PARENTAL PERCEPTION ON QUALITY OF LIFE OF THEIR CHILDREN FOLLOWING DENTAL TREATMENT UNDER GENERAL ANAESTHESIA

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PARENTAL PERCEPTION QUALITY OF LIFE OF THEIR CHILDREN FOLLOWING DENTAL TREATMENT UNDER GENERAL ANAESTHESIA

by

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'His command is only when He intends a thing that He says to it, "Be,"

and it is.' (36.82)

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LIST OF ABBREVIATIONS

AAPD	American Association of Paediatric Dentistry
ADHD	Attention Deficit Hyperactivity Disorder
AMDI	Advanced Medical and Dental Institute
ASA	American Society of Anaesthesiologists
CS	Conscious Sedation
CEP	Cleft Evaluation Profile
CPQ	Child Perceptions Questionnaire
EW	Emotional Well-being
FC	Family Conflict
FL	Functional Limitations
FIS	Family Impact Scale
GA	General Anaesthesia
LA	Local Anaesthesia
MOH	Ministry of Health
OS	Oral symptoms
OHRQoL	Oral Health-Related Quality of Life
PA	Parental/family Activity
PE	Parental Emotions
P-CPQ	Parental-Caregivers Perceptions Questionnaire
SCDA	Special Care Dentistry Association
SPSS	Statistical Package of the Social Science
SSC	Stainless steel crowns
UM	Universiti Malaya
UKM	Universiti Kebangsaan Malaysia

UMT	Universiti Malaysia Terengganu
USM	Universiti Sains Malaysia
WHO	World Health Organisation

LIST OF APPENDICES

PERSEPSI IBU BAPA TERHADAP KUALITI HIDUP ANAK BERIKUTAN RAWATAN PERGIGIAN DENGAN PENGGUNAAN BIUS AM

ABSTRAK

Anestesia umum (GA) digunakan secara meluas untuk memberikan rawatan pergigian yang selamat dan berkesan untuk pesakit pediatrik dengan keadaan fizikal, mental dan perubatan yang tidak dapat bertindak balas terhadap teknik pengubahsuaian tingkah laku yang lain. Objektif kajian ini adalah untuk menentukan kepentingan dan penerimaan anestesia umum dalam kalangan ibu bapa yang anaknya telah menjalani rawatan di bawah GA di Advanced Medical and Dental Institute, Universiti Sains Malaysia dan kesan rawatan di bawah GA terhadap kualiti hidup kesihatan pergigian anak mereka. Bahagian 1 kajian ini, 113 rekod (Oktober 2015 - Februari 2019) telah dikaji untuk mengetahui jenis rawatan pergigian dan sebab rawatan diberikan di bawah GA. Pada masa yang sama, hanya 56 daripada 113 ibu bapa dari rekod tersebut menjawab soal selidik yang diadaptasi dari Soal Selidik Ibu Bapa dan Pengasuh (P-CPQ) dan Profil Penilaian Cleft (CEP) untuk mengetahui persepsi dan kepuasan ibu bapa terhadap rawatan pergigian di bawah GA. Untuk Bahagian 2, ia adalah kajian pra dan pasca rawatan di mana 58 ibu bapa yang mempunyai anak (Mac 2019 - Disember 2019) yang berdaftar untuk rawatan mereka di bawah GA diminta untuk menjawab soal selidik yang sama seperti di Bahagian 1. Hasilnya menunjukkan jenis rawatan utama yang dilakukan adalah pengekstrakan gigi desidus (93.0%) dan rawatan menggunakan korona keluli tahan karat dan semen Glass-ionomer. Alasan utama menggunakan GA adalah pemulihan mulut menyeluruh kerana karies rampan (72.5%), sebab-sebab perubatan (18.7%) dan masalah tingkah laku (8.8%). Skor min keseluruhan (SD) P-CPQ adalah 57.44 (17.75), dan untuk Profil

Penilaian Muka adalah 17.44 (9.59). Hasil menunjukkan kesemua 56 ibu bapa (100%) berpuas hati dengan rawatan pergigian di bawah GA. Untuk kajian pra dan pasca rawatan, terdapat perbezaan yang signifikan antara skor min pra-rawatan P-CPQ dan pasca rawatan untuk gejala oral, batasan fungsi, kesejahteraan emosi, dan kesejahteraan sosial dengan nilai-*P* masing-masing adalah 0.007, 0.006, 0.001 dan 0.043. Namun, tidak ada perbezaan yang signifikan dalam profil penilaian wajah dengan nilai $P = 0.385$. Rehabilitasi oral adalah alasan utama memberikan rawatan di bawah GA dan SSC digunakan untuk melindungi gigi posterior, sedangkan GIC adalah bahan pilihan. Penerimaan oleh ibu bapa terhadap rawatan di bawah GA untuk anak-anak dapat dilihat dalam kajian ini dengan kesan positif terhadap OHRQoL anak mereka. Semua responden melaporkan berpuas hati dengan rawatan pergigian yang diberikan di bawah GA. Secara amnya, terdapat peningkatan yang signifikan dalam kualiti hidup pesakit selepas rawatan. Kajian lanjutan dengan bilangan subjek yang lebih banyak dapat memberikan hasil yang lebih tepat.

PARENTAL PERCEPTION ON QUALITY OF LIFE OF THEIR CHILDREN FOLLOWING DENTAL TREATMENT UNDER GENERAL ANAESTHESIA

ABSTRACT

General anaesthesia (GA) is extensively used to deliver safe and effective dental treatment for paediatric patients with physical, mental and medically compromising conditions who fail to respond to other behaviour modification techniques. This study's objective is to determine the importance and acceptance of general anaesthesia among parents whose child has undergone treatment under GA at Advanced Medical and Dental Institute, Universiti Sains Malaysia and the impact of treatment under GA has on their child's Oral Health Quality of Life (OHQoL). Part 1 of this study, 113 records (October 2015 - February 2019) were retrived to find out the type of treatment performed and reasons for the treatment being provided under GA. Simultaneously, only 56 out of 113 parents from the record responded to answer parents' perception and satisfaction on dental treatment under GA using a questionnaire adapted from the Parents and Caregivers Perception Questionnaire (P-CPQ) and Cleft Evaluation Profile (CEP). For part 2, it was pre and post-treatment study where 58 parents with children (March 2019 - December 2019) registered for their treatment under GA were requested to answer the same questionnaire as in Part 1. The results showed the main type of treatment performed was extractions of deciduous teeth (93.0%) and restoration using stainless steel crowns and Glass ionomer cement. The reasons for administering GA were total oral rehabilitation (72.5%) due to rampant caries, medical (18.7%) and behavioural problems (8.8%). The total mean(SD) score for P- CPQ was 57.44 (17.75), and for Facial Evaluation Profile was 17.44 (9.59). All the 56 parents (100%) were satisfied with the dental

treatment under GA. For pre and post-treatment study, there is a significant difference between the mean score of P-CPQ pre-treatment and post-treatment for oral symptoms, functional limitation, emotional well-being, and social well-being with a *P*-value of 0.007, 0.006, 0.001 and 0.043, respectively. However, there is no significant difference in the facial evaluation profile with *P*=0.385. Oral rehabilitation was the reason of providing treatment under GA and SSC were used to protect posterior dentition, whereas GIC was the material of choice. Acceptance by parents on treatment under GA for children could be seen in this study with a positive effect on OHRQoL of their child. All the respondents reported satisfied with the dental treatment provided under GA. Generally, there was a significant improvement in the quality of life of the patient's post-treatment. Further study with a larger number of subjects may give a more precise results.

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

To deliver pain-free treatments under time-controlled circumstances in children, the management of medical or behavioural problems is a major concern for dentists (Karim et al., 2008). Many techniques have been developed to help the child to provide the necessary treatment, such as tell-show-do technique, desensitisation, amplification, modelling, hypnosis, sedation and treatment under general anaesthetic (GA) (Strom et al., 2015).

Single-visit oral rehabilitation remains to be the primary purpose of treatment under general anaesthesia. Research has also shown that GA is a supportive tool to help patients whose treatment have postponed or cancelled altogether (Blumer et al., 2017; Jankauskienė et al., 2013; Karim et al., 2008). However, dental treatment under GA is an expensive treatment method and still represents a general health risk. With careful pre-operative examinations, experienced healthcare providers and vital post-operative care, the procedure can be fruitful (Cravero & Blike, 2004).

Despite declining rates over the last decade, rampant caries is still widespread, among young children that affects their quality of life (Rajavaara et al., 2017; Thomson, 2016). Due to the prevalence of rampant caries at an early age, a renewed need for treatment is considered the primary factor for dental rehabilitation under general anaesthetic (Rudie et al., 2018; Norderyd et al., 2017). Other valid reasons for administering GA for dental treatment are modalities such as extractions, the insertion of stainless steel crowns, pulp therapy and corrective surgeries such as cleft lip and palate (Raja et al., 2016; Lehtonen et al., 2015; Cravero & Blike, 2004).

In the Malaysian scenario, research reporting the outcomes of dental treatment under GA among paediatric patients and the effects of GA on the quality of life is still scarce. Hence, the current study is proposed to provide insight into these scenarios.

1.2 Problem Statement

Providing a pain free treatment experience becomes a challenge for the dental practitioner in case of children whether due to behavioural or medical problems or just their age (Strom et al., 2015). Pain management is an indicator of considering use of general anaesthesia as a treatment modality as we not just want to treat the child but also want to preserve their day to day life as close to normal as we can in order to protect their developing psychology (Blumer et al., 2017). Use of general anaesthesia for treatment of paediatric patients can help in improving their quality of life leaps and bounds (Karim et al., 2008). Still, concurrently it is ubiquitous for parents to resist this treatment option if not reject it altogether due to lack of information, fear and anxiety related to the procedure and sometimes due to cost or wait period (Yang et al., 2019). The availability of characteristics of paediatric dental treatment performed under GA is scarce in the Malaysian scenario (Karim et al. 2008). Additionally, parents' perceptions of dental treatment under GA and how it affects their child's quality of life have never been assessed before. Treatment under GA for paediatric patients is being delivered through out Malaysia at hospital setups with up to date facilities where patients are carefully assessed and treated according to their rehabilitative needs, mental and physical condition (Karim et al., 2008). Such studies are scarce due to these facilities' limited accessibility, restricted to only large hospitals with paediatric dental specialities and general anaesthesia services (Karim et al., 2008). Treatment under GA is an expensive modality and most of the parents either say “no” because of their

financial problems or because of the fact that there is a lot of fear related to mortality and morbidity due to GA (Roberts et al., 2020).

Hence, the study results will provide additional information and knowledge on the area, costs and budgeting that must be taken into account to ensure the services' sustainability, particularly in developing countries. It will also help in documenting the type of treatment being provided and why are these children being treated under GA for their oral rehabilitation. Since there have been no documented studies regarding the impact of treatment under GA on the QoL life, this study will also give an insight on how the treatment improves life of the child and parent's willingness to consider this modality an option.

1.3 Conceptual Framework

The provision of dental treatment under GA being provided is generally divided into three groups as listed below (Karim et al., 2008);

1. Outpatient-short case dental chair anaesthesia :

   Its dental office anaesthesia, mainly for simple extraction of teeth and other simple dental treatment, especially in children. They are walk-in patient and does not require a hospital stay.

2. Outpatient-day stay intubation anaesthesia :

   It is for minor oral surgeries, and most patients are discharged after about two hours of surgery after being kept under observation in the recovery unit of the hospital. Normally orthodontic extractions, minor surgeries or rehabilitative treatment for healthy patients.

3. Hospital stay intubation anaesthesia :

It is for complicated extractions, oral surgical procedures and maxillofacial surgical procedures, where the patient is admitted at least a day before surgery and sometimes post-surgery until recovered completely, especially if the patient has some on-going medical or behavioural condition.

A vast group of patients are admitted for treatment under GA; they can mainly be either behavioural problems or handicapping conditions like congenital heart diseases (Dziedzic, 2017) and bleeding disorders (Jankauskienė et al., 2013). The practitioner would also consider providing dental treatment under GA in managing very young patients with rampant caries (Blumer et al., 2017). Other reasons which indicate treatment under GA are patients with intellectual difficulties such as autism, cerebral palsy, being mentally challenged or having behavioural disabilities such as Attention Deficit Hyperactivity Disorder (ADHD) (Hosey et al., 2006). Studies have shown that for such patient's treatment under GA is a reasonable option compared to sedation or local anaesthesia since there are better moisture control and more time on practitioners' hands for better-planned restorations (Karim et al., 2008).

Hence, under GA, treatment is effective, efficient, and of superior quality, which positively impacts the paediatric patient's quality of life.

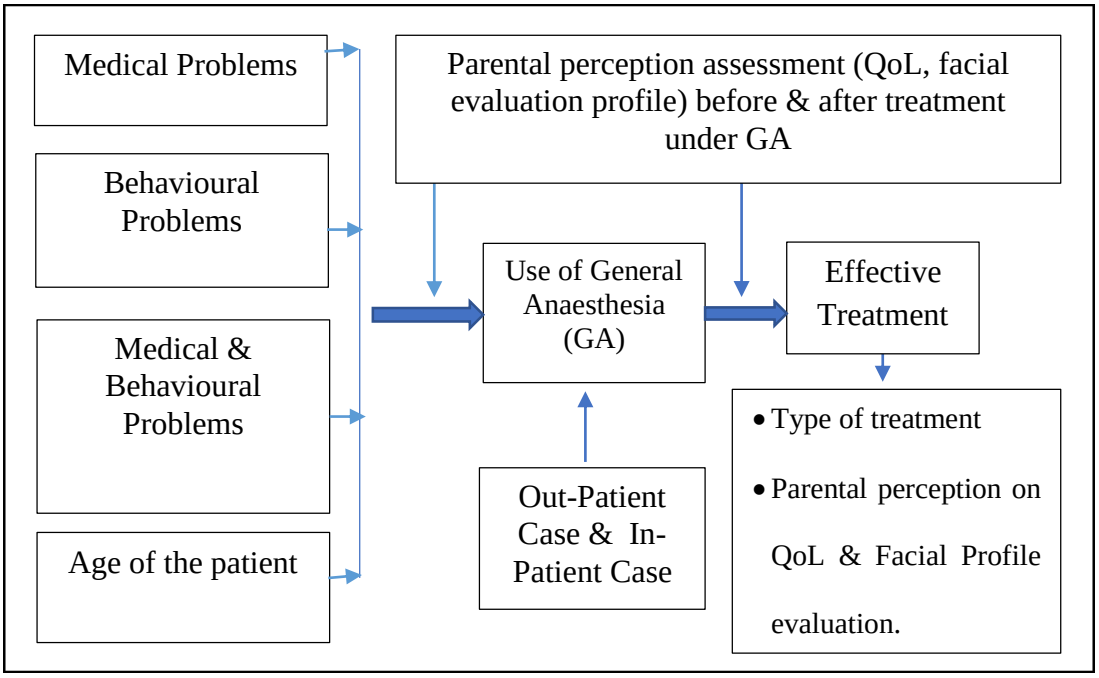

Figure 1.1 The conceptual framework of this study
(adapted from Rajavaara et al., 2017; Jankauskienė et al., 2013)

1.4 Objectives of the Study

1.4.1 General Objective

To study the acceptance and perceptions of the impact of children's oral health on quality of life following dental treatment performed under GA at Advanced Medical and Dental Institute (AMDI), Universiti Sains Malaysia, Pulau Pinang.

1.4.2 Specific Objectives

Part 1:

1. To determine the types of dental treatment performed under GA and reason for treatment at AMDI, USM, Pulau Pinang.
2. To assess parental perceptions on the impact of children's oral health on quality of life after the treatment performed under GA using P-CPQ

3. To assess parental satisfaction towards dental treatment performed under GA

Part 2:

To compare the parental perception regarding their child's oral health-related quality of life and facial profile evaluation before and after treatment under GA.

1.5 Research Question(s)

1. What is the type of dental treatment being performed under GA at AMDI, USM, Pulau Pinang?
2. What is the parent's perceptions on oral health related quality of life of their child after the treatment performed under GA using P-CPQ?
3. Is the parent satisfied with the dental treatment performed under GA?
4. Is there any difference in parental perception regarding their child oral health-related quality of life and facial profile evaluation before and after treatment under GA?

1.6 Hypothesis of the Study

1.6.1 Working Hypothesis

i) There is significant difference in parental perception regarding their child oral health-related quality of life before and after treatment under GA.

ii) There is significant difference in parental perception regarding their children's facial profile evaluation after dental treatment provided under GA.

1.6.2 Null Hypothesis

i) There is no significant difference in parental perception regarding their child oral health-related quality of life before and after treatment under GA.

ii) There is no significant difference in parental perception regarding their children's facial profile evaluation after dental treatment provided under GA.

1.7 Research Approaches

This study was a retrospective record review of patients who had undergone dental treatment under GA where information on medical and dental history, the reasons and type of treatment being provided was retrieved. Concurrently, a cross-sectional study was carried out by contacting the parents from the patient's record to answer questionnaire on parental perception of oral health related quality of life of their child following dental treatment performed under GA. For the pre and post study, the same questionnaires were used as the main initiatives of collecting data to assess parent perception and impact their children's quality of life following treatment under general anaesthesia.

CHAPTER 2

LITERATURE REVIEW

It has been deemed extremely crucial to ensure that children and adolescents receive safe and active pain control during dental treatment (Andreeva, 2018). A child's dental anxiety is strongly linked to familiarity with the experience's pain and trauma, not independent dental pathology (Adewale, 2012). This fear can be directly associated with paternal, especially maternal anxiety (Jankauskiene & Narbutaite, 2010). Pain management has been broadly divided into two groups, non-pharmacological management which includes behavioural techniques such as tell-show-do, positive reinforcement and distraction techniques (Ramzani, 2016). The other group of pain management is pharmacological management techniques which includes use of local anaesthesia (LA), conscious sedation and general anaesthesia (Al-Malik & Al-Sarheed, 2006).

Table 2.1 List of pain management techniques (Ramzani, 2016; Al-Malik & Al-Sarheed, 2006).

Techniques	Practise
Non-pharmacological Techniques	
Tell-show-do	Using the language child understands regarding procedure.
Positive Re-enforcement	Rewarding good behaviour with approval and praise
Modelling	Encourage the child to watch other children of same age receive dental treatment at clinics.
Behaviour Shaping	Reinforcing positive behaviour whereas ignoring/ discouraging negative responses towards treatment.
Desensitisation	Used for children with pre-existing needle-phobic. Hierarchy of steps created in order to cope-up with fear invoking stimulus.

Table 2.1 (Continued)

Techniques	Practise
Pharmacological Techniques	
Local Anaesthesia	Chair-side technique for small procedures. Example: Lidocaine, Mepivacaine
Consicous Sedation	Inhalation Sedation: Nitrous oxide/ O_2 mixture used to render sedative effect commonly known as 'laughing gas'. Intravenous Sedation: Not commonly used for children under 12 years of age. Only indicated for speciality centres (hospitals) Oral Sedation: Midazolam and choral hydrate used. Only indicated for speciality centres (hospitals)
General Anaesthesia	Combination of sedative, anaesthetic and muscle relaxants used to provide pain free treatment. Only indicated for hospital settings under specialist supervision.

2.1 General Anaesthesia

General anaesthesia can be defined as "A drug-induced loss of consciousness during which patients cannot be woken up, even by painful stimulation. The ability to independently maintain ventilatory function is often impaired. Patients will require assistance while maintaining a patent airway. Positive pressure ventilation may be required because of depressed spontaneous ventilation and drug-induced depression of neuromuscular function. Cardiovascular function may also be impaired" (Anaesthesiologists, 2019). This treatment modality has a risk for mortality and morbidity and often performed in a hospital or surgical centre where anaesthesiologists are available (Strom et al., 2015).

2.2 Types of Anaesthesia

Anaesthesia is divided into three types (Anaesthesiologists, 2019), namely, local anaesthesia (LA), conscious sedation, and general anaesthesia (GA), which have been briefly explained in Table 2.1 below

Table 2.2 The different level of sedation and its effect on the human body (adapted from Yang et al., 2019, Adewale, 2012)

Level of Sedation	Features	Effect on Body
Minimal	The child is awake and calm, responding naturally to verbal commands	• No effect on the ventilator and cardiovascular function
Moderate Level I	The child is sleepy but responds purposefully to verbal commands	• No interventions required to maintain a patent airway • Spontaneous ventilation is adequate • Cardiovascular function is usually maintained
Moderate Level II	The child is sleepy and requires light tactile stimulation to produce a purposeful response	• No intervention to maintain a patent airway • Spontaneous ventilation is required • Cardiovascular function is usually maintained
Deep	The child is asleep and cannot be easily aroused	• The child may require assistance in maintaining a patent airway • Responds purposefully to repeated or painful stimulation • Spontaneous ventilation may be inadequate • Cardiovascular function is maintained

2.2.1 Local Anaesthesia (LA)

Local anaesthesia is a chairside technique during which an injection of medicine numbs the body's particular area; it is needed to be administered mostly only once (Anaesthesiologists, 2019). Local anaesthesia is used for procedures such as performing a biopsy, suturing or non-surgical teeth extractions (Peedikayil and Vijayan, 2013). The patient is alert and awake and may feel some pressure but does not feel pain in the area being treated. The most commonly used local anaesthetic in paediatric dentistry is Lidocaine (2% mg in 100 ml) (Peedikayil and Vijayan, 2013). Other examples of local anaesthetic agents used are described in Table 2.2 with their duration of action and action period.

Table 2.3 The list of local anaesthetic agents with their maximum dose and time of action (adapted from Coté & Wilson, 2019)

Anaesthetic Agent	**Dosage (Maximum) mg/kg**	**Onset time (Minutes)**
Lidocaine 2% (Plain or with Epinephrine)	300	5
Mepivacaine 3% (Plain or with Epinephrine)	300	20
Articaine 4% (with Epinephrine)	500	60
Prilocaine 4% (Plain)	400	20
Bupivacaine 0.5% (with Epinephrine)	90	40

2.2.2 Conscious Sedation (CS)

'Conscious sedation is a drug-produced unconsciousness during which patients respond decisively to vocal instructions, either alone or supplemented by light tactile stimulations' (Anaesthesiologists, 2019). Anaesthetic agents used for conscious sedation are described in Table 2.3 with their regular doses and time needed for action.

Table 2.4 The anaesthetic agents used during conscious sedation (adapted from Pacheco & Ferayorni, 2013)

Agents Name	Standard Dose	Onset time (Minutes)
Opiates		
Morphine	0.1-0.2 mg/kg	1-5
Fentanyl	1-2 mcg/kg	1-3
Benzodiazepines		
Midazolam	0.02-0.1 mg/kg	5
Barbiturates		
Pentobarbital	2-5 mg/kg	15-60
Hypnotics		
Propofol	1 mg/kg	6-7
Dissociative		
Ketamine	1-2 mg/kg	5
Inhaled		
Nitrous Oxide	30-50% N_2O, mixed with O_2	3-5

2.2.3 General Anaesthesia (GA)

General Anaesthesia is a drug-induced loss of consciousness by a physician anaesthesiologist under operation theatre settings, during which most of the body's functions are depressed or need help to work effectively (Yang et al., 2019). Throughout the procedure, the physician anaesthesiologist monitors the patient's vital

signs such as heart rate, blood pressure to make sure they are normal and not free of pain.

Table 2.5 Commonly used anaesthetic agents during treatment under general anaesthesia (adapted from Andreeva, 2018; Yoon & Kim, 2016)

Agent Type with drugs	**Standard Dose**	**Onset Time (Minutes)**
Sedative/Hypnotic		
Benzodiazepines		
Midazolam	0.1 mg/kg	1-5
Propofol	2.5 mg/kg	1.5-2
Analgesic Agents		
Narcotics		
Fentanyl	1-2 mcg/kg	1-3
Morphine.	0.1-0.2 mg/kg	2-5
Nonsteroidal		
Anti-Inflammatory		
Agents (NSAIDs)		
Ibuprofen	10 mg/kg	3-5
Analgesics/Antipyretics		
Acetaminophen	10-15 mg/kg	10-12
Muscle Relaxants		
Depolarising		
Succinylcholine	1.0 mg-2 mg/kg	0.5-1.5
Non-Depolarising		
Rocuronium	1.5 mg/kg	Less than 1.5
Inhaled		
Nitrous Oxide	30-50% N_2O, mixed with O_2	Less than 3
Sevoflurane,	Conc. Between 2-4%	Less than 3

2.3 American Society of Anaesthesiologists (ASA) Classification for treatment under General Anaesthesia

This classification enables practitioners to chart and monitor the patient's condition and plan treatment accordingly.

Table 2.6 Physical status of patients according to ASA guidelines (adapted from Anaesthesiologists, 2019)

ASA Classification	Definition	Examples of Associated Medical Conditions
ASA I	Normal Healthy Patient	Healthy, Non-smoking patient
ASA II	Patient with mild systemic disease	Mild Diseases without substantive functional limitations
		Controlled Diabetes Mellitus, mild lung disease, pregnancy, obesity (BMI>40)
ASA III	Patient with severe systemic disease	Substantial functional limitations, one or more moderate to severe diseases
		Uncontrolled Diabetes Mellitus, Chronic Obstructive Pulmonary Disease, Morbid obesity (BMI>40), Active Hepatitis, Cerebral Venous Accident (CVA), Myocardial Infarction
ASA IV	Patient with severe systemic diseases that is a constant threat to life	Ongoing cardiac ischemia or severe valve dysfunction, sepsis or undergoing dialysis
ASA V	A moribund patient, not suspected to survive without the operation	Ruptured aneurysm, massive trauma, multiple organ/system malfunctions
ASA VI	A declared brain-dead patient whose organs are being removed for donor purposes.	

2.4 Stages of Anaesthesia

General anaesthetics can be broadly divided into inhaled and intravenous anaesthetics, both generally administered by anaesthesiologist not just to induce but maintain the state of the patient (Hutchinson, 2011). Inhaled anaesthetic includes gasses and halogenated agents, whereas intravenous anaesthetics include injectable agents that induce anaesthesia (Shanthi, 2014). Table 2.6 describes the stages of anaesthesia starting from the induction stage until the surgical anaesthesia phase, where the patient is in reversible loss of consciousness. In contrast, stage four is an irreversible loss of consciousness and is considered a medical emergency (Silva et al., 2015).

Table 2.7 Stages of anaesthesia (adapted from Anaesthesiologists, 2019)

Anaesthesia Stage	Phase	Description
Stage I	Induction Phase	Medications give to gain loss of consciousness. Patient experiences amnesia
Stage II	Excitation Phase	Transit stage between induction and adequate surgical anaesthesia, marked irregularity is observed in heart rate, blood pressure and respiration
Stage III	Surgical Anaesthesia Phase	Heart rate, blood pressure and respiration are back to baseline, and the patient can undergo surgery
Stage IV	Overdose	Too much medication resulting in brain stem depression and potential cardiovascular collapse

2.5 Dental Treatment under General Anaesthesia

General anaesthesia has been used in dentistry for more than four decades (Hutchinson, 2011). While planning treatment for paediatric dental patients, pain management is a part of behavioural management (Ramdav et al., 2017). If pain is out of control, it will directly affect the quality of dental treatment being delivered (Silva et al., 2015). Treatment under GA creates a better opportunity for dentists to provide quality treatment to patients (Hutchinson, 2011). It also allows dentists to treat patients with medical or behavioural conditions such as uncooperative children, patients with developmental and muscle coordination disorders, any systemic illness that can be exacerbated due to anxiety or generally highly anxious or phobic adults (Mokhtar et al., 2016).

2.5.1 Indications and Contraindications of General Anaesthesia in Dentistry

Neither the indications nor contraindications of using GA for dentistry are absolute (Ramazani, 2016). They both need a dentist's assessment. It is suggested that deciding to treat a patient under GA is complicated, and the associated risk should be taken into account before even planning the treatment (Anaesthesiologists, 2019). The fact that most operative care can be carried out using either local anaesthesia (LA) or conscious sedation makes it more challenging to decide (Ramdaw et al., 2017). Before the commencement of the procedure, parents and caretakers of the child must be informed. The use of GA as a treatment modality should be discussed with them. Following are a few points of consideration (Anaesthesiologists, 2019):

1. The child’s capacity for co-operation.
2. The possibility of anxiety and the child’s reaction regarding similar procedures in the past.

3. The extent of surgical traumas is expected.
4. The extent of complexity required to perform the planned operative procedure
5. The child's medical condition and related history.

Although it is much understood that in most dental treatment, the child will not suffer from pain if the treatment is not provided but certainly will cause a lot of distress (Karim et al., 2008). Following guiding principles should be kept in mind:

1. Not harm.
2. Act in the child’s best interest.
3. Respects the child’s right to refuse treatment.

The indications of G.A. as a treatment modality of choice include the following conditions as mentioned in previous reports (Ramdaw et al., 2017; Lehtonen et al., 2015)

1. Patients who are suffering from specific physical, mental medical conditions.
2. Patient on whom LA is ineffective due to acute infections, anatomic variations, or allergies still requires oral rehabilitation.
3. The child who is an extremely uncooperative, fearful, anxious, physically resistant child or adolescent but has substantial dental needs and no or less expectation in improving behaviour should suggest dental treatment under GA.
4. Patients with extensive oral and facial trauma
5. Patients who require immediate comprehensive dental treatment.

6. Patients for whom the use of GA can reduce medical risk and emerging psychological conditions.

Treatment under GA is contraindicated for patients with allergic reactions history or chance of arrhythmias or those with minimal dental needs that can be treated under LA (Strom et al., 2015).

The American Association of Paediatric Dentistry (AAPD) and Special Care Dentistry Association (SCDA) highlights that dentists should consider other management techniques rather than treating a patient under GA to obtain the best results long term (Roberts et al., 2020).

All the treatment being provided under GA is not always risk-free (Strom et al., 2015). Hence it should still be limited to those patients and clinical situations where local anaesthesia (LA) is impossible (Roberts et al., 2020). GA is an efficient treatment modality where little or no cooperation is required from the patient; thus, comprehensive oral rehabilitation can be performed in a single sitting (Karim et al., 2008). Nevertheless, it should be considered the last option as it may pose a risk to the patient's overall health.

2.5.2 Advantages and Disadvantages of Dental General Anaesthesia

The primary purpose of treatment under dental general anaesthesia is to allow total oral rehabilitation in a single visit (Karim et al., 2008). Literature has concluded that GA is an assisting tool to provide treatment to patients who refused treatment under normal clinical circumstances (Silva et al., 2015; Strom et al., 2015; Karim et al., 2008). It has some drawbacks, but with careful pre-operative assessments, experienced healthcare providers and vital post-operative care, the whole procedure

can be successful (Cravero & Blike, 2004). Some of the advantages of providing dental treatment under GA to patients include:

2.5.2(a) Advantages towards the operator

1. The patient is not required to cooperate.
2. Rapid onset and action of GA are observed.
3. Titration of drugs to produce the desired effect is possible.

2.5.2(b) Advantages towards patient

1. The patient does not respond to pain.
2. Amnesia is present after the procedure.

The disadvantages of treatment under GA, according to literature (Silva et al., 2015; Strom et al., 2015 are stated below:

2.5.2(c) Disadvantages towards the operator

1. The person administering GA needs to be explicitly trained.
2. A team of professionals (rather than an individual dentist) should be providing treatment.
3. Special equipment is required for anaesthesia.
4. For postoperative monitoring (in a private setting, the dental operatory itself may serve as a recovery room), there must be a recovery area.
5. Intraoperative and postoperative complications are more common during GA than during sedative procedures. It is recommended that patients receiving GA should refrain from drinking clear liquids for at

least two hours and ingesting solids and non-human milk for at least six hours preoperatively.

6. Patients with extensive pre-operative evaluation and testing are needed for patients who are given treatment under GA.

2.5.2(d) Disadvantages towards patient

1. The patient is unconscious during the treatment.
2. The muscular reflexes of the patient are depressed.
3. Most of the vital functions of the body, cardiovascular and neuromuscular, are depressed during the treatment.
4. The patient needs assistance in breathing.

Literature suggests that, although the advantages of selecting treatment under GA as a treatment option are substantial, it is essential to consider the disadvantages and significance of each patient's physical and mental status (Karim et al., 2008). Thorough pre-operative assessment considerations by the dentist and discussion with the patient and patient guardian are essential before deciding to proceed with the treatment under general anaesthesia (Karim et al., 2008). Having stated that studies have shown that use of GA to treat children has not just improved the quality of the treatment being provided but also deemed to be a painless solution to fulfil comprehensive oral treatment needs of the patient without his co-operation (Silva et al., 2015). Treatment under GA protects the child's developing psyche regarding dental phobia since we don't scare the child by using local anaesthetic or conscious sedation where the child can hear and see everything being done (Strom et al. 2015). Use of GA to treat paediatric patients has been proved to improve their QoL leaps and bounds (Karim et al., 2008). Everyday activities like sleeping, eating, drinking and

interacting with friends and family improves since the child is not in pain anymore (Locker et al., 2003). Hence the practicality of GA outweighs its risks and with proper patient assessment, treatment planning and parents counselling this treatment modality can help treat children with comprehensive oral needs (Roberts et al., 2020; Ramdaw et al., 2017; Karim et al., 2008).

2.6 Oral Health-Related Quality of Life

A recently developed but rapidly growing idea is Oral health-related quality of life (OHRQoL), which has been discussed over the past two decades (Bennadi & Reddy, 2013). OHRQoL, 'a multidimensional concept which along with other aspects echoes the comfort of individuals while eating, sleeping and engaging in social interaction; their self-esteem, and their satisfaction concerning oral health and the associated functional factors, psychological factors, social factors and experience of pain by the child' (Sischo & Broder, 2011; Born et al., 2016). A group of tools known as the Child Oral Health Quality of Life Questionnaire (COHQoL) was developed in Canada in English to investigate how children's oral health affects their lives and families and how parents recognise their child's oral health. The questionnaires that make up the child oral health-related quality of life are the Child Perceptions Questionnaire (CPQ), the Parental-Caregivers Perceptions Questionnaire (P-CPQ), and the Family Impact Scale (FIS) (Park et al., 2018; Locker et al., 2003; Jokovic et al., 2002). All of the questions in the respective questionairres help the practitioners to understand the impact of oral health on the daily life of the child (White et al., 2004).Each and every domain refers to an aspect of life which collectively depict the impact treatment provided under GA. (Park et al., 2018).

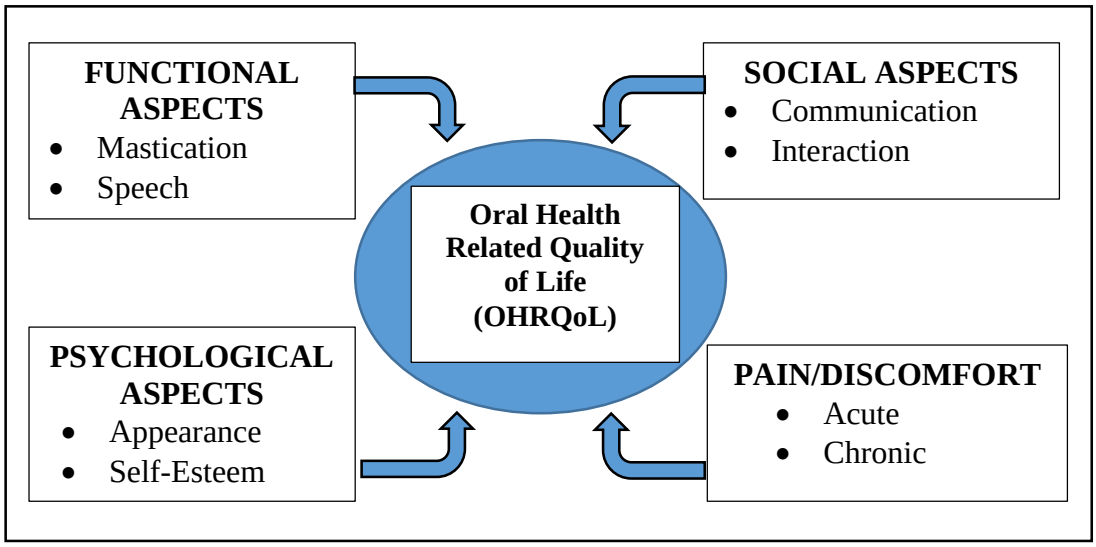

Figure 2.1 Diagrammatic representation of the concept of Oral Health-Related Quality of life (adapted from Jokovic et al., 2004)

2.6.1 The Child Perception Questionnaire

Various OHRQoL questionnaires for children have recently been curated and utilised in clinical trials to assess the effect of GA treatment on the child's overall health-related quality of life, the majority of which reflects the positive outcome (von Baeyer et al., 2011; Wondimu & Dahllof, 2005). Since the beginning children's health was measured using reports from parents or caregivers, who are usually the principal decision-makers on their health (Jankauskiene & Narbutaite, 2010). The treatment choices are mainly governed by their perception regarding treatment and its impact on the child. These reports have been mentioned as ‘proxy reports’ (White et al., 2003). For infants, those with cognitive impairment and those who are too ill to answer the questionnaire, parent’s/caregiver proxy will be needed. Even if the children can self-report, the parent or caregiver's proxy report should be considered indispensable and can be a crucial tool for making clinical decisions (Jokovic et al., 2004). The report suggests that in the Western world, the demand for treatment being provided under GA has increased, and now parents appreciate this treatment option as it dramatically

improves the quality of life of the child and proves to have a positive impact on the family (Chia-Ling Tsai et al., 2006). It also positively affects the parent, and patient satisfaction is a vital outcome for health service and determinant in utilisation and follows up compliance (White et al., 2003). Although self-reporting is the standard gold method for measuring pain in every patient, it is often impossible to measure self-reporting for children (Daher et al., 2015). In 2005, Danish and Swedish studies proposed that young children report pain with a particular uncertainty, which can be due to their low cognitive ability, directly related to their age (Ogling et al., 2017; Wogelius et al., 2009).

2.6.2 Parents Caregivers Perception Questionnaire (P-CPQ)

Documenting OHRQoL for adults is not a new research field. Still, studies assessing this concept among children following dental treatment under GA is rare due to the lack of validated measures (Jankauskiene & Narbutaite, 2010). Despite the positive feedback of GA as a treatment option for young children with advancing rampant caries, there are hardly any studies on quality of life (Ogling et al., 2017). All previous studies are based on the theory that the absence of disease is equal to health. This theory is lacking since it does not consider health's psychological and social aspects (White et al., 2003). In 2004, Jokovic et al. addressed quality of life concerns related to improvement in pain, eating, sleeping, and overall health. Following treatment under GA when the surveyed majority of parents reported that their children had an improved quality of life. According to Acs et al. (2001), pain relief was the most significant predictor of parents' perception that their child's quality of life was improved following treatment. To some parents, dental treatment under GA is distressing as it is performed in the operating theatre; however, this situation is

sometimes necessary, especially in managing young children, uncooperative and medically compromised children (Yawary et al., 2016). The treatment under GA carries its risks; it is a psychologically and emotionally challenging decision for the parents.

Specific questionnaires have been developed to measure the parent's satisfaction (Jankauskiene & Narbutaite, 2010). If parents fill out the questionnaire, the results depend on the parents' ability to suggest an unbiased assessment of their child's physical, mental state and social well-being (Park et al., 2018), parents being considered a valid proxy. Even when the child can decide for their parent's opinion, sometimes approval still exists (Jokovic et al., 2004). As the child's primary advocate in all health care areas, the parent/caregiver's perspective must be taken into account and, more importantly, undoubtedly understood. Barbosa and Gavião (2008) and Ali et al. (2016) have conducted a study on assessing the oral quality of life of children and parents and their agreement on all aspects that indicate that parents or caregivers generally decide about the health of their children. Therefore, it is crucial to assess parents' perception of how oral health and dental care affect their children's quality of life.

A study conducted at the National Medical Centre in Washington, D.C, found that seventy-two per cent of parents who had their children treated under GA viewed it as a helpful tool for treatment (Acs et al., 2001). They reported an improvement in pain relief, eating and sleeping by 86%, 69% and 41%, respectively. Parents with children suffering compromised medical conditions perceived that their child's quality of life had much more improved than those without compromised medical conditions. Although most parents were satisfied and their expectations were met, 36% preferred a safer sedative option, even if it meant repeating the treatment. Additionally, poor