

Unveiling Nitrous Oxide Sedation Among Telangana Dentists: A Cross-Sectional Study

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ABSTRACT

BACKGROUND: Nitrous oxide inhalation sedation is widely recognised as a safe and effective technique for reducing anxiety and managing pain in dental patients. However, its application, especially in paediatric dentistry, is often debated and varies across different practices. Understanding the knowledge, attitudes, and awareness of dental professionals regarding this sedation method is essential for ensuring its effective and safe use.

METHODS: A cross-sectional survey was conducted among 200 dental professionals in Telangana. The survey has 22 questions among which 15 questions designed to evaluate participants' knowledge of nitrous oxide sedation and their attitudes toward its application.

RESULTS: The results were interpreted in percentages. Nitrous oxide inhalation sedation was known to 92% with 85.6% having first learnt about it in an academic setting. Anxiety reduction was cited by 75% as a primary indication for its use. However only 33% felt confident in their knowledge of the proper administration technique and 56.4% considered it as safe practice.

CONCLUSION: The study underscores the importance of enhancing education and training on nitrous oxide inhalation sedation among dental professionals in Telangana. By addressing identified gaps in knowledge and awareness, the safe and effective use of this sedation method can be promoted, ultimately improving patient care.

Keywords: Nitrous Oxide Sedation, Nitrous oxide inhalation, Telangana Dentists.

INTRODUCTION

Dental Fear and anxiety are major obstacles that often lead patients to avoid dental treatment which leads to deteriorated oral health. Effective behavior management is crucial for the safe completion of dental procedures in children, and conscious sedation serves as a critical tool for this purpose. Conscious sedation is a widely recognized technique in dentistry that addresses these challenges by administering sedative agents, with or without analgesics, to induce a controlled depression of the central nervous system.¹ The American Academy of Pediatric Dentistry (AAPD) recognizes nitrous oxide/oxygen inhalation as a safe and effective technique of sedation

for reducing anxiety and producing analgesia.²

This technique enables patients to undergo dental procedures comfortably while maintaining cardiorespiratory function and the ability to respond to verbal commands.³ By alleviating discomfort and reducing fear, conscious sedation helps foster a positive dentist-patient relationship, ultimately promoting better oral health outcomes.

Conscious inhalation sedation with nitrous oxide and oxygen is the gold standard in outpatient dentistry practice, for the rapid establishment and the equally rapid exhaustion of the sedative effect.⁴ Many dental practitioners may feel unprepared to administer sedation due to a lack of knowledge, training, or confidence in their clinical skills. This can result in a reluctance to utilize sedation techniques, particularly in pediatric cases, where the management of dental fear and anxiety is essential for successful treatment outcomes.

The present study aims to assess the knowledge, attitudes, and awareness of dental practitioners in Telangana regarding the use of conscious sedation in their practice.

MATERIAL & METHODS

After obtaining ethical clearance a cross-sectional study was conducted targeting 200 dental practitioners in Telangana, India. Sample size was estimated using the convenience sample technique. Snowball sampling technique was used to gather data (via email and WhatsApp Based). A self-

developed questionnaire was created, consisting of a total of 22 questions. (Annexure-1). Of these, 7 questions focused on demographic data, such as age, gender, and professional experience. The remaining 15 questions were designed to assess current knowledge, attitudes, and awareness of nitrous oxide inhalation sedation among dental professionals.

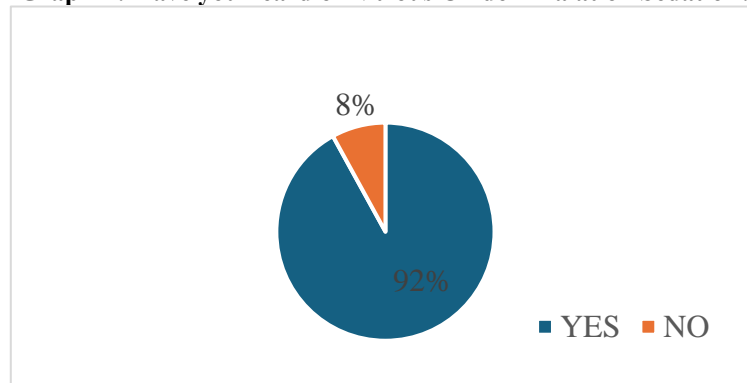
The questionnaire was validated by subject experts and their recommended changes were incorporated into the final version. Only fully completed questionnaires were included in the study. The collected data were tabulated and statistically analyzed.

RESULTS

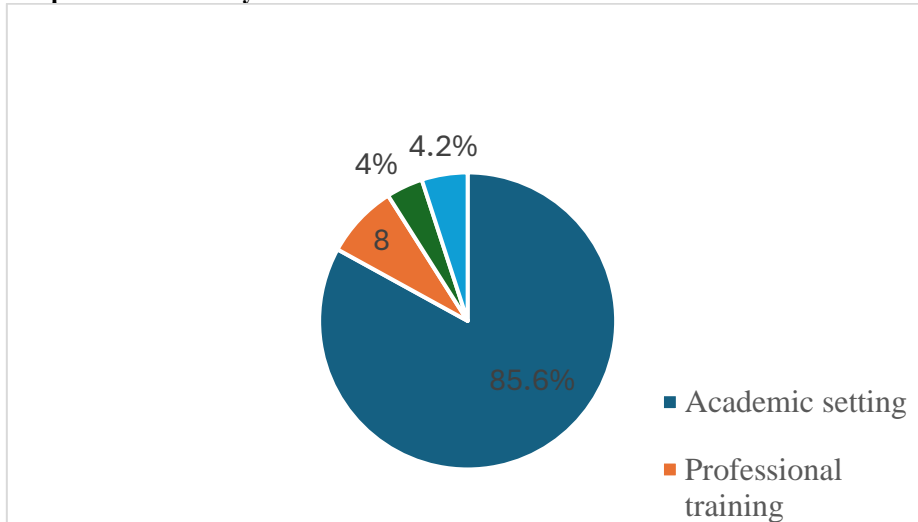
The obtained results were analyzed and interpreted in percentages. 200 dental professionals participated in the study among which 84% were Female and 16% were Male. 94% of dental professionals in Telangana were aware of different sedation types. 89.6% stated that local anesthesia is the most commonly used anesthesia technique in the dental office.

92% of dental professionals were familiar with nitrous oxide sedation. (Graph 1). 85.6% of these professionals reported that they were first introduced to nitrous oxide sedation during their academic education. (Graph 2) Anxiety reduction was cited by 75% as a primary indication for its use. (Graph 3) However only 33% felt confident in their knowledge of the proper administration technique. (Graph 4) and 56.4% considered it as safe practice. (Graph 5)

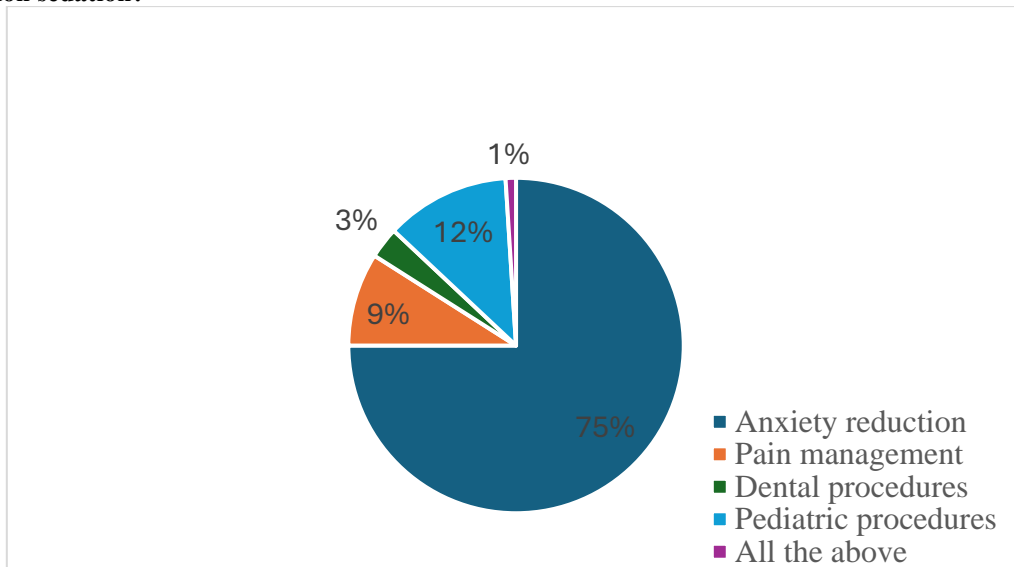
Graph-1: Have you heard of Nitrous Oxide Inhalation Sedation?



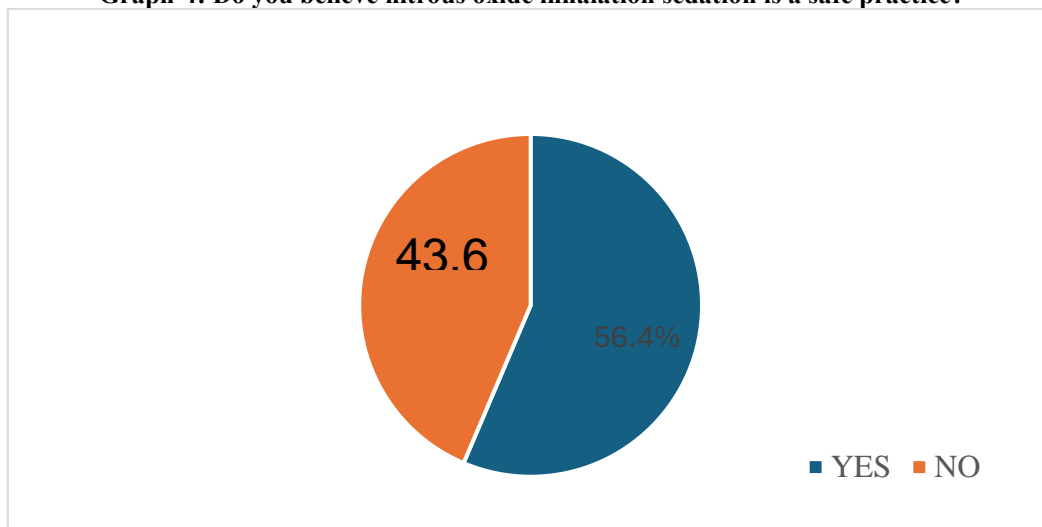
Graph -2: When did you know first about the Nitrous Oxide Inhalation Sedation?



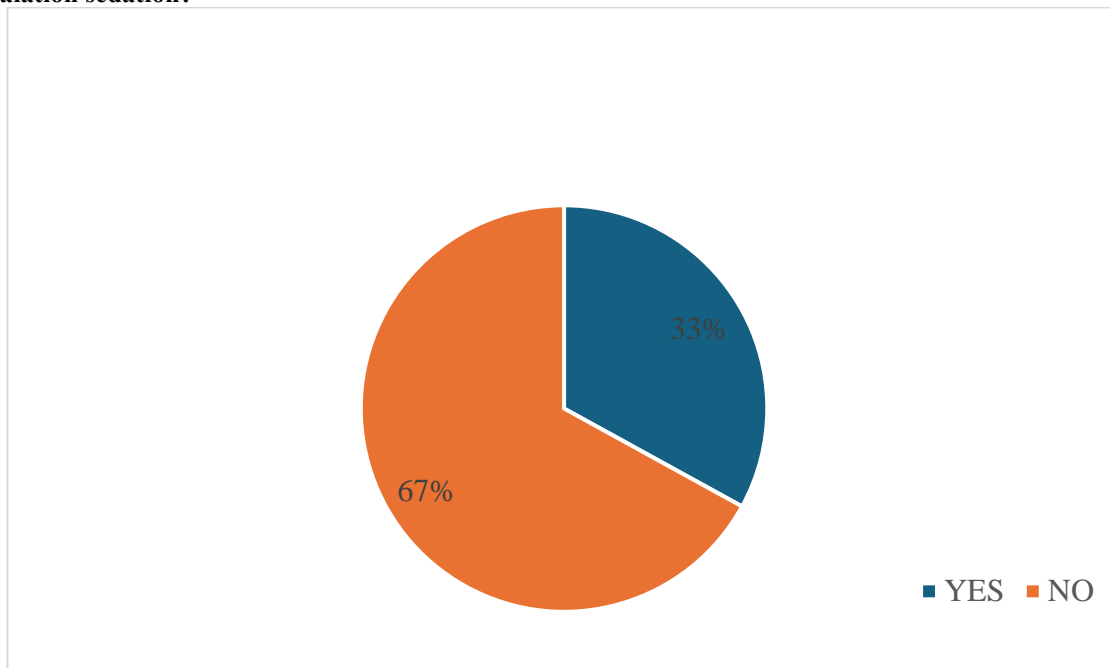
Graph-3: Which of the following do you believe are the primary indications for using nitrous oxide inhalation sedation?



Graph-4: Do you believe nitrous oxide inhalation sedation is a safe practice?



Graph 5- If you're practicing, Do you know the proper administration technique for nitrous oxide inhalation sedation?



DISCUSSION

Globally, the prevalence of dental anxiety in children and adolescents is estimated to range from 5% to 24%.⁽⁵⁻⁷⁾ This can lead to avoidance behaviors in patients, potentially resulting in poor oral health. Conscious sedation proves to be highly effective when non-pharmacological methods for managing anxiety are inadequate. Dental anxiety is the most common indication for conscious sedation. This type of sedation can also be utilized to safely treat individuals with medical conditions that may worsen due to stress, such as epilepsy or hypertension.

Khusbu et al⁸ conducted a study in which 98% of participants were aware of the use of nitrous oxide inhalation sedation (NOIS) in dental practice, whereas in the present study only 92 % were aware of conscious sedation. A study conducted by V. Ranjith Akshay Seshadri et al⁹ 61.9% of the dental practitioners suggest that conscious sedation is one of the safest procedures in dentistry especially in cases of pediatric patients whereas in our study only 56.4% considered it as safe. According to Daher et al¹⁰, the most cited indications for NOIS were fearful and/or anxious patients, similar results with 75% were obtained in this study.

Only 33% of the respondents were proficient in the proper administration techniques. This might be because the 70.6% respondents were of general dentists.

This study highlights the importance of strengthening both theoretical knowledge and clinical training for dental practitioners to deliver high-quality care. Consequently, educational programs on conscious sedation should be introduced to enhance awareness and ensure safe and effective practices.

The limitation of the Present study was confined to a single state, Telangana. Conducting a nationwide survey with a larger and more diverse sample size could provide a more comprehensive understanding of practitioner's perspectives, attitudes, and perceptions regarding the use of conscious sedation in India

CONCLUSION

This study highlights a notable disparity between awareness and practical expertise in the use of conscious sedation among dental practitioners, particularly general dentists. Irrespective of their qualification, all practitioners must have knowledge on conscious sedation, so that they can educate about it to the patient and get the correct

treatment done. This underscores the importance of enhancing education and hands-on training in sedation practices to ensure safe and effective implementation in dental practice.

Declaration by Authors

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REFERENCES

1. Monisha.K *et al* (2017) ' Knowledge, Attitude And Practice On Conscious sedation In Children Among Dental Practitioners. International Journal of Current Advanced Research, 06(04), pp. 3033-3036. DOI: <http://dx.doi.org/10.24327/ijcar.2017.3036.0172>
2. American Academy of Pediatric Dentistry. Use of nitrous oxide for pediatric dental patients. The Reference Manual of Pediatric Dentistry. Chicago, Ill.: American Academy of Pediatric Dentistry; 2024:394-401.
3. Craig, D. C., and J. A. W. Wildsmith. 2007. "Conscious Sedation for Dentistry: An Update." *British Dental Journal*. <https://doi.org/10.1038/bdj.2007.1105>.
4. Naseemoun Shaik, Sriharsha Pudi. Knowledge and awareness of undergraduate dental students about conscious sedation in dental practice: a cross sectional survey study. International Journal of Research and Review. 2023; 10(4): 554-556. DOI: <https://doi.org/10.52403/ijrr.20230469>.
5. S. Alaki, A. Alotaibi, E. Almadadi, and E. Alanquri, "Dental anxiety in middle school children and their caregivers: prevalence and severity," *Journal of Dentistry and Oral Hygiene*, vol. 4, pp. 6–11, 2012.
6. G. Klingberg, U. Berggren, and J. G. Nor'en, "Dental fear in an urban Swedish child population: prevalence and concomitant factors," *Community Dental Health*, vol. 11, no. 4, pp. 208–214, 1994.
7. S. M. Popescu, I. T. Dascalu, M. Scriciu, V. Mercut, I. Moraru, and M. J. Tuculina, "Dental anxiety and its association with behavioral factors in children," *Current Health Science Journal*, vol. 40, no 4, pp. 261–264, 2014.
8. Chawla, Khushbu & Kariya, Pratik & Tailor, Brijesh & Singh, Sweta. (2021). Knowledge, Attitude, and Awareness about Nitrous Oxide Inhalation Sedation among Dental Practitioners of Gujarat, India. *Journal of Pharmaceutical Research International*. 302-308.
9. V. Ranjith Akshay Seshadri, EMG Subramanian, (2022). Knowledge, Attitude and Awareness of Conscious Sedation Among Dental Practitioners - A Survey. *Journal of Coastal Life Medicine*, 10, 71.
10. Daher, A., Lima Hanna, R. P., Costa, L. R., & Leles, C. R. (2012). Practices and opinions on nitrous oxide/oxygen sedation from dentists licensed to perform relative analgesia in Brazil. *BMC Oral Health*, 12, 21.

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Annexure-1 (Questionnaire)

*Name

*Email id

*Phone no

* Age:

< 25

25-35

36-45

- 46-55
- 55

*Gender:

- Male
- Female

*Educational Qualification:

- B.D.S
- M.D.S

* Practicing since-years

- <5 years
- >5 years
- >10 years
- >20 years

1.Do you know about different types of sedation?

- Yes
- no

2.Which is the most common sedation used in dentistry?

- Local anaesthesia
- General anaesthesia
- Conscious sedation

3.What is the most effective route for administering conscious sedation?

- Oral
- Nasal
- Intravenous
- intramuscular

4.Have you heard of nitrous oxide inhalation sedation?

- Yes
- No

5. When did you know first about the nitrous oxide inhalation sedation?

- Academic setting
- Professional training
- Colleagues
- Media

6 Which of the following do you believe are the primary indications for using nitrous oxide inhalation sedation?

- Anxiety reduction
- Pain management
- Pediatric procedures
- Dental procedures
- Other

- 7 Which of the following are potential contraindications for nitrous oxide inhalation sedation?
- Respiratory conditions
 - Pregnancy
 - Bowel obstruction
 - Mouth breathers
 - Vitamin B12 deficiency
 - None of the above
 - Not sure
8. Do you believe nitrous oxide inhalation sedation is a safe practice?
- Yes
 - No
9. Are you aware of the safety protocol associated with nitrous oxide inhalation sedation?
- Yes
 - No
10. If you're practising, Do you know the proper administration technique for nitrous oxide inhalation sedation?
- Yes
 - No
11. What factors influence your decision to use or not use nitrous oxide inhalation sedation ?
- Patient's age
 - Patient's medical history
 - Level of patient anxiety
 - Cost
 - Availability of equipment
 - Personal Knowledge and comfort
12. Do you inform patients/guardians about nitrous oxide inhalation sedation as an option?
- Always
 - Sometimes
 - Rarely
 - Never
13. What do you consider to be the main advantages of using nitrous oxide inhalation sedation?
- Reduces patient anxiety
 - Quick onset and recovery
 - High safety with minimal side effects
 - Improves patient cooperation
 - Noninvasive
 - Adjustable sedation levels
 - Retains protective reflexes
14. Have you encountered any complications while using nitrous oxide inhalation sedation?
- Yes
 - No

15. If yes, please specify the type of complication:

- Respiratory distress
- Nausea/Vomiting
- Prolonged sedation
- Equipment failure
- Other

16. Does nitrous oxide inhalation sedation effectively reduce patient anxiety and enhance comfort during dental procedures?

- Agree
- Neutral
- Disagree
- Strongly disagree
