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Original research

Assessment of barriers & attitude of pediatric dentist towards the use of inhalation sedation in clinical practice: a mixed method study

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Abstract

Background and aim: Behaviour management is the corner stone of pediatric dentistry. Inhalation Sedation (IS) technique is safe & effective adjuvant in reducing anxiety, and producing analgesia. To assess the attitude of pediatric dentist towards the usage of Inhalation sedation and also to investigate the barriers and obstacles faced by them during usage of IS in their routine clinical practice.

Materials and methods: Mixed method study design conducted among 200 pediatric dentist in a metro city. A 18 point questionnaire with 12 closed question & 6 open ended questions was administered to200 pediatric dentist. Quantitative data was presented as percentage, frequency and qualitative data was thematically analysed.

Results: Use of IS in pediatric dentistry was beneficial as an effective Behavior Management Technique (BMT). Regarding the safety in the usage of IS in dental setup, 90.9 % respondents agreed that IS is safe enough to be used in clinical setup. Parental acceptance of using IS for their child is a variable strata and has individual perceptions attached to it. Qualitative data was thematically analysed and after an in depth interview with different respondents various themes were generated.

Conclusion: Significant gap in the knowledge and practice of inhalation sedation among the study population was found. Through qualitative analysis, major barriers in utilisation of IS was identified.

Keywords: anesthesia, behavior management, inhalation sedation, nitrous oxide, pediatric dentists

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Introduction

In the quest of managing and delivering quality dental care to pediatric patients a wide spectrum of behavior management strategies has been adopted by clinicians so far. It involves techniques and strategies to help children feel comfortable and cooperative during their dental treatment, reducing anxiety and fear, subsequently increasing the likelihood of delivering successful quality treatment

to the child. Behaviour management, thus by and large is the cornerstone of pediatric dentistry. Various pharmacological and non-pharmacological techniques have been recommended to enable the clinician to perform quality oral health care and foster a positive dental attitude in the child[1,2,3].

Nitrous oxide sedation has a long history of safe use in dentistry and offers the clinician predictable clinical outcomes[4,5,6,7].Use of Inhalation sedation (IS) in clinical practice encompasses an integral aspect amongst the various strategies of behavior management approaches.8 It has been accepted as popular and effective pharmacological behavior management technique (BMT) among various countries across the globe[9,10]. Inhalation sedation is safe & effective adjuvant in reducing anxiety, and producing analgesia[8,9,11].

Despite being one of the effective BMT in pediatric patients, inhalation sedation is not commonly used by pediatric dentists in India[12,13]. The current study aims to explore the attitude of pediatric dentists towards the usage of IS in their routine clinical practice, also to identify the barriers and obstacles encountered by clinicians which hinder the usage of IS that might possibly help us reach the submerged iceberg of the problems faced by clinicians. Successful resolutions of the problems may help in delivering quality oral health care along with instilling a fear free positive dental arena among children. Therefore, the aim of this study was to assess the attitude of pediatric dentist towards the usage of Inhalation sedation and also to investigate the barriers and obstacles faced by them during usage of IS in their routine clinical practice.

Materials and Methods

Study population and study setting

The study was conducted through online portal for a period of 2 months from 1st December to 30th January comprising of 200 pediatric dentists practicing in a metro city. Study commenced following ethical approval by the institutional ethics committee. Ethical committee clearance reference no. YMTDC/IEC/2022/164-A.

A 18 point questionnaire with 12 closed question & 6 open ended questions was administered to 200 pediatric dentists in metro city. Domains were demographic details, type of practice, the questions about use, benefits and the challenges they faced while practicing inhalation sedation as behavior modification technique in pediatric patients. Quantitative data was presented as percentage, frequency and qualitative data was thematically analyzed. Respondents who consented to participate in further interviewing were recruited for in depth interview until the saturation of responses was achieved.

Results

Of 200 Pediatric dentists, 50 responded to the questionnaire (Response rate 25%). Results from the demographic details stated that 63.6 % of the respondents were engaged in exclusive pediatric practice, 34.5 % were involved in pediatric as well as general practice whereas 1.9 % of the total respondents were working as general practitioners (Fig 1.1). Of the total respondents, 50.9 % were working in their own clinical setup, 38.2 % were working as consultants and 10.9 % were working in a hospital based setup (Fig 1.2). 49.1 % of the total respondents were working as both academicians and private practitioners, 47.3% were solely involved in private practice whereas 3.6 % of the participants were solely working as academicians (Fig 1.3)

Respondent dentists attitude towards the usage of inhalation sedation in their clinical practice.(Table-1) Results from the current study unfolded that 40 % of the total practitioners were using inhalation sedation in their clinical practice whereas for 60 % of the participants IS was not a part of their clinical practice. Around 83.6% of the respondents had used IS at least once at some point in their clinical practice whereas 16.4% has never used IS. Use of IS in pediatric dentistry was beneficial as an effective BMT was agreed by 90% of the participants (strongly agreed by 43.6%,

47.3 % agreed),9.1 % of them had neutral opinion in this regard and none disagreed about the benefits of IS in clinical practice.

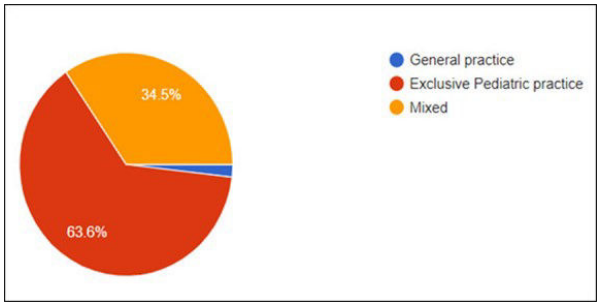

Figure 1.1:Distribution of participants based upon type of clinical practice

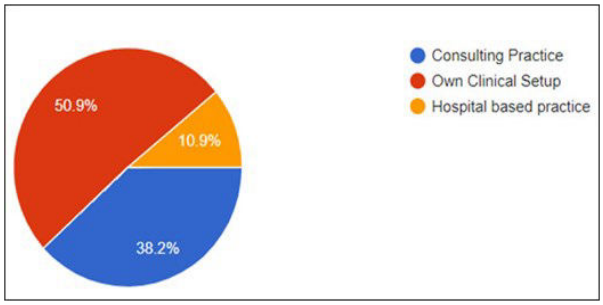

Figure 1.2: Distribution of participants based upon practice setting

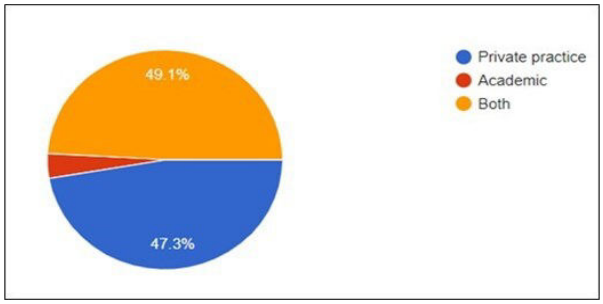

Figure 1.3:Distribution of participants based upon clinical practice and academics.

The need of a hospital based setup or anesthesiologist for using IS in their practice was denied by 69.1% respondents, 23.6 % were of the opinion that anesthesiologist or hospital based set up might be better for using IS whereas 7.3 % did not comment. Regarding the safety in the usage of IS in dental setup, 90.9 % respondents agreed that IS is safe enough to be used in clinical setup, on the contrary 1.8 % disagreed to this statement whereas 7.3 % didn't comment in this regard.

Out of the total study participants, 20% believed that parents readily accepted IS as an effective BMT for their children,12.7 % of the respondents thought contrary to the former statement whereas 61.8 % were of the opinion that the parental acceptance is a variable strata and has individual perceptions attached to it. Using IS was found to be cost effective by 56.4 % respondents, 20 % disagreed to it whereas 23.6 % had no fair judgment.

Table 1: Participants attitude towards the use of inhalation sedation
SA (strongly agreed) 43.6 % , A (Agreed) 47.3 % , NA – not applicable

PARAMETER	Yes (%)	No (%)	Don't know (%)	Varies (%)
Currently, are you using inhalation sedation in your practice ?	40	60	NA	NA
Have you ever used Inhalation sedation	83.6	16.4	NA	NA
Do you think Inhalation sedation is beneficial in pediatric dental practice	90 SA: 43.6% A: 47.3 %	10	NA	NA
Do you think there is need for hospital setup or of anesthesiologist for using Inhalation Sedation?	23.6	69.1	7.3	NA
Do you think use of Inhalation sedation is safe in dental setup?	90.9	1.8	7.3	NA
Do you think that parents readily accept inhalation sedation as a behavior modification technique ?	20	12.7	5.5	61.8
Do you think Inhalation Sedation technique is cost effective?	56.4	20	23.6	NA

SA (strongly agreed) 43.6 % , A (Agreed) 47.3 % , NA – not applicable

Qualitative analysis: Qualitative data was thematically analyzed. After an in depth interview with different respondents the following themes were analyzed and generated.

1. Cost effectiveness: whilst considering to use IS as a BMT in clinical practice, cost effectiveness is an important parameter to be taken into consideration as it might possibly be one of the barriers that might force the clinicians to take a backstep even before they can think of using inhalation sedation in their daily practice. Dentist 11 quoted that "Initial installation charges are high". On similar grounds, equipment cost and its maintenance also needs to be catered to which adds on to the financial budget and maybe owing to this many of the clinicians might overrule usage of IS. Also, using inhalation sedation adds on to the patient charges too which may or may not be affordable to the population in general.
2. Feasibility: In order to use a particular technique in our clinical practice its ease of availability is of paramount importance. Inhalation sedation setups are not available in all the clinics so it becomes difficult for consulting practitioners to outsource and readily use it. The IS unit is also not portable and handy enough to be carried by the consultants at various locations. Dentist 13

quoted "No equipment at consulting set up" . Dentist 22 quoted " Mine is a consulting practice only.

3. Lack of clear guidelines and regulations: Practitioners feel there is insufficient information regarding the regulations and guidelines to be issued by higher authorities regarding the setup and usage of IS. Dentist 4 quoted " No Clear guidelines regarding setup and usage from the authorities/ Dental Association."Lack of clear protocols and regulations might turn out to be another barrier in the usage of IS.
4. Lack of knowledge, training and understanding of inhalation sedation procedure: Insufficient training and knowledge regarding the usage of inhalation sedation technique at graduation level leading to low confidence in using IS is a major factor that withholds the clinicians from using it as a BMT. Dentist 47 quoted "Lack of knowledge & training of graduates leads to poor confidence leads to poor application in practice". Pedodontist having a high expectation in improvement of behavior of extremely disruptive child while treating under conscious sedation or using IS as last resort when other BMT have failed further reduce clinicians confidence in IS. Dentist 36 quoted "High expectation in improvement of behavior". Dentist 28 quoted "Lack of knowledge amongst patients and other fellow general dentist."Dentist 19 quoted "Lack of training for assistants"
5. Parental acceptance: one among the various considerations and participants believed that it is mandatory for pediatric dentists to take consent and take into account parent's view and considerations while carrying out any clinical procedure. Pedodontists believed that parents may be skeptical about IS and are not willing to go ahead with the procedure. Dentist 38 quoted "Faith of parents over the care givers". "Patient / Parent reluctance regarding safety" was quoted by dentist 10. Another factor that came into consideration was difficulty in using IS technique in extremely uncooperative patient:

   Uncooperative children tend to resist the treatment. They may create interruptions during treatment like not accepting the nasal hood, displacing the nasal hood from its position, not responding to commands, may provide misleading responses. Hence clinicians tend to think IS is of limited use.
6. Convenience of use: Accessibility and the clinicians convenience to use IS technique is extremely important. Availability of nasal hoods in different sizes ensuring adequate fit and a good seal is must while treating under conscious sedation, lack of availability of the nasal hoods in various sizes restricts the clinicians from further usage of IS. Dentists also need to learn to manage and work on patients with nasal hoods. In the initial phases dentist may find it inconvenient to work with nasal hood in place. Nasal hood also limits the access to maxillary anterior region especially if surgical interventions like apicectomy and frenectomy need to be carried out. Dentist 13 quoted "Good fitting Pediatric mask are not available". Dentist 22 quoted " Difficult for treating anterior teeth".
7. Space constrain: Setting up IS unit requires good enough space to accommodate the entire unit. All the clinical setups are not spacious enough to get the IS unit incorporated which makes it impossible for the clinicians to use IS. Consultants practice at different clinics at various locations and all the clinical setups might not have that infrastructure to incorporate the large unit which withholds them from carrying out treatment under sedation. Dentist 40 said "In small space - unable to fit the unit."
8. Time consumption: Time Management is of utmost importance in daily clinical practice. Carrying out a particular procedure under IS adds on to the financial expenses, time intervals, clinical records and consents that needs to be taken . On an average the entire procedure becomes more time consuming. Pre operative evaluations and consent, setting up for the unit, achieving the ideal oxygen-nitrous oxide concentration level, checking for symptoms and reassuring from the patient and then carrying out the treatment requires substantial amount of time investment . Also; documentation, post operative instructions and recovery is an integral aspect while treating under sedation which needs to be checked aptly by the clinician in person which in otherwise normal scenarios costs barely any time and can be handled by supporting staffs.

Institutions having busy OPDs may find it difficult to treat under conscious sedation. If the manpower is less, it becomes more toiling for the working staff to take up cases under sedation. Hence, proper training and adequate manpower is required for smooth functioning.

Discussion

Nitrous oxide sedation is an effective BMT. Possible reasons for its effectiveness are that nitrous oxide sedation calms agitated pediatric patients, reduces anxiety, produces amnesia and minimizes disruptive behaviour[4].This enables the dentist to reduce chairside time and instill a positive attitude towards dentistry [5].Concerning nitrous oxide sedation safety, the majority of dentists agreed on its safety, which is consistent with previously published report[4,6]. Despite numerous benefits of treating patients under inhalation sedation, it is still being underutilized. This study explores the reason for the underutilization of inhalation sedation through a mixed method approach. In depth interviews of various clinicians which formed the basis of the current qualitative analysis helped us to reach the root cause of understanding the clinicians perspective, barriers encountered by them before/during the usage of IS.

Coming to terms to the IS unit and setting up aspect, it is a major challenge faced by clinicians who wish to take up procedures under sedation . Setting up of the sedation unit requires huge lot of monetary investment as the unit itself is very costly, also the maintenance of the unit, cost of running gas cylinders need to be routinely looked after. Monetary aspect is not just restricted to setting up of the unit, clinic space as well, as only spacious clinics can incorporate the unit. This is one of the strong barriers that makes the clinician take a back step before opting for IS.

Lack of knowledge at graduation level is another drawback as the graduating professionals are not well aware of the procedural aspects, the do's and don'ts, owing to insufficient hands on procedures under sedation. The curriculum should encompass sufficient training in this regard which would widen the dynamics of knowledge pertaining to usage of IS as well as boost up the confidence and help clinicians to take up skilful procedures like sedation. Specialty practices often involves consultation based practice. Consultation based practice refers to a specialized professional who with his/her knowledge and expertise in a particular branch caters to the specific health care need of the population by visiting different clinics at various locations. Consultants often wish to go ahead with treating under sedation but lack of instant availability of the unit, aptly fitting nasal hoods, functional cylinders are a few among the many obstacles to be listed. Portability of the IS unit is one aspect which in near future might be worked upon to increase the convenience of using IS and might turn out to be a boon for consultants, as this factor was reported as a major drawback by majority of consultant practitioners.

Low parental acceptance was stated by Pedodontists as another hindrance in usage of IS. There are very limited studies on parental acceptance of IS in India. Possible reasons might be lack of awareness about the procedure, increased cost of treatment. Prerecorded videos of procedures previously carried out under sedation , parental counseling by trained professionals are a few steps that might strengthen the current scenario. Pediatric dentistry is all about effective and efficient team approach and management. Adequate training about sedation procedures to our supporting staff might reduce the burden on the clinician and might serve for time management as well. Pre operative evaluations , consents, intra operative assistance, post operative instructions and recovery are some areas where adequate knowledge and training to all the supporting staff members might serve as a helping hand for the clinician.

Conclusion

The study statistics inferred that 90 % of the participants believed that using IS was beneficial in pediatric dental practice but the statistics reflecting the percentage of clinicians actually using IS in their practice account to merely 40 %. There are few barriers in the usage of IS which makes the clinicians skeptical to go ahead with the procedure and is reflected upon by the study statistics as well. The major barriers identified were cost effectiveness, lack of knowledge and training, not feasible in consulting practice and limited application in very young children, special children and highly uncooperative children.

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