

# Perceived outcomes and satisfaction of Saudi parents and their children following dental rehabilitation under general anesthesia: A 2-year follow-up

Hisham Yehia El Batawi, Priyankar Panigrahi, Manal A. Awad

Department of General and Dental Practice, College of Dentistry, University of Sharjah, UAE

Corresponding author (e-mail: <helbatawi@sharjah.ac.ae>

Dr. Hisham Y. El Batawi, Department of General and Dental Practice, College of Dentistry, University of Sharjah, UAE.

## Abstract

**Purpose:** To investigate the perceived clinical outcome and parents' satisfaction after dental rehabilitation under general anesthesia over a follow-up period of 2 years. **Materials and Methods:** A prospective study of questionnaire data obtained from 352 pediatric patients before and after treatment of early childhood caries with full dental rehabilitation under general anesthesia. Questionnaires focused on oral symptoms, functional limitations, and emotional and social well-being before and after dental treatment. Cases were followed up for 2 years postoperatively. **Results:** A dramatic disappearance of symptoms was reported from parents' perspective. There was a high satisfaction rate (99.14%) also among parents of the children included in the study. **Conclusion:** Children with early childhood caries do not necessarily express it verbally as pain. The disease has a lot of other expressions affecting children's behavior and habits, including the ability to sleep, thrive, and socialize. This study contributes to the existing literature that full dental rehabilitation under general anesthesia [dental general anesthesia (DGA)] has an immediate positive impact on the physical and social quality of life of children suffering from early childhood caries as well as on their families. Postoperative preventive care, early diagnosis, and treatment of recurrent caries are key factors to maintain postoperative outcome of DGA.

**Key words:** Dental rehabilitation, general anesthesia, parental satisfaction

## INTRODUCTION

Dental research has shifted interest from causes of dental disease to how dental disease affects the quality of life of affected patients. The effects of untreated dental caries may have a long-term impact on the child's family, schooling, personality, social relationships, sleep patterns, physical growth and development.<sup>[1,2]</sup> On the other hand, the extensive work is needed to effectively

manage dental caries in children which requires prolonged multiple visits and a level of cooperative behavior that is not usually achievable in infants and preschool children, very often necessitating the use of dental general anesthesia (DGA) in order to provide satisfactory dental treatment.<sup>[3,4]</sup> Due to the potential risks associated with DGA, it has been considered to be the last resort for dental treatment. This is also related to costs and parental acceptability.<sup>[5]</sup> However, for a pediatric dentist to decide to expose a child to the calculated risk associated with general anesthesia, he/she is left under the ethical obligation that the outcome of treatment would outweigh the risk.

A study by Acs *et al.*<sup>[6]</sup> on the effect of dental rehabilitation on the body weight of children with early childhood caries (ECC) concluded that comprehensive treatment under general anesthesia results in "catch-up

Access this article online	
Quick Response Code:	Website: www.jispcd.org
	DOI: 10.4103/2231-0762.149024

growth,” such that children with a history of ECC no longer differed in percentile growth from the control group.<sup>[6]</sup> The authors followed up with another study in 2001 in which they concluded that children who received DGA achieved improvement in their quality of life as well as overall health.<sup>[7]</sup>

White *et al.*<sup>[8]</sup> investigated parental satisfaction of 45 cases of DGA and their perception of the impact of the procedure on the physical and social quality of life. Their findings indicated that DGA for preschool children has a high degree of satisfaction among parents and is perceived to have a positive social impact on their children. In 2004, Anderson *et al.* also concluded that DGA results in an immediate improvement in oral health and aspects of the quality of life for both children and their families.<sup>[9]</sup>

In 2007, Amin and Harrison investigated 26 parents' compliance to long-term (6 months) maintenance of healthy behaviors following DGA. They concluded that DGA had no effect on parental maintenance of healthy behavior. They also concluded that parents' readiness for change is a detrimental factor in the successful outcome of DGA.<sup>[10]</sup>

The conservative nature of Saudi Arabians and people of Gulf countries may have an effect on postoperative communication with caregivers, jeopardizing the quality of postoperative care.<sup>[11]</sup> This may call for more studies on parental perception regarding the postoperative outcome of DGA and how does single-visit full rehabilitation DGA might impact the child's quality of life in Saudi Arabia.

The aim of this study is, therefore, to investigate the possible impact of single-visit full dental rehabilitation DGA on aspects of children's oral health-related quality of life from parents' and children's perspective in Saudi Arabia over a follow-up period of 2 years.

## MATERIALS AND METHODS

Institutional ethical approval was obtained from the relevant committees based on the institution's Corporate Social Responsibility (CSR) standards. Informed consent was routinely obtained from parents and guardians following Joint Commission for International Accreditation (JCIA) standards. Consent forms included information describing the use of data, photos and videos for research and quality improvement purposes, and a statement regarding the compliance of the protocol with the World Medical Association

Declaration of Helsinki on ethical principles for medical research involving human subjects, October 2001.<sup>[12]</sup>

This is a prospective study of questionnaire data obtained from 352 pediatric patients before and after treatment of ECC with full dental rehabilitation under general anesthesia. Questionnaires focused on oral symptoms, functional limitations, and emotional and social well-being before and after dental treatment. Cases were followed up for 2 years postoperatively.

The present study was conducted in a Saudi private hospital of 600 bed capacity and 90 outpatient clinics. The hospital is accredited by both JCIA and Australian Council for Healthcare Standards International.

Pediatric dental rehabilitation is provided by the hospital's consultant of pediatric dentistry. Two dental assistants aided in the collection of data.

### Inclusion criteria

American Society of Anesthesiologists (ASA) I and II children with ECC whose indication for dental treatment under general anesthesia was due to lack of cooperation and/or the load of required dental treatment were included.

### Exclusion criteria

Children who underwent DGA for non-restorative procedures (e.g. tooth transplantation, removal of impacted supernumeraries, surgical orthodontics, traumatic cut wounds or facial fractures) with or without restorative work were excluded from the study.

Out of a total 473 children who had DGA that year, 431 children fulfilled the inclusion criteria and their records were included in the study.

A composite structured questionnaire was formulated based on previous studies<sup>[7,9,13,14]</sup> [Table 1]. The Arabic version of the above questionnaire was obtained from a legal translation office authorized by the American consulate in Jeddah, KSA. Parents were asked to complete this translated composite questionnaire that sought their perception of treatment outcomes to dental rehabilitation.

Pre- and postoperative interviews were carried out with both the children and their caregivers to gain accuracy of children's self-assessment added to the perspectives of parents as decision makers. Also, in cases of child patients with special needs and/or children with limited

communication skills, parents/caregivers were the main source of information.

The first author and the same two dental assistants carried out all pre- and postoperative interviews.

Preoperative interviews were conducted on 431 cases; however, 79 patients did not show up for postoperative care visits during the following 2 years. So, the study was carried out on the remaining 352 cases that attended postoperative care.

A standardized dental rehabilitation protocol [Table 2] was followed for all children undergoing dental

rehabilitation under general anesthesia in the medical facility, including the 352 cases investigated in the current study.

This protocol was thought to minimize postoperative dental needs and subsequent repeat of DGA.

Patients were recalled for an early follow-up visit 7–10 days after the procedure and subsequently every 6 months for a 2-year follow-up period. Postoperative care is described in detail by El Batawi.<sup>[15]</sup>

Preoperative interviews were conducted on the day of initial examination during the recording process of the chief complaint and dental history. After recovery, and before discharge, parents were given a copy of the questionnaire as a reminder of the items related to their child’s outcome of dental rehabilitation, in order to be prepared for postoperative interview at the next visit. Due to doubts regarding parent’s compliance with the postoperative care regimen, postoperative interviews were carried out on the first possible postoperative visit during the follow-up period of 2 years.

Demographic and clinical data were collected from the hospital’s electronic filing system and questionnaires analyzed using Microsoft Excel®. The before and after comparisons of oral health-related quality of life were analyzed using McNemar Test included in Analyse-It® standard edition software plug-in package for Microsoft Excel.  $P < 0.05$  was considered significant.

## RESULTS

A total of 431 cases underwent the preoperative interview, out of which 227 were males and 204 were females. Mean age was 3 years 8 months, ranging between 2 years 4 months and 10 years 11 months. The study was completed on a total of 352 (192 males, 160 females) cases due to absence of 79 children for postoperative follow-up protocol.

Mean baseline dmft score was 11.2 with a range of 4–20. The total number of teeth which needed treatment in all 431 children was 4830. Fifty-six percent of these needed pulpotomy (6.2 teeth per child), 37% underwent fillings which accounted to 4.2 teeth per child, and 7% had to be extracted (0.74 teeth per child). The numbers of dental services provided under general anesthesia are presented in Table 3. Along the 2-year follow-up period, 58.8% of the 352 cases who showed up postoperatively were found to have recurrent caries.

**Table 1: Pre- and postoperative parental perception questionnaire**

**Questionnaire (children with their caregivers)**

Oral symptoms
Food caught between teeth
Pain in teeth/mouth
Bad breath
Mouth sores
Bleeding gums
Functional limitations
Difficulty chewing coarse food
Difficulty drinking or eating hot/cold foods
Difficulty eating foods that the child would like to eat
Restricted diet
Troubled sleeping
Emotional and social well-being
Worried of being less attractive
Shy/embarrassed
Avoided smiling in front of strangers
Did not want to speak or read in class
Asked by other children about the condition
Missed school
Parental satisfaction
Overall experience is satisfactory
Would consider general anesthesia for treatment again
In case of available safe sedation, would you prefer multiple visits over one-visit general anesthesia?

**Table 2: Dental rehabilitation protocol**

Conditions	Management provided
Small carious lesions	Restored with fluoride releasing compomer restorative
Primary molars with more than two decayed surfaces	Restored with a preformed metal crown, even if no pulp exposure was evident
Primary teeth with large carious cavities and questionable pulp health	Pulpotomized using the formocresol technique and crowned with steel crowns
Teeth with questionable prognosis	Extractions were performed
Caries-susceptible pits and fissures	Pit and fissure sealant

*Routine topical fluoride application was performed prior to extubation and recovery*

Caries recurrence was observed in 50% of children who fully complied with postoperative care. The percentage of caries recurrence was 67.8% among children who did not comply with postoperative care schedule, i.e. showed up only because of pain. A weak statistical significance was observed between compliance with postoperative care schedule and caries recurrence (Somers' d < 0.15).

Perceived outcomes to dental rehabilitation [Table 4] demonstrated 92 from 352 (26.13%) children complained of food impaction and 69 out of 352 complained of dental and/or oral pain before treatment. None of them had those complaints after treatment.

Forty-one children out of 352 (11.64%) had bad breath, out of which only 3 had the same complaint even after treatment. Fourteen children out of 352 (3.97%) had mouth sores before treatment; only 2 of them had the same complaint after treatment. Twenty-two children out of 352 (6.25%) complained of bleeding gums before

treatment and only 1 (0.28%) had the same complaint after treatment.

Before treatment, 31.25% had difficulty chewing coarse food, 27.27% complained of discomfort or pain upon drinking hot or cold foods, and 33.8% reported difficulty in eating foods they normally enjoy, and none of them had the same complaint after treatment. Forty-seven children out of 352 (13.35%) had special food to be prepared for them separately from that for the rest of their families (restricted diet). Four of them continued to have the same arrangement after treatment. Disturbed sleeping expressed as interrupted sleep or taking long time to fall asleep was reported in 64 (18.18%) before treatment, whereas only 3 of them reported the same complaint after treatment.

Before treatment, 15 children (4.26%) reported fear of being less attractive; none of them had this complaint after treatment. Fourteen children (3.97%) were reported to be shy and/or embarrassed because of the appearance of their teeth; only one of them reported to be shy after treatment. Twenty-six children out of 352 (7.38%) reported that they avoided smiling in front of strangers before treatment. None of them continued to have the same complaint after treatment. Eighteen children out of 352 (5.11%) were reported to be reluctant when invited to read or speak in public or in class. Two of them continued to have the same difficulty. Twenty-four children out of 352 (6.81%) were embarrassed by being asked about the condition by their classmates. None of them were reported

**Table 3: Dental services provided in the study under general anesthesia**

Procedure	Total number	Mean±SD	Range
Pulpotomy	2693	6.2±1.8	0-12
Fillings	1814	4.2±2.4	4-18
Steel crowns	1346	3.1±1.9	0-8
Space maintainer (chair-side)	91	0.21±0.6	0-2
Extractions	323	0.74±1.1	0-6

SD=Standard deviation

**Table 4: Perceived outcomes after full dental rehabilitation under general anesthesia**

	Preoperative (%)	Postoperative (%)	P value
<b>Oral symptoms</b>			
Food caught between teeth	92 (26.13)	0 (0.0)	
Pain in teeth/mouth	69 (19.6)	0 (0.0)	
Bad breath	41 (11.64)	3 (0.85)	<0.001
Mouth sores	14 (3.97)	2 (0.56)	<0.001
Bleeding gums	22 (6.25)	1 (0.28)	<0.001
<b>Functional limitations</b>			
Difficulty chewing coarse food	110 (31.25)	0 (0.0)	
Difficulty drinking or eating hot/cold foods	96 (27.27)	0 (0.0)	
Difficulty eating foods that the child would like to eat	119 (33.8)	0 (0.0)	
Restricted diet	47 (13.35)	4 (1.13)	<0.001
Troubled sleeping	64 (18.18)	3 (0.85)	<0.001
<b>Emotional and social well-being</b>			
Worried of being less attractive	15 (4.26)	0 (0.0)	
Shy/embarrassed	14 (3.97)	1 (0.28)	<0.001
Avoided smiling in front of strangers	26 (7.38)	0 (0.0)	
Did not want to speak or read in class	18 (5.11)	2 (0.56)	<0.001
Asked by other children about the condition	24 (6.81)	0 (0.0)	
Missed school for dental causes	11 (3.12)	3 (0.85)	<0.001

to have the same complaint after treatment. Eleven children out of 352 (3.12%) reported frequent absence from school either for toothache or for attending dental treatment. None of them had this complaint after treatment.

### Parental satisfaction

Three hundred and forty-nine parents (99.14%) found the whole experience satisfactory [Table 5]. Three hundred and forty-three parents (97.44%) would consider general anesthesia again for treatment when needed. Nineteen parents out of 352 (5.39%) would prefer multiple visits under sedation over general anesthesia.

## DISCUSSION

The current study investigated the parents’ perception on the outcome of DGA in three dimensions.

### Oral symptoms

It seems that children suffering from ECC do not necessarily express it in the form of pain. Our study demonstrates that only 19.6% of the sample had preoperative pain. This finding is in agreement with Anderson *et al.*<sup>[9]</sup> where preoperative pain was observed in 20% of cases, but less than half of what was reported earlier by Low *et al.* (48%).<sup>[13]</sup> The difference might be attributed to the authors’ choice to record only those who were definitely affirming preoperative toothache experience. The three studies are in agreement that the reported preoperative pain experience was not proportional with the preoperative dmf rate. This suggests that even in the presence of aggressive rampant caries, children do develop their ways to adapt with pain rather than to seek dental treatment.

The current study demonstrated that single-visit total dental rehabilitation under general anesthesia results in a sudden elimination of oral symptoms of ECC, and also, there is highly significant reduction of bad breath,

mouth sores, and bleeding gums. Having bad breath in patients postoperatively could be attributed to obligatory or habitual mouth breathing.

### Functional limitations

Our study demonstrated that DGA has a significant positive impact on children’s eating and sleeping behaviors. There was complete elimination of difficulties children used to encounter when attempting to eat healthy fibrous food, cold foods, and the types of food they would prefer. It is worth noting that 4 cases out of 47 continued to have specially prepared food. Three of these children suffered from “Sanjad Sakati Syndrome,” a condition confined to Bedouin Arab tribes that is characterized by hypoparathyroidism and failure to thrive (FTT). The three children continued postoperatively on soft diet due to limited postoperative improvement in their ability to grind and chew hard food.<sup>[2,15]</sup>

### Emotional and social well-being

A dramatic change in emotional and social well-being was reported in the study. It is of interest that three children missed school postoperatively due to failure of an anterior tooth restoration, which indicates the impact of restoring upper anterior teeth on the psychology of children. It is a matter of interest that some parents observed marked improvement in their child’s behavior and sleeping habits postoperatively even though they did not report it preoperatively. Those parents did not link preoperative aggressive behavior and disturbed sleep to oral health until dental caries was eliminated.

In 2012, Alkarimi *et al.* demonstrated that comprehensive treatment of dental caries on multiple visits for a group of Saudi children significantly improved oral health-related quality of life including pain, sepsis, and dissatisfaction with teeth, smile, and poor appetite.<sup>[16]</sup> The study was conducted on Saudi children as in our study, but with a different methodology and scale. The results of both studies are in agreement regarding the oral symptoms, functional limitations, as well as emotional and social well-being. This indicates that even if a single-visit elimination of caries under general anesthesia might result in an “impressive” impact on postoperative outcome, doing the same service on several visits would have the same result in the long run.

Patients’ knowledge and awareness has boomed in the last decade with the “information revolution.” Patient satisfaction may play a major role in the near future of

**Table 5: Parents’ response to parental satisfaction survey**

	Yes (%)	No (%)
Overall experience is satisfactory	349 (99.14)	3 (0.85)
Would consider general anesthesia for treatment again if needed	343 (97.44)	9 (2.55)
In case of available safe sedation, would you prefer multiple visits over one-visit general anesthesia?	19 (5.39)	333 (94.6)



healthcare. For pediatric dentists, patient satisfaction includes the child and his/her decision makers, parents, or caregivers. Our study demonstrated 99.14% satisfaction along the 24-month follow-up period. This goes in agreement with a similar study by Acs *et al.* in 2001.<sup>[7]</sup> However, they reported a tendency for parents not to report dissatisfaction in an in-house survey.<sup>[7]</sup> This might hold true in a public hospital, while in a private investment hospital where our study was done, both the hospital and its patients are sensitive to failure in satisfying patients and patients are eager to report such failures.

Only 2.55% of parents would not repeat the procedure under general anesthesia when needed due to the complexity of the procedure and difficulty in obtaining insurance company coverage. The relatively higher percentage of parents who would prefer sedation over general anesthesia (5.39%) could be explained on the basis that the postoperative needs of their children became already minimized to the extent of being manageable in a few visits with sedation, if needed.

We observed high postoperative no show-up rate [79 (18.32%) cases]. Most of them (61 cases) were partially covered by their insurance companies. This might reflect the international nature of the workforce in Saudi Arabia and Gulf countries, with its high turnover and rapidly changing health insurance policies. In contrast, self-funding families had the motivation of getting value for their money and, consequently, they had the best postoperative compliance rate with postoperative care plans. As the postoperative follow-up in the current study was for 2 years, no change in the high satisfaction rate was observed during the 2 years of observation.

The high parental satisfaction rate was not accompanied by a matching postoperative clinical outcome. Caries recurrence was observed in 58.8% of the sample, which is higher than that reported by Graves *et al.* (37%) and Berkowitz *et al.* (39%) but well below that reported by Almeida *et al.* (79%).<sup>[17-19]</sup> The differences probably are reflections of the complexity of caries etiology as a multifactorial problem. It is of interest that the high caries recurrence rate did not affect parental satisfaction over the 2-year follow-up period. This could be explained on the basis that postoperative caries was discovered early and treated with simple intervention within the cooperation margin of the child; therefore, the severity of postoperative decay was not extensive to disturb the child. A higher caries recurrence rate

was observed among children who did not comply with the postoperative plan of care; but this did not affect parental satisfaction, which may be because parents acknowledged that their failure to attend proper postoperative care is to be blamed for any unsatisfactory postoperative outcome.

Studies which seek to investigate satisfaction through interviews and/or questionnaires could be affected by misinformation and acquiescence biased answers. Moreover, the child's immaturity and dependence on adults render him/her unqualified to be the sole source of information. A shy child may be too shy to verbalize his/her shyness and a child in pain does not have the same skill as that of an adult to express the nature of his/her suffering. Accordingly, we had to include parents and caregivers in the pre- and postoperative interviews. Added limitations to this study are confined to Saudi communities. The conservative nature of Saudi society imposes restrictions on inter-gender communication. While the mother is generally the primary caregiver, it is not uncommon for a male dentist to interview the mother through the father, which imposes a potential risk that data might be lost or distorted. Furthermore, imported labor constitutes half of Saudi workforce, so it is common to have a patient whose primary caregiver is a domestic helper recruited from South East Asia, which adds a potential language barrier for the accurate communication of data during interviews.<sup>[20]</sup>

Attempting to overcome these limitations, we conducted the interviews with both child patients and their caregivers, trying to get the advantage of a child's self-reporting and adult's skill of communication and abilities to verbalize realities. We formulated a questionnaire in accordance with Guyatt and Cook's recommendations that when considering a measure for use in clinical practice or clinical trials, clinicians and investigators should look for evidence that the outcomes it addresses are in fact important to the target population.<sup>[21]</sup> Within that context, our questionnaire items were selected to address problems that occur most frequently and cause the maximum worry to our child patients, rather than the items that measure health status. We overlooked the questionnaire items that are not applicable in Saudi Arabia. For example, Anderson *et al.* investigated how parents find it difficult to arrange dental appointments for their child without having to take time off work with subsequent loss of income.<sup>[9]</sup> Such an item is hard to investigate in Saudi Arabia, as women are not allowed to drive and the majority of families rely on

recruited private drivers to normalize family activities, and so it is very common to have a child attending a dental visit escorted solely by his/her driver while his/her parents are at work. Should a male pediatric dentist interview a mother, a dental nurse has to be around and whenever the principal caregiver is a recruited foreigner, the hospital has assigned interpreters available on 24/7 basis for Urdu, Bahasa Indonesia, Farsi, Tigrinya, in addition to the Pilipino dental assistants covering almost all the possible languages spoken by the patients.

In managing the “*I don’t know*” response, we recorded that as negative if the questioned item was related to oral symptoms or functional limitations. For emotional and social well-being items, there was a possibility that the response is a positive one and the child is too shy to talk about it. In such cases, parents were further questioned to get a closer answer to reality as possible.

## CONCLUSIONS

- Children with dental caries do not necessarily express it verbally as pain; the disease has a lot of other expressions affecting children’s quality of life, including the ability to sleep, thrive, and socialize
- Parental acceptance for general anesthesia as an option for their child’s dental treatment is growing
- Postoperative preventive care, early diagnosis and treatment of recurrent caries are key factors to maintain favorable postoperative outcome of DGA
- In the Arab Gulf region, the principal caregiver is not necessarily the mother. Care should be taken by the pediatric dentist to identify and include the principal caregiver in planning postoperative preventive care should a successful outcome of DGA be achieved and maintained
- The current study contributes to the existing literature that parents prefer single-visit full dental rehabilitation under general anesthesia more than doing the same procedure on multiple visits due to the immediate positive impact on the physical and social well-being of children and their families
- The positive impact on parental perception observed in this study was not affected by postoperative high recurrence rate of caries.

## ACKNOWLEDGMENT

The authors would like to thank Soliman Fakeeh Hospital, Jeddah KSA for making this work possible.

## REFERENCES

1. Williamson R, Oueis H, Casamassimo PS, Thikkurissy S. Association between early childhood caries and behavior as measured by the Child Behavior Checklist. *Pediatr Dent* 2008;30:505-9.
2. Elice CE, Fields HW. Failure to thrive: Review of the literature, case reports, and implications for dental treatment. *Pediatr Dent* 1990;12:185-9.
3. Sheiham A. Dental caries affects body weight, growth and quality of life in pre-school children. *Br Dent J* 2006;201:625-6.
4. Livny A, Assali R, Sgan-Cohen HD. Early childhood caries among a Bedouin community residing in the eastern outskirts of Jerusalem. *BMC Public Health* 2007;7:167.
5. Fields HW Jr, Machen JB, Murphy MG. Acceptability of various behavior management techniques relative to types of dental treatment. *Pediatr Dent* 1984;6:199-203.
6. Acs G, Shulman R, Ng MW, Chussid S. The effect of dental rehabilitation on the body weight of children with early childhood caries. *Pediatr Dent* 1999;21:109-3.
7. Acs G, Pretzer S, Foley M, Ng MW. Perceived outcomes and parental satisfaction following dental rehabilitation under general anesthesia. *Pediatr Dent* 2001;23:419-23.
8. White H, Lee JY, Vann WF Jr. Parental evaluation of quality of life measures following pediatric dental treatment using general anesthesia. *Anesth Prog* 2003;50:105-10.
9. Anderson HK, Drummond BK, Thomson WM. Changes in aspects of children’s oral-health-related quality of life following dental treatment under general anesthesia. *Int J Paediatr Dent* 2004;14:317-25.
10. Amin MS, Harrison RL. A conceptual model of parental behavior change following a child’s dental general anesthesia procedure. *Pediatr Dent* 2007;29:278-86.
11. El Batawi HY. Factors affecting clinical outcome following treatment of early childhood caries under general anesthesia: A two-year follow-up. *Eur Arch Paediatr Dent* 2014;15:183-9.
12. World Medical Association. World Medical Association Declaration of Helsinki. Ethical principles for medical research involving human subjects. *Bull World Health Organ* 2001;79:373-4.
13. Low W, Tan S, Schwartz S. The effect of severe caries on the quality of life in young children. *Pediatr Dent* 1999;21:325-6.
14. Jokovic A, Locker D, Stephens M, Kenny D, Tompson B, Guyatt G. Measuring parental perceptions of child oral health-related quality of life. *J Public Health Dent* 2003;63:67-72.
15. El Batawi HY. Sanjad-Sakati syndrome dental management: A case report. *Case Rep Dent* 2013;2013:184084.
16. Alkarimi HA, Watt RG, Pikhart H, Jawadi AH, Sheiham A, Tsakos G. Impact of treating dental caries on schoolchildren’s anthropometric, dental, satisfaction and appetite outcomes: A randomized controlled trial. *BMC Public Health* 2012;12:706.
17. Almeida AG, Roseman MM, Sheff M, Huntington N, Hughes CV. Future caries susceptibility in children with early childhood caries following treatment under general anesthesia. *Pediatr Dent* 2000;22:302-6.
18. Graves CE, Berkowitz RJ, Proskin HM, Chase I, Weinstein P, Billings R. Clinical outcomes for early childhood caries: Influence of aggressive dental surgery. *J Dent Child (Chic)* 2004;71:114-7.
19. Berkowitz RJ, Amante A, Kopycka-Kedzierawski DT, Billings RJ, Feng C. Dental caries recurrence following clinical treatment for

- severe early childhood caries. *Pediatr Dent* 2011;33:510-4.
20. Flynn P. The Saudi Arabian labor force: A comprehensive statistical portrait. *Middle East J* 2011;65:575-86.
  21. Guyatt GH, Cook DJ. Health status, quality of life, and the individual. *JAMA* 1994;272:630-1.

**How to cite this article:** El Batawi HY, Panigrahi P, Awad MA. Perceived outcomes and satisfaction of Saudi parents and their children following dental rehabilitation under general anesthesia: A 2-year follow-up. *J Int Soc Prevent Communit Dent* 2014;4:S153-60.

**Source of Support:** Nil, **Conflict of Interest:** None declared.