

Knowledge and Attitude of Nepalese Dental Practitioners towards Pediatric Dental Treatment under General Anesthesia

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ABSTRACT

Introduction: Young children often cannot comply reasonably during dental treatment. For effective and efficient care, dental treatment under general anesthesia (DGA) may sometimes be necessary for the dental treatment of pediatric patients.

Objective: The present study aimed to assess knowledge and attitude of Nepalese dental practitioners towards pediatric dental treatment under general anesthesia.

Methodology: This cross-sectional study was conducted with an online-based questionnaire in Google forms among 400 dentists registered in the Nepal Medical Council. The questionnaires were completed in three sections: demographic data, knowledge, and attitude towards DGA. Knowledge was assessed using three multi-response questions and quantified, and attitude was evaluated using five dichotomous items. After completing, analysis was done by SPSS software v.26.0. Descriptive statistics like frequency and percentage were used to evaluate the primary results.

Results: Among the participants, 369 (92.3%) were aware of DGA. Among the participating dentists, 340 (85%) had no experience of performing DGA, and the most common reason for not doing DGA was lack of knowledge. Knowledge regarding DGA among the participants was poor (knowledge score 36.7%) among the participants. According to the participants, possibility of performing multiple dental treatment in one session was the major benefit of DGA. Among the participants performing DGA, the most common conditions for preferring DGA were when the child required multiple dental treatment but was unable to attend multiple times, and children with special healthcare needs. Attitude towards DGA was positive among participants (mean attitude 4.27/5). Majority of the participants agreed that DGA helps the dentists to provide effective and efficient treatment.

Conclusions: The present study revealed that the practice of DGA is very low among the Nepalese dentists. Although the participants had positive attitude towards DGA, knowledge regarding DGA was poor. The present study reveals the gap between perception and understanding of DGA among the Nepalese dentists. This ultimately highlights the need of revision of curriculum in dental schools so as to increase knowledge and practice of the students, and provision of regular standardized training on DGA to the Nepalese dentists to enhance their skill and practice of DGA.

Keywords: Attitude; children; dental treatment; general anesthesia; knowledge; Nepalese dental practitioners.

INTRODUCTION

Oral health possesses significant impact on the development of a child, his/her general health, and quality of life. Unfortunately, oral health of children is often neglected by healthcare providers, parents,

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and even by some of the dental practitioners.¹ Young children often cannot comply reasonably during dental treatment. As an outcome, dental treatment gets delayed resulting in discomfort and the loss of teeth.² Behavior guidance is an important concern in pediatric dentistry. Behavior guidance techniques like verbal and non-verbal communication, tell-show-do, sedation, and general anesthesia (GA) etc. can be used while treating young patients.³

According to the central bureau of statistics report 2021, child population occupies 34% of total population in Nepal.⁴ The American Association of Pediatric Dentistry (AAPD) permits the use of GA in situations when patient require extensive dental treatment, refuse to cooperate, is fearful and anxious, and communication with the patient is difficult.⁵ Studies regarding preference and practice, and knowledge and attitude towards different behavior guidance techniques among Nepalese dental practitioners treating children is scarce. Therefore, the present study aimed to assess knowledge and attitude of Nepalese dental practitioners towards pediatric dental treatment under general anesthesia.

METHODOLOGY

A descriptive cross-sectional study was performed among 400 Nepalese dentists. The sample size was calculated by using Yemen's Formula. $n = N / (1 + N(e)^2) = 366.76 = 400$ [where, n=required sample size, N=number of registered dentists in Nepal⁶, e=0.05 error at 95% confidence interval]. Convenience sampling method was opted to enroll the participants. Nepal Medical Council registered dental interns, dental surgeons, postgraduate residents, and dental faculties working in dental colleges, hospitals and private clinics in Nepal were included in the study, connecting through social media platforms. Whereas, dental practitioners who were not working as clinician during the study period, not willing to participate in the study, and who were not able to completely fill the google form were excluded. A questionnaire survey was conducted between 1st September 2023 – 30th August 2024. Informed consent was obtained from the participating practitioners. Before commencement

of the study, approval was obtained from the Institutional Review Committee of the the People's Dental College and Hospital, Kathmandu, Nepal (Ref. No. 1, CHNO 18, 2080/2081, IRC PDCH 2023 20).

The data collection tool was an online-based questionnaire in Google form. The questionnaire was shared to the Nepalese dental practitioners via different social media platforms like Facebook, Instagram, Viber, WhatsApp and Facebook messenger. The questionnaire was pilot-tested and validated among 30 dental practitioners to examine their interpretation, and to determine their initial attitude towards dental treatment under general anesthesia (DGA). The research questionnaires were completed in three sections: demographic data, knowledge, and attitude towards DGA. The knowledge section included participants' understanding and experience of DGA.^{7,8} The answers to the statements portraying attitude were "agree" and "disagree".⁸ Statements addressed a range of topics, such as cost, facility constraints, anesthesia-related anxiety, and time efficiency.

Knowledge was assessed using 3 items and attitude using 5 items. Each correct response was assigned a score of 1, while incorrect or unanswered responses were scored as 0. Similarly, for attitude assessment, responses were dichotomized as agree (1) and disagree (0).⁸ The total scores were converted into percentages. Both knowledge and attitude levels were categorized using a uniform method as: good (scores $\geq 80\%$), moderate (60–79%), and poor ($< 60\%$), in accordance with standard knowledge, attitudes and practices (KAP) study practices.⁹ Data was recorded in Excel, and analyzed using SPSS software v.26.0. Descriptive statistics like frequency and percentage were used to evaluate the primary results.

RESULTS

Among the participants 104 (26%) were dental surgeons, 93 (23.2%) were dental interns, 62 (15.5%) were postgraduate residents, 31 (7.7%) were pediatric dentists, and 26.7% belonged to other dental specialties. (Table 1)

Table 1. Demographic data of the participants (n = 400).

	Variables	Frequency (n)	Percentage (%)
Gender	Male	124	31
	Female	276	69
Academic qualification of participants	Bachelor of Dental Surgery Interns	93	23.2
	Dental surgeon	104	26
	Postgraduate resident	62	15.5
	Oral Physician and Maxillofacial Radiologist	5	1.3
	Pediatric dentist	31	7.8
	Endodontist	24	6
	Periodontist	12	3
	Orthodontist	23	5.8
	Prosthodontist	22	5.5
	Oral and Maxillofacial surgeon	9	2.3
	Public health dentist	7	1.6
	Oral pathologist	5	1.2
	Others	3	0.8
Age group (years)	≤35 years old	296	74
	≥36 years old	104	26
Location of current practice	Dental College	171	42.8
	Dental Hospital	97	24.2
	Private clinic	86	21.5
	More than one practice	46	11.5

Among the participants, 369 (92.3%) were aware of the dental procedure under general anesthesia. Regarding the question about the source of information on DGA, majority 349 (87.2%) of the participants mentioned that they got the knowledge from dental degree courses. Among the participants, 326 (81.5%) mentioned that they think pediatric dentists should be the dental practitioners performing DGA to treat dental problems of

children. 340 (80%) of the participants had no experience of performing DGA, and the most common reason for not doing DGA was lack of knowledge. The most common reason for referring the child for DGA was when the child had special healthcare needs. In addition, 388 (97%) of the participants felt that they needed additional training apart from their undergraduate syllabus to perform DGA. (Table 2)

Table 2. Awareness and experience about dental treatment of children under GA.

	Frequency (n)	Percentage (%)
Are you aware about dental treatment of children under GA		
Yes	369	92.3
No	31	7.7
How did you get information about the dental treatment of children under GA (n = 400)		
Dental degree course	349	87.2
Literature	101	25.2
Internet sources	67	16.7
Newspaper	13	3.2
Who do you think should perform dental treatment of children under GA? (n = 400)		
Pediatric dentist	326	81.5
Any dental graduate	36	9
Oral surgeon	15	3.8
Other specialty	23	5.7
Have you ever performed dental treatment of children under GA (n = 400)		
Yes	60	15
No	340	85
Reasons for not performing dental treatment of children under GA (n = 340)		
Lack of knowledge	163	47.9
I have not encountered children requiring dental treatment under GA to date	130	38.2
Lack of confidence	106	31.2
Lack of infrastructure	105	30.9
Lack of manpower	65	19.1
Others	18	5.3
Have you ever referred children for dental treatment under GA? (n = 400)		
Yes	162	40.5
No	238	59.5
What were the reasons for referring? (n = 162)		
Child has special healthcare needs	86	53.1
Child is uncooperative under local anesthesia	79	48.8
Child has a multiple dental treatment needs but cannot attend multiple visits	73	45.1
Child is uncooperative due to age	36	22.2
Presence of systemic diseases	26	16.1
Others	1	0.6
Do you think that you need any additional training apart from your undergraduate syllabus to perform dental treatment in children under GA? (n = 400)		
Yes	388	97
No	12	3

Practice of DGA seemed to be occasional routine. Among the dental practitioners who had practiced DGA, 70.9% performed DGA once a year. The common conditions for DGA was when the child required but was unable to attend multiple dental visits and when the child presented with special healthcare needs. The most common problem the respondents faced while performing DGA

was lack of dental chair in operation theater (47.7%). Majority of the participants responded that the parents (46%) didn't know about DGA, and only 5.1% of the parents easily agreed for the dental treatment under GA for their children. The most common reasons (73%) for the parents not opting DGA was the fear of complications of GA. (Table 3)

Table 3. Awareness and experience about DGA among the participants treating children under GA.

Practitioners' awareness and experience of DGA	Frequency (n)	Percentage (%)
How often do you perform dental treatment of children under GA? (n = 60)		
More than once in a week	1	1.7
Once in a week	5	8.3
Once in a month	16	26.7
Once in a year	32	53.3
Less than once in a year	6	10
What were the problems that you faced while performing dental treatment of children under GA? (n = 60)		
Unavailability of dental chair on OT setup	37	61.7
Unavailability of portable high speed airtor hand-piece	32	53.3
Insufficient number of trained manpower	28	46.7
Lack of knowledge about post anesthesia recovery and management of complications	9	15
Others	2	3.3
In which conditions do you prefer dental treatment under GA for children? (n = 60)		
Child has a multiple dental treatment needs but cannot attend multiple visits	42	70
Child has special healthcare needs	38	63.3
Child is uncooperative under local anesthesia	30	50
Presence of systemic diseases	21	35
Child is uncooperative due to age	9	15
Others	2	3.3
Did the parents know about the possibility of dental treatment of children under GA? (n = 60)		
Yes	16	26.7
Quite often	22	36.7
No	22	36.7
Did the parents easily agree to perform dental treatment of their children under GA? (n = 60)		
Yes	3	5
Quite often	28	46.7
No	29	48.3
What was/were the reasons for the parents not opting to perform dental treatment of their children under GA? (n = 60)		
Complications of GA	33	55
High cost	25	41.7
Creation of more fear and anxiety towards OT and hospital	18	30
Prolonged duration of performing treatment under GA	10	16.7
Impact on memory and intelligence of children	4	6.7
Negative behavioral changes in children following GA	0	0
Others	2	3.3

When quantified, overall knowledge score was 36.7%, which suggests that knowledge regarding DGA among the participants was poor. According to the respondents, possibility of performing multiple dental treatment in one session was the major benefit of DGA. Whereas, complications of GA and high treatment cost were the major disadvantages of DGA. In addition, 262 (65.5%) of the respondents believed that the common adverse effects of anesthesia were nausea, vomiting, fever, and allergy. (Table 4)

Overall attitude toward DGA was positive among the participants. The mean attitude score was 4.27

out of 5, corresponding to mean attitude percentage of 85.3%. Although agreement with positively worded statements ranged from 81.25% to 89.5%, lower agreement was observed for negatively worded statements (15.5%–17.0%). After reverse coding, all items indicated a consistently positive attitude. Majority of the participants agreed that DGA helps the dentists to provide effective and efficient treatment. They also stated the fact that all the facilities required for pediatric DGA are not available in all the tertiary hospitals of Nepal, and DGA is not an accepted practice among Nepalese parents. (Table 5)

Table 4. Practitioners' knowledge regarding DGA.

Practitioners' knowledge of DGA	Frequency (n)	Percentage (%)
Benefits of dental procedure in children under GA (n=400)		
Possibility of performing multiple treatments in one session	379	94.8
Reduction of fear and anxiety	273	68.3
Provision of high-quality dental treatment	171	42.8
Creating a positive attitude towards dental treatment	156	39
Better oral hygiene maintenance	11	2.8
Disadvantages of dental procedure in children under GA (n=400)		
Complications of GA	352	88
High cost	268	67
Prolonged duration of performing treatment under GA	147	36.8
Creation of more fear and anxiety towards OT and hospital	146	36.5
Negative behavioral changes in children following GA	67	16.8
Impact on memory and intelligence of children	48	12
Which of the following statements do you think is true regarding the risks of dental procedures in children under GA (n=400)		
The common adverse effects of anesthesia are nausea, vomiting, fever, and allergy	262	65.5
GA can't cause irreversible damage to the brain	45	11.3
The risk of anesthesia could be increased if the child has a common illness such as obesity, allergic asthma, or premature birth.	180	4.5
I don't know	68	17

Table 5. Attitude towards DGA (n=400).

Questions	Agree n (%)	Disagree n (%)
1. The use of GA helps dentists	394 (98.5)	6 (1.5)
2. The use of GA facilitates better dental treatment for children	360 (90)	40 (10)
3. Dental treatment under GA is safe for children	326 (81.5)	74 (18.5)
4. All facilities required for pediatric dental treatment under GA are available in all the tertiary hospitals of Nepal	64 (16)	336 (84)
5. Dental treatment in children under GA is an accepted practice among parents of children and they have enough awareness about this treatment method	70 (17.5)	330 (82.5)

DISCUSSION

In order to ensure that the right patients receive the right treatment, DGA must be completely justified. Practitioners should understand the risks and benefits of DGA.⁸ However, the average scores and correct answers for knowledge of DGA in the present study suggested that practitioners appeared to be unsure about DGA, and this impacts the usage of DGA among the Nepalese dental practitioner. Dental procedures can be completed painless and in a single session in DGA.

One of the challenges of DGA in context to countries like Nepal where dental insurance is not available easily for all the population, is the financial burden related to the cost of dental care and hospital stay. According to the current survey, the respondents mentioned that only 3 (5%) of the parents easily agreed to DGA for their children. The main reason for not choosing DGA was the fear of complications of GA, which was then followed by high expense, and possibility of creation of more fear and anxiety in children following DGA. Postoperative nausea and vomiting, hypothermia, airway management issues are among the common complications associated with GA. These complications can be minimized by thorough preoperative evaluation, skilled medical professionals, and excellent postoperative care.¹⁰ This highlights the need of standard guidelines, and regular training among the practitioner performing DGA.

In the present study, majority of the participants (74.3%) responded that they had never performed DGA of pediatric patients, and majority (81.3%) believed that pediatric dentists are the one who should be performing DGA. Majority of the participants belonged to non-specialist category (dental surgeons and interns), and this might be the reason for lesser exposure to DGA. Additionally, a practitioner's acceptance is influenced by their expertise and GA experience.

When enquiring about the need for referral of children for DGA, majority of the respondents choose the conditions “child has a multiple dental

treatment needs but cannot attend multiple visits”, which was then followed by the conditions “child is uncooperative under local anesthesia”, and “child has special healthcare needs”. This finding was coherent with the study by Rajbanshi et al. done among the dentists, anesthesiologists, dental technicians, and nurses of China.¹¹ One of the major reasons of referring for DGA among the participants by Rajbanshi et al.¹¹ was “child is uncooperative due to age” and “presence of systemic diseases”. However, these conditions fell under lesser priority among the participants on the current study. This comparison reveals that the practice of DGA in Nepal is most likely considered “the last resort” of providing the effective dental treatment to the children.

Awareness of DGA among the parents (26.7%) was comparable with the results of Dong et al.¹² in 2018 (23.8%), which was done among the Chinese parents. Acceptance of DGA was higher in the study by Dong et al.¹² (15%) as compared to the present study (5%). These findings highlight the requirement of targeted educational interventions and improved clinician–caregiver communication to address the gap in knowledge and attitude towards DGA among parents.

Practitioners' recommendations for DGA for children in need are influenced by their attitude and understanding of the practice. 93.6% of the participants mentioned that they obtained information about DGA through their dentistry degree program, and majority (97.8%) mentioned that they needed additional training apart from taught in dental colleges. These responses highlight the need for amendments in the existing curriculum of the dental schools in Nepal.

Dental treatment under GA is recommended by the AAPD in the situations like prolonged treatment duration, extreme fear and anxiety, non-cooperating children, those children who suffer the ineffectiveness of local anesthesia, and failure to establish effective communication with the children.^{13,14,15} Among the participants, the reasons for preferring DGA included special health care

needs (29.6%), need of multiple dental treatment but being unable to attend multiple visits (23.3%), followed by children uncooperative under local anesthesia, children uncooperative due to age, and presence of systemic diseases.

Dental treatment under GA is a successful treatment strategy for early childhood dental caries and a useful way to lessen dental anxiety.^{16,17} Majority of the participants agreed to that the use of GA helps dentists. However, they also believed that all facilities required for pediatric DGA are not available in all the tertiary hospitals of Nepal, and DGA is not an accepted practice among parents. Unfortunately, there is no any government agency in charge for monitoring and providing training for DGA in children. Majority of the parents also seem to be unaware about the possibility of DGA for their children. This highlights the role of Nepalese Association of Pediatric Dentistry and the Nepal government to initiate professional training in DGA, and at the same time take initiative to increase awareness regarding DGA in children.

This study is one of the earliest attempts to study the Nepalese dental practitioners' awareness and attitude towards DGA. A potentially biased sample of respondent owing to convenience sampling, and the limited depth of the questions are the limitations of this study. Nevertheless, the current study generates the baseline data to conduct further extensive studies among larger population.

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CONCLUSIONS

The present study revealed that the practice of DGA is very low among the Nepalese dentists. Although the participants had positive attitude towards DGA, knowledge regarding DGA was poor among the participants. The present study reveals the gap between perception and understanding of DGA among the Nepalese dentists. This ultimately highlights the need of revision of curriculum in dental schools so as to increase knowledge and practice of the students regarding DGA, as majority believed they required additional training apart from their course. Owing to low practice of DGA, the present study highlights the requirement of regular standardized training on DGA to the Nepalese dentists to enhance their skill and practice of DGA.

Conflict of Interest: The author declared no competing interests.

ABBREVIATIONS

AAPD: American Academy of Pediatric Dentistry

DGA: Dental treatment under general anesthesia

GA: General anesthesia

KAP: knowledge, attitudes and practices



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