Medical and Research Publications
International Open Access

Research Article **Journal of MAR Dental Sciences (Volume 6 Issue 5)**

Use and Knowledge of Sedation Among Children: A National Survey of Private Dental Practitioners.

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Received Date: December 01, 2022

Published Date: December 15, 2022

Abstract

Introduction: *Dental fear and anxiety can be conveniently reduced by sedation. Practitioners should have knowledge about current recommendations before prescribing sedative drugs. In the particular case of pediatric dentistry, prescribing requires special attention. The present study was conducted in this context.*

Methods: *A descriptive study involving 154 free-practice dentists was conducted. It was performed using a questionnaire. Our objective was to assess the most common sedative drugs and procedures provided in dental offices through an anonymous questionnaire.*

Results: *This study showed that 89% of respondents did not use any of the sedation approache of the respondents, 11% had attended post-graduate training. The most prescribed premedicant was Benzodiazepines. Approximately, 64. 9% of the practitioners surveyed correctly answered the optimal dosage of H1 antihistamines and it was the dentists specializing in this area who have the most adequate management (p=0.005). Only 19 practitioners revealed that they had received Training in conscious sedation using an equimolar mixture of oxygen and nitrous oxide (EMONO) inhalation.*

Conclusion: *This survey revealed a poor mastery of the recommendations and a lack of knowledge on the part of dentists. However, the data and conclusions of our study need to be completed in order to be able to extrapolate on a national scale.*

Key Words*: Sedation, Child, Survey, Pediatric Dentistry.*

Abbreviations

ADA: American Dental Association

EMONO: equimolar mixture of oxygen and nitrous oxide

mg: Milligram

Kg: Kilogram

d: day

Introduction

The management of dental fear and anxiety is commonly a major issue, particularly in the case of pediatric patients (De Stefano et al.). Surveys have reported that anxious patients may seek dental treatment if sedation was provided, and they consider sedation as one of the preferred treatment options (Goodchild et Donaldson). In fact, sedation is defined as a depression of a patient's consciousness to the environment and depletion of his or her reaction to external stimulation (Rex).

This procedure is based on the use of sedative, analgesic, and dissociative drugs to provide analgesia, sedation, and motor control during painful diagnostic and therapeutic approaches. During the past 20 years, this procedure has advanced in a distinct skill set with a growing number of indications and practice settings (Krauss et Green).

The use of sedation for children's management certainly requires precautions in order to avoid potential side effects associated with this technic, especially since the children's organisms are not as mature as those of adults.

According to the American Dental Association (ADA), practitioners using procedural sedation should have adequate knowledge of the pharmacology of the agents used (Meyer).

The aim of this study was to assess the practice of sedation by Tunisian private dental practitioners. Their knowledge of this field was also investigated.

Materials and Methods

Study presentation

Study design

A descriptive cross-sectional study was conducted based on an online survey questionnaire that targeted private dental practitioners.

Study area and duration

The questionnaire form was addressed to the dentists through the available dentist groups on social media.

The survey was performed from April 8, 2020, to May 12, 2020. In fact, it was divided into two parts:

- First period: from 8 April to 28 April, corresponding to the first sending of the questionnaire.
- Second period: from 29 April to 12 May, corresponding to the second sent of the questionnaire or recall.

Sample and target population

The study sample consisted of 154 private dental practitioners in Tunisia.

Inclusion criteria

Qualified dentists practicing in a dental office, liberals (owners of the practice), and employees (working on a second dental chair or as replacements), in Tunisia, were included.

Non-inclusion criteria

Interns and hospital practitioners were excluded. If some of them received the questionnaire, an explanatory message that invited them not to answer was mandatory.

Data collection

For reasons of Covid-19 transmission, economy, and practicality we preferred to send questionnaires online.

To avoid selection bias, the questionnaire form was addressed to the overall practitioners through dentist groups on the social networks.

Questionnaire

The questionnaire form regrouped various medicines frequently prescribed in dental offices: antibiotics, at-risk patients, analgesics, sedation procedures, Fluoride, antifungals.

However, the present paper described only the assessment of different sedation procedures. In fact, the questionnaire form was created on the google forms software, ensuring data storage on the server and anonymity of respondents to avoid biased results.

The questionnaire was divided into two parts:

- Identification part: sex, age, original university, graduation date, professional status…
- Sedation procedures part: the following points were assessed:

– Frequency of the use.
– Dentists' attitude to post-graduate sedation training.
– Oral sedative premedication.
– Training in conscious sedation using an equimolar mixture of oxygen and nitrous oxide (EMONO) inhalation.

Statistical analysis

The data collection and the statistical data analyses were carried out using version 22 of SPSS software 21 (IBM Corp, NY, USA).

The chi-square test was used to determine the various correlations between the different parameters assessed in this study. The results were accounted significant at a p-value<0.05.

Results

General Data

Sample characteristics

Gender and age distribution of the sample

A final count of 154 practitioners completed and returned the survey. Of respondents, 59.70% (N= 92) were male and 40.30% (N= 62) were female. The most frequent age group was 30 to 45 years old, representing 53.9% of the participants while the less frequent was that over 60 years old, representing 1.3% of the participants.

Sample distribution by study location

90.9% of respondents have completed their initial instruction at the Monastir Faculty of Dentistry. The remaining practitioners have achieved their initial training in Romania (3.2%), in French (0.6 %), 1.3% of participants have completed their training in each of Russia, Ukraine, Algeria and Senegal

Distribution of the participants by the place of exercise

Of respondents, 74.7% reported practicing in urban areas, while only 7.8% reported practicing in rural areas.

Sample distribution by practice type (general practitioner/specialist)

Most of the participants were qualified as general practitioners, representing 90.3 % of the total respondents. Among the respondent specialists, 5.2% were pediatric dentists.

Sample distribution by practice mode

The participants practice was mainly liberal (dental practice owners) representing 90.90% of the overall respondents.

Sedation in the dental office

Frequency of practice

Approximately, 90% of investigated respondents did not use sedation.

Dentists' attitude to post-graduate sedation training

Most of the participants (67.5%) reported that post-graduate sedation trainings were highly mandatory to adequately exercise sedation procedures. Among them, 10 attended post-graduate trainings and 7 respondents who attended educational courses but they did not express any judgement about their benefits. Finally, 33 respondents did not attend any training.

Oral sedative premedication

Favored drug

98 participants provided us with the common medicine name used in their exercise. The current study found that the main sedative drug commonly prescribed was Benzodiazepines followed by H1-antihistamines (Tab.1).

Dosage of the drugs

Among the 60 practitioners who prescribed Benzodiazepines, 63.3% prescribed the dosage of 1 mg/kg/d (Fig. 1)

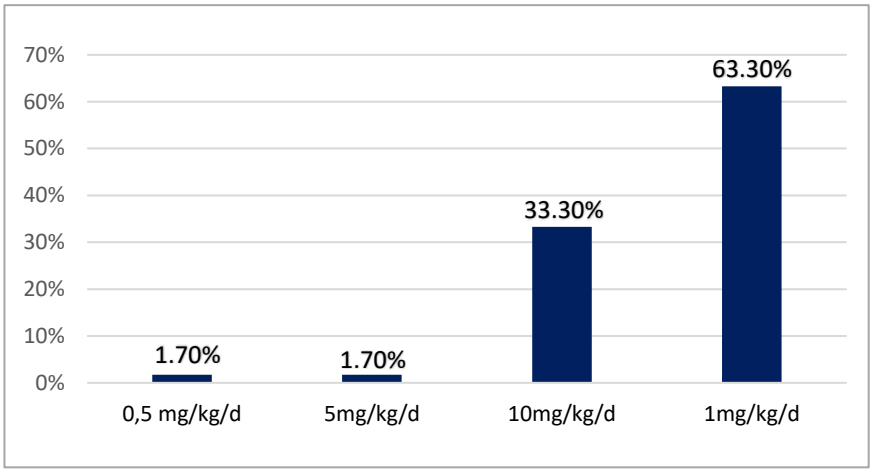

Figure 1: Prescribed dosage of Benzodiazepines.

Among the 38 practitioners who advised the H1-antihistamines, 64. 9% reported the prescription of 1 mg/kg/d, 32. 4% prescribed the dosage of 10 mg/kg/d, and the remaining 2.7% prescribed the dosage of 25 mg/d.

Schedule of the sedative premedication's intake

Of respondents, 27% of participants reported that they indicated the taking of the premedication twice: the night before and one hour before treatment. Approximately, 29% of participants prescribed the premedication only one hour before treatment. A minority (7.8 %) reported that they indicated the taking of drugs only the night before the dental appointment (Table.2).

Training in conscious sedation using an equimolar mixture of oxygen and nitrous oxide (EMONO) inhalation

Training of participants in EMONO

Due to the increasing interest in EMONO recently, we asked the participants about their training in this field. Only 19 practitioners (12.3%) revealed that they had received training in the EMONO procedures.

Training of the staff in EMONO

Even if a practitioner was well trained, this did not positively impact the training of its staff, who presented usually limited training in this topic (Tab.3).

Set of recommendations suggested by the participants

After the EMONO session, 14 participants made oral recommendations to their patients. Among them, 4 additionally wrote them. One other striking finding was that 4 participants did not make any type of recommendations (Table.4).

- Examples of tips: Among the recommendations made by practitioners, we found mainly the psychological preparation of the child and recommendations about the drug intake (Fig.2).

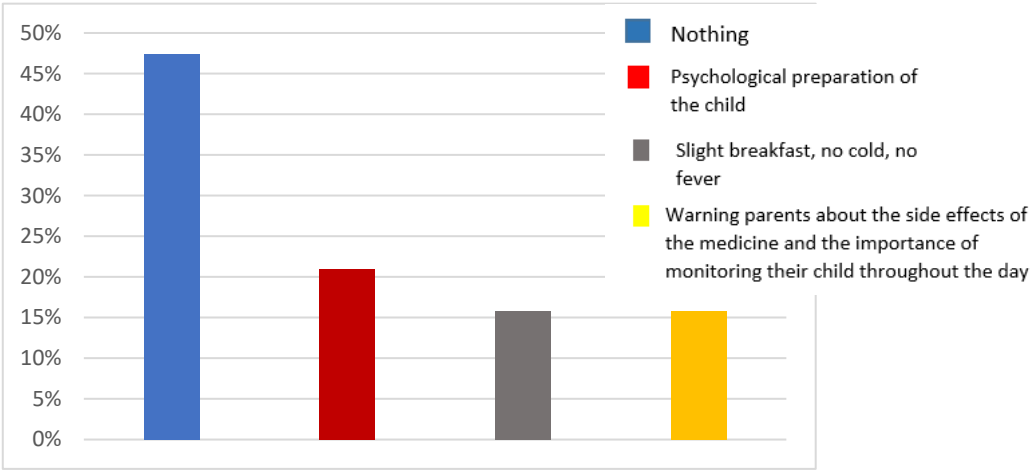

Figure 2: Examples of recommendations made by the practitioners

Association between the adequate dose of H1-antihistamines and some sample characteristics.

The statistical association between the adequate dose of H1-antihistamines and some of sample characteristics are represented in the following table (Table.5). As shown in the table, the adequate dose was significantly associated with the practice type ($p = 0.005$).

Favoured drug	Number	Percentage (%)
H1-antihistamines	38	24
Benzodiazepines	60	39

Table 1: Preferred medicine for participants

Timing	Number	Percentage (%)
About one hour before treatment	44	28.6
The night before	12	7.8
Both	42	27.2
No prescription	56	36.4
Total	154	100.0

Table 2: Timing of premedication intake

Are your staff trained in EMONO?	Percentage (%)
No	9.1
Yes	1.9
You are working individually	1.3
No reply	90.3
Total	100

Table 3: Training of the staff in EMONO

Recommendations	Percentages (%)
Written	0.6
Oral	6.5
Written / Oral	2.6
No recommendation	2.6

Table 4: Set of recommendations suggested by the participants

Drug / Sample characteristics	H1-antihistamines
Original faculty	**0.249**
Years of experience	**0.576**
Practice type	**0.005**
Practice mode	**0.267**
Training of participants	**0.204**
Have you the habit of updating your knowledge about the adequate use of sedative medicines	**0.264**

Table 5: Association between the adequate dose of H1-antihistamines and a variety of sample characteristics

Discussion

The present survey aimed to assess the attitude of private dental practitioners to sedative procedures and prescriptions among children. Our findings highlight a lack of knowledge about this topic and a lack of practice of sedation procedures. Practitioners were mostly young as the age group ranged from 30 to 45 years was predominant, with the percentage of 53.9%.

Most of the participants (90.9%) have completed their initial instruction at the Monastir Faculty of Dentistry. Currently, the participants' practice was predominantly represented by general practitioners (90.3%), liberal (90.9%), and located in urban areas (74.7%), those findings are consistent with the findings of AI-Johani et al (Al-Johani et al.). Few practitioners (6%) had received post-academic training in pediatric dentistry.

The management of anxiety and fear of children experiencing dental problems is commonly a major issue resulting in challenging dental management not only for the patients but also for the practitioners. According to the survey conducted by Wilson and Alcaino (Wilson et Alcaino) among members of the International Association of Pediatric Dentistry (IAPD) and the European Academy of Pediatric Dentistry (EAPD), the number of patients that required sedation approaches is slightly more important than in general practice without exceeding 10% of patients per day (Wilson et Alcaino). Currently, the use of sedation was rare as 89% of the participants had never used sedation. This can be related to the lack of formation about this field.

Only 12.3 % of practitioners received post-academic training in EMONO which is in good agreement with the results of previous studies (Fisher et al.; Brahm et al.; Leitch et Jauhar). However, most of the

respondents in the present survey (67.5 %) expressed their necessity for the postgraduate formation to update their knowledge about the new features of sedation.

In addition, it is interesting to note that the staff was not always trained about this topic, which can negatively affect the conduct of sedation session because they should monitor the patient's condition who is under sedation as the dentist is totally focused on the dental care that he performs (Rosenberg et American Dental Association).

It's known that conscious sedation provides amnesia, sedation and analgesia (Tobias et Leder). This approach is widely recommended in the management of patients with behavioural disorders, mental retardation, or intense anxiety for dental treatment (Prud'homme et al.). Its signs disappear when administration is ceased. Although, it's fundamental to inform patients, before any sedation conduct, about the procedure conditions. This includes verbal explanations and written recommendations which are mandatory. Currently, among 19 practitioners who use conscious sedation, only 4 do not make any recommendation.

Thus, 21% emphasised the importance of psychological preparation. Others, corresponding to 15.8% of the participants highlight the necessity of explaining to the child's guardians about the side effects of the approach, and the importance of patient's monitoring throughout the day, in fact some side effects may last for a few hours after the procedure, including headache, slow reflexes and drowsiness (Jewell).

Furthermore, 15.8% recommended slight meals on the intervention appointment and the absence of fever or cold. Avoiding to drink or to eat before sedation session, can avert risks of vomiting and nausea. Regarding oral sedation, the present results revealed that the main sedative drug commonly prescribed was Benzodiazepines representing 39% of the responses. Especially, the Diazepam (Valium) is commonly used by the pooled participants. Benzodiazepines are anxiolytic, sedative, and these medicines are indicated for the handling of mild to moderate anxiety. However, it has been recently recommended to avoid benzodiazepines e.g. Diazepam with long elimination half-time (20-80hours). This is because it can lead to exhaustion. In addition, Diazepam is likely associated with hepatic dysfunction because of its active metabolites released in the liver (Donaldson et al.).

For paediatric patients, H1-antihistamines present the favoured sedative drugs for the management of dental fear and anxiety particularly Hydroxyzine due to its more adorable taste compared to others sedatives (Peace). Concerning the question about the adequate dose, 64.9% of practitioners had the right answer. The specialists show the most pertinent management, the difference was statistically significant (p=0.005).

Concerning the timing of premedication intake, most of the involved practitioners preferred the association (27.2% of responses) or the single administration before the dental treatment (28.6% of responses). Based on the patient profile, the practitioner can select any of the mentioned methods or associate the two (Kanto). The setting of administration can lead to some difficulties, especially for the administration barely before the operation. In the present study, we found that approximately 20% of participants recommended that patients should take the premedicant at their home. In literature, the patient should conveniently come earlier to dental office in order to take the drug and stay at the waiting room while waiting the desired effect. Thereby, the medical staff can monitor the patient and manage the potential complications (Najjar).

Concerning the current survey, we cannot neglect some restrictions, e.g. the sample size which is restricted and it can not considered as representative of the targeted population. Furthermore, a national survey is required to determine the possibility of regional differences concerning the sedation approaches. This will certainly promote practitioners knowledge about this field. In addition, we can neglect the existence of participation and selection biases. Regarding the participation bias, the limited participants'number can be explained by their indifference about the present topic or because they do not treat pediatric patients. Concerning the selection bias, it can be related to the preponderant participation of young age group in this survey compared to the rest of age categories. This can be related to the online questionnaire's dissemination. This demonstrates that young practitioners are more interested in online information. Another restriction was the Covid-19 pandemic because it inhibited the questionnaire delivery. A live survey can give more spontaneous responses without prior documentation which is likely occurred on online dissemination. Therefore, the findings should be interpreted cautiously and further well designed studies are highly required to give more details about sedation use by general practitioners and to explore other sedative drugs and approaches not assessed currently.

Conclusion

It's interesting to note that our bibliographic research reveals few clinical studies assessing the knowledge and the practice of sedation among dentists in Tunisia, especially for the management of pediatric patients. Therefore, we aimed to conduct a survey determining the attitude of Tunisian private dental practitioners regarding sedation use for children management. This study revealed a poor mastery of the recommendations and a lack of knowledge on the part of dentists as the molecules prescribed are not always adapted.

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