



Awareness on the Use of Intravenous Sedation for Periodontal Surgeries - A Questionnaire Based Study

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Authors' contributions

This work was carried out in collaboration between both authors. Author PKI designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors MT and PKI managed the analyses of the study, the literature searches. Both authors read and approved the final manuscript.

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ABSTRACT

Conscious sedation is a valuable approach to address anxious patients and treat them with the utmost comfort level. Thus the knowledge regarding the practice of conscious sedation among dental practitioners seems to be the need of the hour with increasing patient demands. This study aims to assess the knowledge, awareness and practice of conscious sedation for periodontal surgeries among dental practitioners. This questionnaire based study was conducted in the form of an online survey. A structured questionnaire with 20 questions in the area of its indications and contraindications, various drugs used in conscious sedation and the side effects of these drugs were included. The results showed that only 51% of the participants chose to use conscious sedation when dealing with anxious patients. Also 58.9% of the study population considered

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conscious sedation as an option when the patient is extremely uncooperative due to anxiety and for patients who have a lesser threshold of pain. 64.4% are aware that conscious sedation brings a partial loss of consciousness with response to verbal and physical stimulus. Within the limits of the study it can be concluded that there is a moderate level of awareness regarding practice of conscious sedation among the dental practitioner. Practitioners in urban and suburban areas who have recently graduated seem to have a better awareness and interest in practice of conscious sedation than others.

Keywords: Sedation; intravenous; pain; anxiety; periodontal therapy.

1. INTRODUCTION

Sedation is a technique where one or more drugs are used to depress the central nervous system of a patient thus reducing the awareness of the patient to his surroundings [1]. This enables treatment to be carried out easily without any hindrance from the patient. Sedation is usually divided into conscious and deep sedation, conscious sedation being a state in which the patient responds to verbal and physical stimulus, while still remaining in a sedated state while deep sedation being a state in which the patient is unconscious [1]. The last decade has seen major changes in the management of pain and anxiety in dentistry [2]. Now, multiple drugs with various advantages over one another have been synthesized which makes it easier and safer to use conscious sedation in daily practice. This added with the fact that most drugs can be delivered through multiple routes, makes them more accessible. Conscious sedation is used especially in cases where the patient shows anxiety before the procedure. Anxiety is a natural response which arises due to the fear of the unknown and this causes a lot of difficulty for the dentist. Pain and fear may lead to extreme fluctuations in blood pressure and heart rate which can cause serious complications like vasovagal reactions [3]. Multiple studies have suggested the use of intravenous sedation for dental surgical procedures in patients with high anxiety levels as a viable method to control anxiety [4]. Periodontal surgeries are one of the most feared procedures in dentistry with one study showing 68.2% preferring sedation or general anesthesia for periodontal surgeries while only 46.5% preferred sedation or general anesthesia for tooth extraction [5]. In 1993, the American Association of Periodontology (AAP) began encouraging postgraduate periodontal programs to train residents in the use of conscious sedation, and in the subsequent year, they offered a training course for all periodontal program

faculties on the use and practice of conscious sedation [6].

Previously we have worked on plenty of topics in periodontology [7–19]. Now we are planning our research work in intravenous sedation in periodontal surgeries. The purpose of this study was to assess the knowledge, awareness and practice of intravenous conscious sedation prior to periodontal surgeries among dental practitioners.

2. MATERIALS AND METHODS

This questionnaire based study was conducted in the form of an online survey. After obtaining approval from the institutional ethical committee (SRB/SDC/UG-Prosthodontics/19/01), structured questions regarding conscious sedation, its indications and contraindications, various drugs used in conscious sedation and the side effects of these drugs were prepared and included in a questionnaire and was sent to the participants after validation of the questionnaire was done by an external reviewer who were selected based on the following criteria.

2.1 Inclusion Criteria

- Postgraduate students studying in Chennai
- General dentists with a BDS (Bachelor of Dental Surgery) degree who have a clinical practice set up in Tamil Nadu with a minimum 1 year of experience.
- Specialists dentists (MDS (Master of Dental Surgery)) who have a clinical practice set up in Tamil Nadu with a minimum 1 year of experience.

2.2 Exclusion Criteria

- Undergraduate students
- Retired dentists

A total of 202 questionnaires which satisfied the inclusion and exclusion criteria were recruited for the study. Since the questionnaire was distributed in the form of an online survey, all the questions were made compulsory to negate the creation of incomplete questionnaires. Their responses were noted down in Microsoft Excel 2016 (Microsoft Office 10) and later exported to the Statistical Package for Social Science for Windows (Version 20.0, SPSS Inc., Chicago, Illinois, USA). The results were statistically analyzed using Chi Square Test, p value of less than 0.05 was considered to be statistically significant.

3. RESULTS AND DISCUSSION

Out of the 202 participants in this study, the majorities were females (60.9%) and the remaining were males (39.1%). While most of the study population (64.35%) fell in the age group of 25-35 yrs, 23.26% in 36-45 yrs and 12.39% in 46-55 yrs age. General dentists represented the majority of the study population (56.93%) which was followed by postgraduate students (33.16%) with the remaining being specialists (9.91%). The most common years of experience of the participants was 0-8 years (75.74%) which was preceded by participants with 9-16 years (14.85%) and participants with 17-24 years

(9.4%). When area of practice was considered, 51.48% had their clinical practice set up in an urban area, 38.11% in a suburban area and the remaining 10.19% in a rural area.

Conscious sedation is a valuable approach to address anxious patients and treat them with the utmost comfort level. Thus the knowledge regarding the practice of Conscious sedation among dental practitioners seems to be the need of the hour with increasing patient demands. Table 1 shows the various responses to selective questions of the survey. In this study, it was found that only 51% of the participants chose to use conscious sedation when dealing with anxious patients (Fig. 1). This is similar to the study by Tingey et al who showed 49.8% of the participants to be practicing IV sedation [6]. Literature evidence shows that conscious sedation is a better option to manage anxious patients [6]. When asked for the ideal candidate for practicing conscious sedation, only 41.1% of the participants chose systemically healthy patients (Fig. 2) which shows low awareness about the importance of the condition of health while administering conscious sedation. A study by Peden et al showed increased risks in administering conscious sedation in patients with systemic illnesses [20].

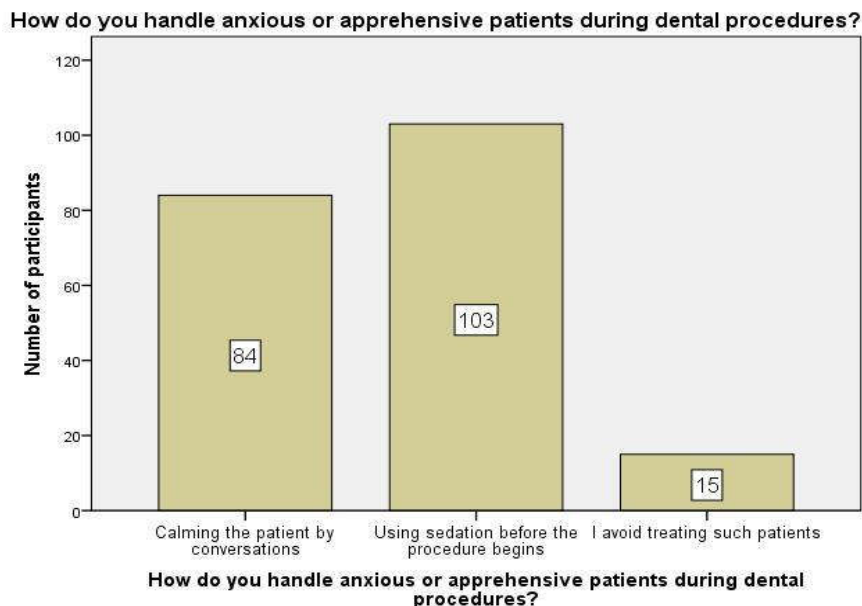


Fig. 1. Bar graph representing the responses to how the participants handle anxious or apprehensive patients during dental procedures?" The X axis represents the different responses for the particular question and the Y axis represents the number of responses.

41.5% of the participants prefer calming the patients by conversations, 50.9% of the participants use sedation before the procedure. The remaining 7.4% said that they avoid treating such patients

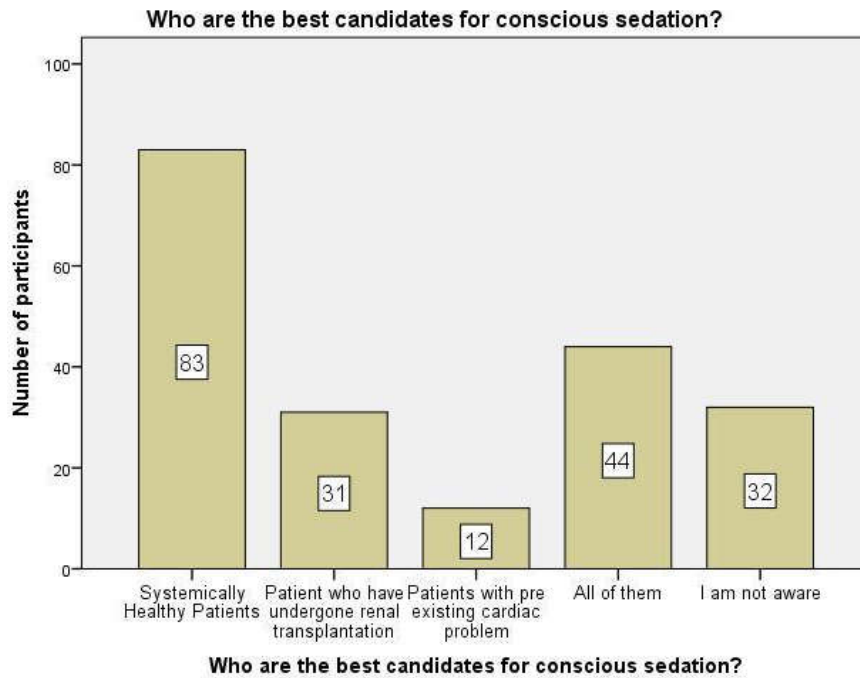


Fig. 2. Bar graph representing the responses to who the participants thought are the best candidates for conscious sedation. The X axis represents the different responses for the particular question and the Y axis represents the number of responses. 41.1% of the participants chose systemically healthy patients, 15.3% chose patients who have undergone renal transplant. 5.9% chose patients with pre-existing cardiac problems, 21.7% said all the patients were good candidates and 15.8% were not aware

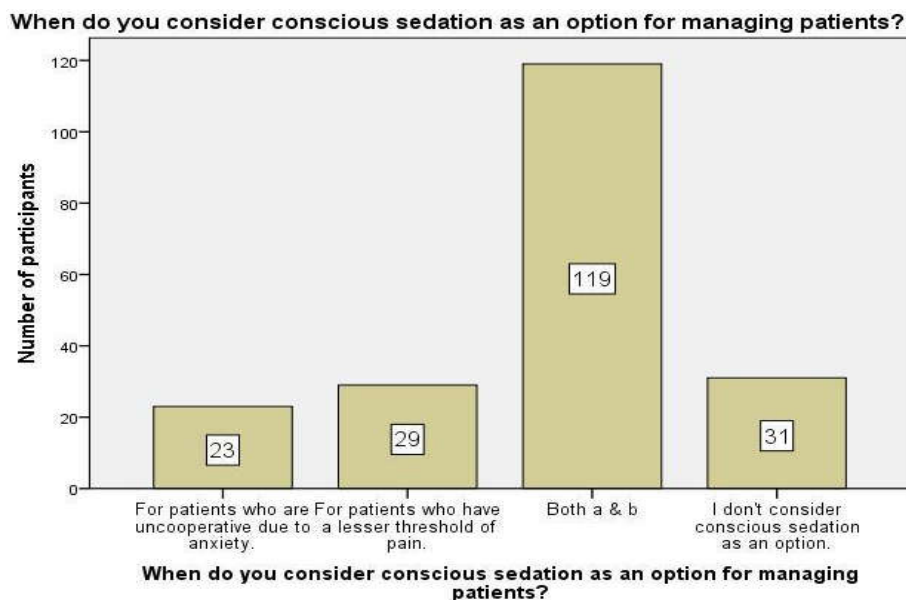


Fig. 3. Bar graph representing the responses to the when do the participants consider conscious sedation as an option for managing patients. The X axis represents the different responses for the particular question and the Y axis represents the number of responses. 11.3% consider conscious sedation for patients who are uncooperative due to anxiety, 14.3% consider conscious sedation for patients who have a lesser threshold of pain, 58.9% consider conscious sedation for patients that fall under both the previous options and the remaining did not consider conscious sedation as an option



Fig. 4. Bar graph representing the responses to what restricts the participants from practicing conscious sedation. The X axis represents the different responses for the particular question and the Y axis represents the number of responses. 8.4% of the participants said that it was not affordable for their patients, 34.6% of the participants do admit that they did not have adequate knowledge to practice conscious sedation, 16.3% said that they felt conscious sedation to be risky in dental practice and the remaining considered conscious sedation as an option in behavioural management

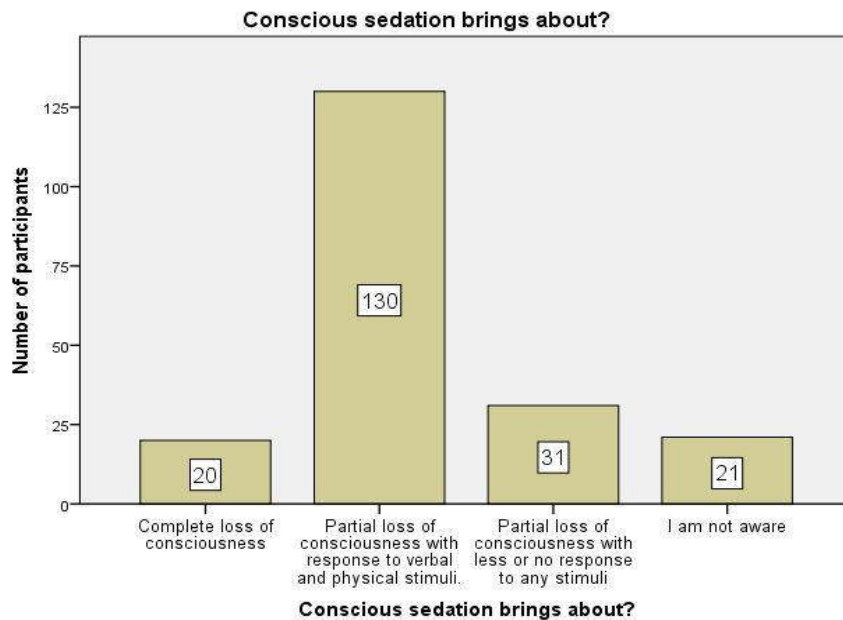


Fig. 5. Bar graph representing the responses what the participants thought conscious sedation brings about. The X axis represents the different responses for the particular question and the Y axis represents the number of responses. 9.9% of the participants thought conscious sedation brought about complete loss of consciousness, 64.3% of the participants thought conscious sedation brought partial loss of consciousness with response to verbal and physical stimuli, 15.3% thought that conscious sedation brought partial loss of consciousness with less or no response to any stimuli and the remaining were not aware

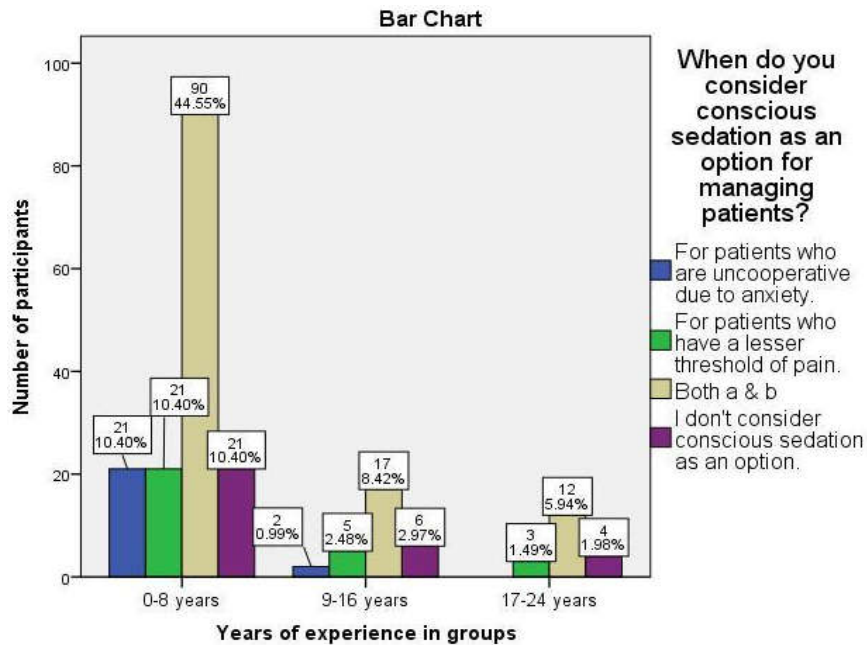


Fig. 6. Bar graph showing association between years of experience and the conditions in which the participants opt for conscious sedation. X axis represents the years of experience of the participants and the Y axis represents the number of participants responding to a particular choice. Chi Square test was done and the p value was found to be 0.56 ($p > 0.05$) which is statistically not significant. This shows that dentists who have recently graduated are more likely to prefer conscious sedation than experienced practitioners

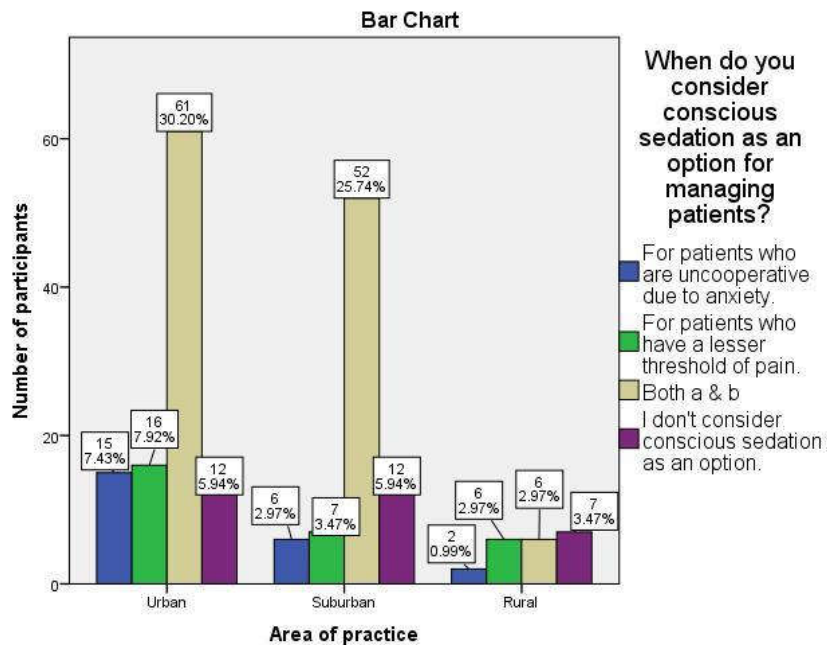


Fig. 7. Bar graph showing association between area of practice of participants and the conditions in which the participants opt for conscious sedation. X axis represents the area of practice of the participants and the Y axis represents the number of participants responding to a particular choice. Chi Square test was done and the p value was found to be 0.014 ($p < 0.05$) which is statistically significant. This shows that dentists practicing in urban areas prefer sedation for managing anxious patients over suburban or rural area

Age:
Gender:
Post graduate student/ General Dentist/ Specialist
Years of experience:
Area of practice: Urban/ Suburban/ Rural

- How do you handle anxious or apprehensive patients during dental procedures?
 - Calming the patient by conversations
 - Using sedation before the procedure begins
 - I avoid treating such patients
- Do you consider conscious sedation to be a better alternative for managing anxious or apprehensive patients?
 - Yes
 - No
 - I am not sure
- Who are the best candidates for conscious sedation?
 - Systemically Healthy patients
 - Patient who have undergone renal transplantation
 - Patients with pre existing cardiac problem
 - All of them
 - I am not aware
- When do you consider conscious sedation as an option for managing patients?
 - For patients who are uncooperative due to anxiety.
 - For patients who have a lesser threshold of pain.
 - Both a & b
 - I don't consider conscious sedation as an option.
- How often do you practice conscious sedation in your practice?
 - Very often
 - Often
 - Sometimes
 - Rarely
 - Never
- What does restrict you from practising conscious sedation?
 - Not affordable for my patients
 - I do not have adequate knowledge to practice it
 - I feel it to be risky for dental practice
 - I consider conscious sedation as an option
- Who sedates your patient in your dental practice?
 - An anaesthesiologist
 - myself
 - Both
 - I am not aware
- Have you undergone any training for administering conscious sedation?
 - Yes
 - No
- Can any dentist administer conscious sedation without prior training?
 - Yes
 - No
 - I am not aware
- What are the most common routes of conscious sedation you use?
 - Oral
 - Intravenous
 - Inhalation
 - I am not aware
- Conscious sedation brings about?
 - Complete loss of consciousness
 - Partial loss of consciousness with response to verbal and physical stimuli.
 - Partial loss of consciousness with less or no response to any stimuli
 - I am not aware
- What is the most frequently used drug for oral sedation?
 - Triazolam
 - Midazolam
 - Both Triazolam and Midazolam
 - I am not aware
- In which group of patients inhalation sedation (nitrous oxide) is commonly used?
 - Children
 - Adults
 - Elderly
 - Both children and elderly
- What is the sign of a correct level of sedation when the sedative is administered intravenously?
 - Drooping of the eyelids
 - Patients responding to verbal commands or mild physical stimulation even with the eyelids closed.
 - I am not aware
- What is the most common drug used for intravenous conscious sedation?
 - Midazolam
 - Dexmedetomidine
 - Propofol
 - Ketamine
 - Diazepam
 - I am not aware
- What are the disadvantages of using conscious sedation?
 - The drugs can have untold side effects(Amnesia, drowsiness, decrease in blood pressure)
 - Sedatives might interact with any medication the patient is consuming in a negative manner.
 - Cannot be used on patients who are allergic to sedatives.
 - All of the above
 - I am not aware
- What do you think is the complication of conscious sedation?
 - Adverse physiological effects(infectivity in tranquilizing patients, seizures)
 - Pain on injection
 - Severe respiratory insufficiency
 - Myasthenia gravis
 - Both
 - I am not aware

Fig. 8. Showing the structure of the questionnaire used in the study

Table 1. Table representing the various responses by the participants of this study to selective questions

Questions	Options				
How do you handle anxious or apprehensive patients during dental procedures?	Calming the patients by having conversations	Using sedation before the procedure begins	I avoid treating such patients.		
	41.5%	50.9%	7.4%		
Who are the best candidates for conscious sedation?	Systemically Healthy Patients	Patient who have undergone renal transplantation	Patients with pre-existing cardiac problem	All of these	I am not aware
	41.1%	15.3%	5.9%	21.7%	15.8%
When do you consider conscious sedation as an option for managing patients?	For patients who are uncooperative due to anxiety	For patients who have a lesser threshold of pain	Both a & b	I don't consider conscious sedation as an option.	
	11.3%	14.3%	58.9%	15.3%	
What does restrict you from practicing conscious sedation?	Not affordable for my patients	I do not have adequate knowledge to practice it.	I feel it to be risky for dental practice	I consider conscious sedation as an option	
	8.4%	34.6%	16.3%	40.6%	
Conscious sedation brings about?	Complete loss of consciousness	Partial loss of consciousness with response to verbal and physical stimuli	Partial loss of consciousness with less or no response to any stimuli	I am not aware	
	9.9%	64.3%	15.3%	10.4%	

Only 58.9% considered conscious sedation as an option when the patient is extremely uncooperative due to anxiety and for patients who have a lesser threshold of pain (Fig. 3) which shows marginally better understanding of the indications. When asked about the frequency of use of conscious sedation, 43.6% of the participants said that they practiced conscious sedation at times. This is similar to the report by Goodchild et al where he stated dentists perform conscious sedation rarely in their practice [21].

Out of the 40.59% which did not practice conscious sedation, 58.3% said that they lack the knowledge required as the reason for not practicing it (Fig. 4). This could be due to the relatively high number of postgraduates who took part in the study. A study by Goodchild et al showed that out of the 24% who did not practice conscious sedation, 74% were not interested in providing their patients with sedation [21].

64.4% said that conscious sedation brings a partial loss of consciousness with response to verbal and physical stimulus (Fig. 5). This shows

a good amount of knowledge regarding the effect conscious sedation has on the body. When asked about the most common drug used intravenously, only 14.4% answered midazolam. This shows very poor knowledge about the drugs used in conscious sedation. Midazolam is considered to be one of the most widely used sedatives [22]. However, dexmedetomidine has been shown to be an effective drug for sedation, despite being relatively new [23]. Finally, when asked about a major complication of conscious sedation, only 20.3% chose pain on injection as the major complication. In a study done by Wright et al, pain during administration of the sedative was extensively reported [24].

In this study 58.82% participants with 0-8 years of experience, 56.66% of participants with 9-16 years of experience and 63.15% of participants with 17-24 years of experience were aware of the indication for conscious sedation correctly (Fig. 6). 58.64% of participants from an urban area and 67.53% of participants from a suburban area identified the correct indication. However, the awareness regarding indication was more among

dentists practicing in urban and suburban areas (Fig. 7). Although this technique is useful, it has its disadvantages. Few studies suggest alteration of the respiratory rate while the patient is seated [25], but a study done by Shivananda et al showed no difference in the rate of respiration during periodontal surgeries [26]. A small sample size with restricted geographic diversity and not including a larger population of the older participants are the limitations of the study.

4. CONCLUSION

Within the limits of the study it can be concluded that there is a moderate level of awareness regarding practice of conscious sedation among the dental practitioner. Practitioners in urban and suburban areas who have recently graduated seem to have a better awareness and interest in practice of conscious sedation than others.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

CONSENT

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

Ethical approval has been collected from the institutional ethical committee (SRB/SDC/UG-Prosthodontics/19/01).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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