furthermore, parents are often unable to distinguish between the types of cases presented in

the media reports and the GA option being offered. For instance, few parents recognized a difference between oral conscious sedation (moderate sedation) versus GA, in-office versus hospital GA, and GA that was administered by a dentist versus an anesthesiologist.

In a review of media reports by Lee and Milgrom[20], researchers found that publicly available articles between 1980-2011 presented a skewed picture of GA for dental procedures as the data focuses on sedation rather than general anesthesia. Furthermore, media reported that most deaths occurred among 2–5-year-olds in an office setting and with a dentist (general or pediatric) as the anesthesia provider. This contrasts with the GA recommendation at UCSF which takes place at a children's hospital with GA administered by a medically trained pediatric anesthesiologist.

Clinical Practice Recommendation: While online search engines are a powerful tool in modern day society, dental providers must play a main role in helping parents understand the similarities and differences in the cases they are reading about in the news versus the actual treatment modality being recommended for their child. The first step is for pediatric dentists to acknowledge and anticipate that search engines will be consulted by parents. We should counsel patients on the fact that search results will overemphasize the few terrible cases, as no one is reporting on the many safe dental procedures occurring every day. Furthermore, adverse events in dentistry are more likely to refer to oral conscious sedation instead of general anesthesia, more commonly occurring in the dental office instead of a surgery center or hospital, and more likely to be administered by a dentist rather than an anesthesiologist. It is appropriate for providers to invite hesitant patients to do their own research and discuss their findings with the provider who can explain the differences between the media reports and

what is recommended for their child. Providers must then facilitate an open channel of discussion to allow parents to ask follow-up questions after they have completed their own data gathering and analysis.

Family/Friends

Social networks play an important role in shaping the decisions we make. A family member's negative personal medical experience or a co-workers news search on the internet often translates to well-meaning advice that becomes an additional barrier for parents who are already hesitant about consenting to GA for dental care for their child. However, this can also have the opposite effect where family and friends can become a strong support system that ultimately gives parents the extra encouragement needed to overcome their own uncertainties.

Clinical Practice Recommendation: Acknowledging that social influences are both inevitable and important factors for parental decision-making processes is key. It is recommended that providers invite not just the guardian bringing the child to the dental appointment, but whomever their primary partner(s) are that they will be discussing and making the final decision with into the conversations about GA. This allows the inclusion and equal participation of key decision-maker in the family. Whether in-person, or remotely, the guardians will be able to get first-hand medical and dental information from the providers themselves. Furthermore, it is recommend having print or video materials that can be accessible from home so guardians can learn, process, and arrive at decision in their own time.

The creation of education materials in the form of print or video that explains general anesthesia in layman's terms can help to establish a foundation from which to begin discussions. The education materials may include information such as:

- Anesthesia – who administers it? What is his/her background? What medications will be used and how will it be administered? What are the risks of GA and how will they be minimized?
- Safety – what are the monitors and safety precautions taken? Who will be monitoring and how often?
- Personnel - A "meet the team" section with general information regarding level of training of all main providers – dentists/anesthesiologists/nurses - who will be caring for the patient on the day of surgery
- Parent and child testimonials from families who have had treatment under GA and were satisfied with their outcomes, despite possible hesitation initially

Child's Age

In recent years, information on the effect of GA on the young developing brain has increased. Particularly for children under 3 years of age, repeated exposures to GA for procedures that last over three hours has increased risks associated and is best reserved for life-saving or emergent procedures[21]. While dental procedures completed under GA are not often repeated on healthy children under age 3 nor do they typically extend to 3 hours or more, dental providers are now cautious when recommending GA to any child under age 3. Instead,

providers may offer holding care options, such as silver diamine fluoride and ITR (Interim Therapeutic Restorations), or emergency extractions of abscessed or infected teeth on children under 3 years of age. The ages of the children in this study were between 4 and 7, and none fell below 3-years-old thus these increased risks were not discussed with the study participants.

Clinical Practice Recommendation: While some parents are truly concerned their children are too young to under GA, others may be holding on to the hope that their child may "outgrow" the dental needs or be able to tolerate in-chair treatment without general anesthesia in the near future.

For the parents concerned that their child is too young for GA and hope to wait until a certain age, it is best to emphasize that single, brief exposure to GA is no lasting effects on child's development. Inform parents that recent studies show that a single short exposure to GA is not likely to affect behavior or learning even in children under age 3. For example, a 2018 study[22] published in JAMA, Pediatrics (Journal of American Medical Association) which compared biological sibling pairs where one sibling received GA prior to primary school age to another who did not receive any GA showed no differences in development, nor increased risk of problems due to the GA exposure.

For parents who are hoping their child will outgrow the dental issues, emphasize the risks of waiting to treat dental infections, which include pain, suffering, and even death. Explore alternative methods of care with the parent and weigh those risks and benefits. For example, emergency extractions using a papoose for abscessed teeth can lead to long-term emotional and psychological trauma and a lifelong fear of dental and/or medical environments, not to

mention missed school and work due to pain and emergency dental visits, delays in growth due to inability to eat or sleep and so on.

Other Recommendations:

In clinical practice, providers are often met with time constraints in the clinical setting and are unable to touch on the broad range of topics that parents may have concerns about. One suggestion is to have knowledgeable providers/staff members in the role of "anesthesia educator" who can spend time with parents either in-person or virtually to discuss questions and concerns after the initial consultation appointment.

Incorporating motivational interviewing techniques into these conversations can also aid in creating an open environment where parents are more likely to share their genuine concerns, leading to more productive discussions about GA. The 4 pillars of MI include:

- Open-ended questions
- Affirmation
- Reflection
- Summary

It is up to us to dental providers to deliver appropriate education and to create an environment conducive to open and honest discussions about the risks and benefits of GA. Being thoughtful and respectful of people from different backgrounds or who hold alternative beliefs to our own can build trust and rapport between dentists and the families we take care of to ensure a positive outcome and experience.

CONCLUSION

Our study showed that although there are many factors that influence a parent's decision not to accept GA for their child, medical risk and the influence of media, family and friends were the reasons most often given by our study sample. Child's young age was frequently mentioned in about half the participants but is often not a leading reason for their refusal. Less widely held, but strong deterrents were the perception of having alternatives to GA to complete dental work and having personal negative experiences with general anesthesia. For all parents that initially refused, but later agreed to GA, seeing their child suffering from dental pain was the main reason they later changed their minds about GA. Although uneasy about the decision at first, all three families were satisfied with the outcome and would agree to putting their child under GA if they were in the same situation again.

LIST OF TABLES

Table 1: Interview Consent

Dear Sir/Madam: We would like to invite you to take part in a research study being done by Michelle Tsao, DMD at the University of California, San Francisco. We would like to interview you to learn more about the reasons why you may have declined dental treatment under general anesthesia for your child. The interview will last about 30 minutes and you will be gifted a $30 gift card to thank you for your time and participation. You may skip questions that you do not want to answer or stop the interview at any time. We will keep the data we collect confidential, and we will not share your personal information with anyone outside the research team. Being in this study is optional. Please tell the researcher if you do not want to participate. If you have any questions, please contact Michelle Tsao at michelle.tsao@ucsf.edu. If you have questions or concerns about your rights as a research participant, you can call the UCSF Institutional Review Board at 415-476-1814.

Table 2: Interview Questions

1. Tell me about your child's dental health?
a. What is the current status of child's dental health?
b. What are parents perceptions of baby (primary) teeth versus adult (permanent) teeth?
2. Tell me about your experiences taking your child to the dentist
a. Are they mostly positive/negative? Why?
3. Can you explain what putting your child under GA means to you?
4. What are the benefits of putting your child under GA?
5. What are your greatest concerns about putting your child under GA? a. Where did you learn about these? b. What did you do to help deal with the concerns? i.e. Pray, research, ask people, etc.
6. What are the factors that influenced your decision to put/not put your child under GA?
7. In what situation would it be acceptable to put your child under GA? Why?
a. i.e. Pain/life threatening/infection/for medical procedure/Familial support?
8. Describe you/your family's experiences with GA? (if none, can speak to medical care)
9. Ideally who would you trust the most/trust the least to give you the recommendation for GA for your child? Why?
10. Is there anything else you want to add that we did not have a chance to talk about?

Table 3: Participant Demographics Recorded

Participant Demographics
• Child Information
○ Age at time of GA referral
○ Gender
○ Special Health Care need? (I.e. Autism)
○ Outcome/whether child received treatment and in what setting
• Parent/Guardian Information
○ Relationship to child
○ Race
○ Ethnicity
○ Primary household language
○ Secondary languages spoken in household
○ Places lived in the past
○ Age
○ Profession
a. Highest level of education

Table 4: Codes Generated from Interviews

CODES	MAIN THEME (Y/N)
Alternative GA Options	Y
Child Has Dental Concern/Pain	Y
Child’s Age	Y
Child’s Health/Medical Status	N
Cultural Perspectives	Y
Family/Friend Influences	Y
Fear of Medical Risks	Y
Fear of Traumatizing Child	N
Media Influence	Y
Personal Stories and/or Experiences	N
Trust/Distrust in Healthcare Professionals	Y
Understanding/Misunderstanding of GA	Y
View of Primary Teeth (in comparison to Permanent Teeth)	Y

Table 5: Health Belief Model: Five of the Six Domains Applied to Study

HBM Domains	Themes	Illustrative Quotations
Perceived Severity	Low perceived severity of why GA was needed	“If something cannot be avoided. If it’s life threatening, then definitely I would say general anesthesia would be totally acceptable by me. But if it’s something he may outgrow, or if it’s something for esthetics or dental work that doesn’t need general anesthesia, I wouldn’t easily allow general anesthesia for him unless it was no choice. “ 2_E
Perceived Benefits	Single appointment, less traumatic for child	“I feel he will be more calm, he can't feel anything. It could be less traumatic for him, I believe to be put asleep during the operation.” 5_E1
Perceived Barriers	Fear of medical risks of GA	“what worries me is that she’s not going to wake up, that she’s not going to be able to handle -- that they give her too much anesthesia or something like that.” 10_S1
Perceived Susceptibility	Fear of death from GA outweighing importance of treating dental issues	“I've read about a couple of cases where the child has died and I would rather he lose his teeth than go through general anesthesia.” 2_E
Cues to Action	Pain affecting day-to-day and family life	“I don't want him to be on pain anymore because it was so hard seeing him at night crying so bad about his pain.” 8_E1
Self-Efficacy*	N/A	N/A

***** *Self-efficacy was not included because it relates to the confidence in oneself to do the behavior, and in this case the behavior is a decision, so it did not fit well.*

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