Original Article

Assessment of Knowledge, Attitude and Practice Regarding Painless Technique for Pediatric Patients by Dental Practitioners

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ABSTRACT

Introduction: Dental practitioners have a challenging task when providing care to the young patients given the wide variability of factors that take place in dental settings. Furthermore, children become uncooperative and often more difficult to treat. One way to reduce management difficulties in children is to explore strategies for reducing the pain and discomfort associated with dental procedures. Numerous studies have been conducted to achieve a painless dental procedure for children, like use of WAND, chemomechanical method of caries removal, lasers, and ultrasonic methods. The aim of the present study was to assess the knowledge, attitude, and practice regarding above painless techniques for pediatric patients by dentists in India.

Methodology: A systematic random survey was conducted among dental practitioners across India. A questionnaire pertaining to individual details, approach towards painless pediatric dentistry, knowledge level and the training on painless techniques was framed on Qualtric software and the link was mailed to dentist through mail. Statistical analysis was done using IBM SPSS 20. The data were then statistically evaluated. Chi Square test, Pearson and Spearman Correlation test were applied.

Results: Total 1064 responses were obtained. In the present study the negative correlation (Pearson co-efficient -0.181) between knowledge of painless techniques and their usage in practice was found.

Conclusion: The dentists have the knowledge about the newer techniques in painless dentistry, but the usage is less because these are not cost effective.

Keywords: Painless dentistry, WAND, chemomechanical caries removal, lasers, ultrasonic.

INTRODUCTION

Dental treatment is usually a stressful event for children. The fear and anxiety in children during the dental visit not only affects the quality of the outcome of treatment but also the attitude of a child towards the dental profession.[1] Painful dental operations cause fear, whereas fear and anxiety increases the amount of perceived pain.[2,3] Wide variability of factors can affect the child's emotions of fear and anxiety in dental settings. Main triggers for their anxiety in dental set up are the sight of the anesthetic needle and sound, smell and vibration of dental hand piece and rotary dental drill, and pain associated with dental treatment.[4]

It has been suggested that reducing these stress-triggers is an effective procedure for managing anxious patients. Pain control is an important part of dentistry and particularly of pediatric dentistry.[3] It can be achieved by removing four of the key primary sensory triggers for dental anxiety-sight (air turbine drill, needles), sound (drilling), sensations (high frequency vibrations, the annoyance factor), and smell and it is used in combination with other measures to alleviate anxious behaviors.[4,5,6] In order to decrease the management difficulties in children, there is a need to explore strategies for reducing the pain and discomfort associated with invasive dental procedures.[7]

Numerous studies have been conducted to achieve a painless technique, like use of WAND, chemomechanical methods, lasers, and ultrasonic methods. WAND was manufactured in 1997 by Milestone Scientific Inc., NJ.[8] It maintains an ideal flow rate of anesthetic solution[9] and eliminates anxiety or fear related to needle prick while delivering anesthesia.

The investigators like Gibson et al[10], Allen et al[7], Palm et al[11], and Yesilyurt et al[12] concluded that the computerized injection device WAND, held considerable promise as a means of reducing the management difficulties with school-aged children.[8]

Due to the limitations of drill and local anaesthesia, there has been growing interest in developing other techniques, which are more comfortable and preserve healthy dental tissues.[13,14] Chemomechanical Caries Removal (CMCR) was introduced:

A. 1972 GK-101 solution

B. 1984, Caridex **(**National Patent Medical Products Inc., New Jersey, USA**).**

C. 1998, Carisolv (Mediteam)

D. 2003, Papacarie (Brazil)[8]

Chemomechanical agents selectively remove softened dentin and conserves the tooth structure and also eliminates the use of anesthesia[14] and airotor.

An ultrasonic (US) hand piece technique provides a precise and conservative tooth preparation with cutting tips coupled to high-frequency oscillates in the ultrasonic region; the tips perform an elliptical motion. It provides ideal access, visibility, and because of enhanced efficiency can also play a role in eliminating some of the patient discomfort of the dental treatment.[15,16] Also, avoids damage to the adjacent tooth and minimize the loss of tissue caused by cavity preparation. According to Walmsley et al[17] it is possible to use ultrasound without any local analgesia. A patient's pain is reduced as US system eliminates the production of noise, vibration, heat, and pressure according to study of Kontturi-Narhi et al.[18]

As carious dentin has more water content then the sound tissue, it vaporizes carious dentin. The reaction creates high localized pressure and a micro explosion, which results in removal of dental hard tissue.[19] Laser therapy is an alternative method for managing anxious patients as it reduces the effect of sight and sound of dental handpiece.[20]

The aim of the study was to assess the knowledge, attitude, and practice regarding painless technique used for pediatric patients by private practitioners in India.

METHODS

A cross sectional study was conducted among dental practitioners in India. A questionnaire pertaining to individual details, approach towards painless pediatric dentistry, knowledge level, and utilization of these painless techniques in their practice was prepared. The questionnaire composed of total 26 questions, which can be broadly divided into 2 parts as given in table 1.

A. Demographic data

B. Knowledge, attitude, and practice of new technique.

This was based on 5 point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

To obtain response from cities all over the country, the online questionnaire form was generated at Qualtrics software and link was mailed to the dentists. A total of 1067 responses were obtained.

Statistical analysis was done using IBM SPSS 20. The data was collected from the Qualtrics software in tabulated form. These data were then statistically evaluated. Chi Square Test and Pearson and Spearman Correlation test were applied. This was done to find the relationship between knowledge of practitioners about new painless techniques and their utilization in their practice.

RESULTS

A total of 1098 questionnaires were distributed across India, with 3% dropout rate, total 1067 responses were obtained. The Qualtrics software gave the IP address of the participants in study, major practitioners were from Delhi, Jaipur, Mumbai, Pune, Jhansi, Ahmedabad, Udaipur, Bhopal, Indore, Raipur, Nagpur, Kolkata, Hyderabad, Bangalore, and Kochi.

In the present study of 1067 practitioners, 74% were female and 26% were male practitioners. Age distribution for 25-35 years was 96%, for 36-45 years was 4%, for 46-55 years was 2%, and for 56-65 above was 2%. 66% of the practitioners were BDS, 23% were MDS, 5% were MDS in

Table 1: Questionnaire

1. Age:
2. Sex:
3. Years in practice:
   A. 0-5 B. 5-10 C. 11-15 D. >15 Years
4. Education:
   A. BDS B. MDS (Specialty mention) C. Other
5. How do you keep yourself updated about dentistry?
   A. Scientific publication literature B. CDE and Conferences
   C. Internet D. Others-specify

Do you know about? (tick yes or no)

	Techniques	Yes	No
6.	WAND		
7.	Chemomechanical methods of cavity preparation		
8.	Lasers		
9.	Ultrasonic methods		

Do you use following techniques in your routine practice

	Techniques	Yes	No
10.	WAND		
11.	Chemomechanical methods of cavity preparation		
12.	Lasers		
13.	Ultrasonic methods		

	Response	1	2	3	4	5
14.	Computerized Anesthesia (WAND) provides increased tactile sense and ergonomics.					
15.	Children may become restless with the lengthy injection duration required by the WAND.					
16.	Chemomechanical system of caries removal utilizes hand instruments that result in operator fatigue.					
17.	Chemomechanical system of caries removal does not require burs, so annoying sounds are not produced to affect the behavior of child.					
18.	It is mandatory to prepare the patient and operator with protective gears before using LASERS.					
19.	LASERS give bloodless operative field.					
20.	Ultrasonic cavity preparation does not increases intrapulpal temperature when compared to rotary.					
21.	The ultrasonic cutting tips used for cavity preparation are different from scaling tips.					

Do you think that the following techniques have benefit over conventional methods and can help dentist to deliver oral health services painlessly and efficiently to child?

	Response	1	2	3	4	5
22.	Computerized Anesthesia (WAND)					
23.	Chemomechanical system of caries removal					
24.	Lasers					
25.	Ultrasonic Systems					

26. What is the possible cause of not using the above mentioned technique in daily practice?
   A. They require special training to use them B. Initial cost of set up is more
   C. Technique sensitive D. Other - mention

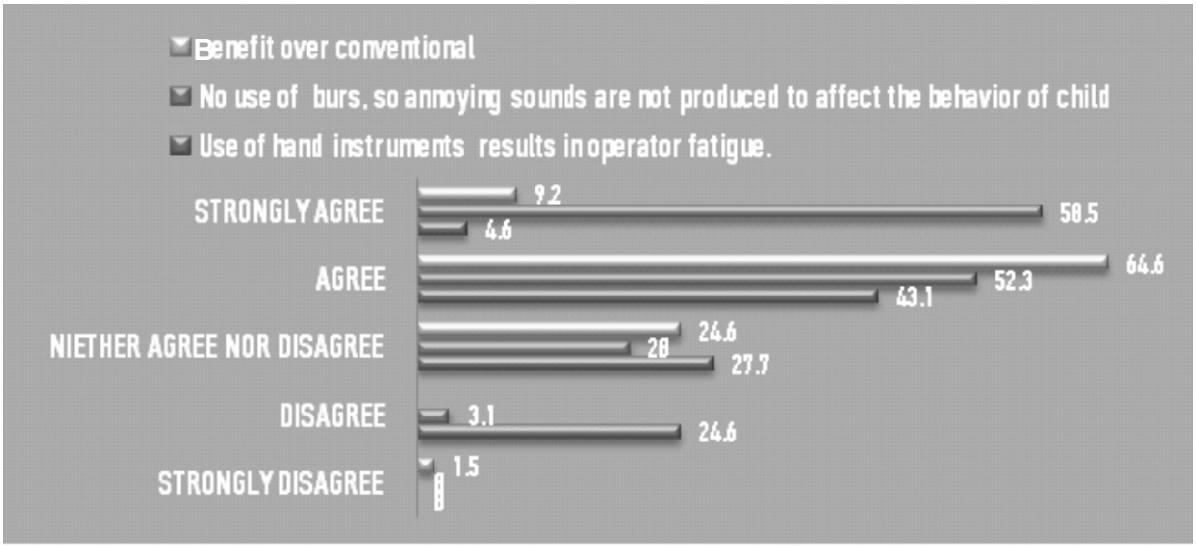

Figure 1: Response scale for Chemomechanical method of cavity preparation.

Pedodontics, and 6% were others (certificate course). 66.2% were practicing for 5 years, 23.10% for 6-10 years, 4.6% for 11- 15 years and 6.2% for >15 years.

The present study shows that 86% of the practitioners had updated their knowledge about new techniques in CDE and conferences, 36% by internet and 10% by scientific publications. In the present study, 56.9% of practitioner agree that WAND has benefits over the conventional local anesthetic administered technique. 44.6% agree it provides increased tactile sense and ergonomics. In present study, 64.6% of practitioners agree that CMCR has benefits over conventional method of cavity preparation. 58.5% of practitioners strongly agree that CMCR don't involve use of burs, so annoying sounds are not produced to affect the behavior of child. 43.1% also agrees that use of hand instruments for CMCP results in operator fatigue (Figure 1).

In the present study, 58.5% of practitioners agree that Lasers have benefit over the conventional methods and also provide bloodless operative field. 44.6% strongly agree and 49.2% agree that it is mandatory to use protective gears for Lasers (Figure 2).

In the present study, 58.5% practitioners agree that US have benefit over conventional method of cavity preparation and 58.5% strongly agree that the tips used for ultrasonic cavity preparation is different from ultrasonic scaling tips. 33.8%

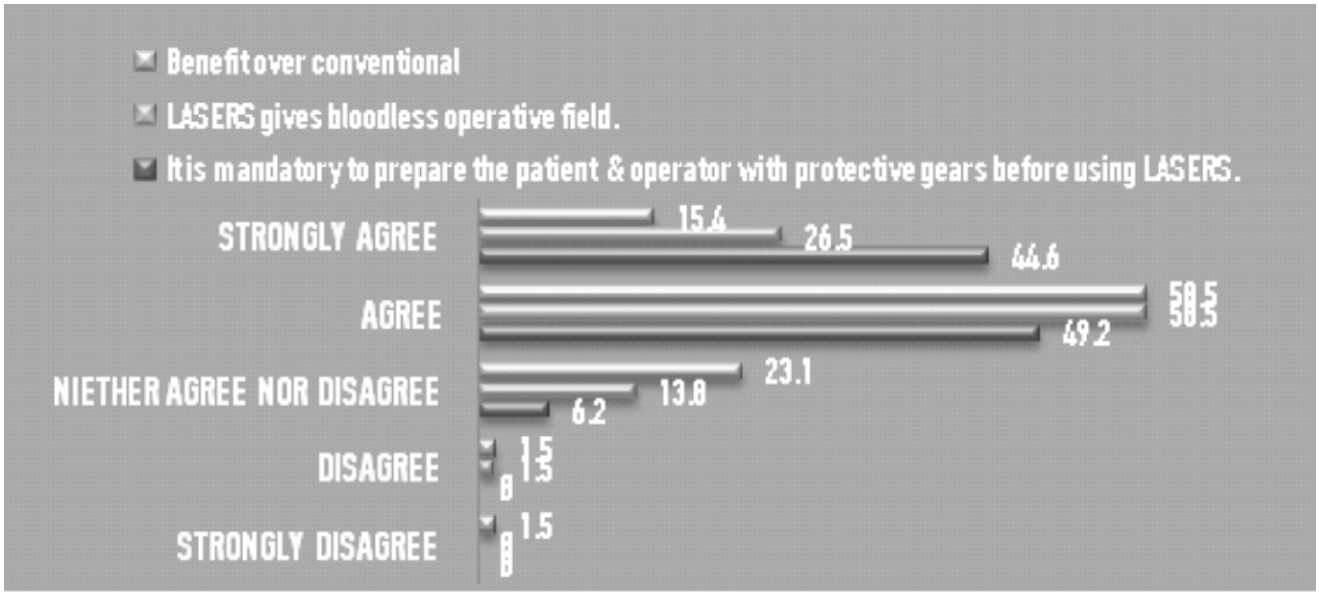

Figure 2: Likert scale for Lasers.

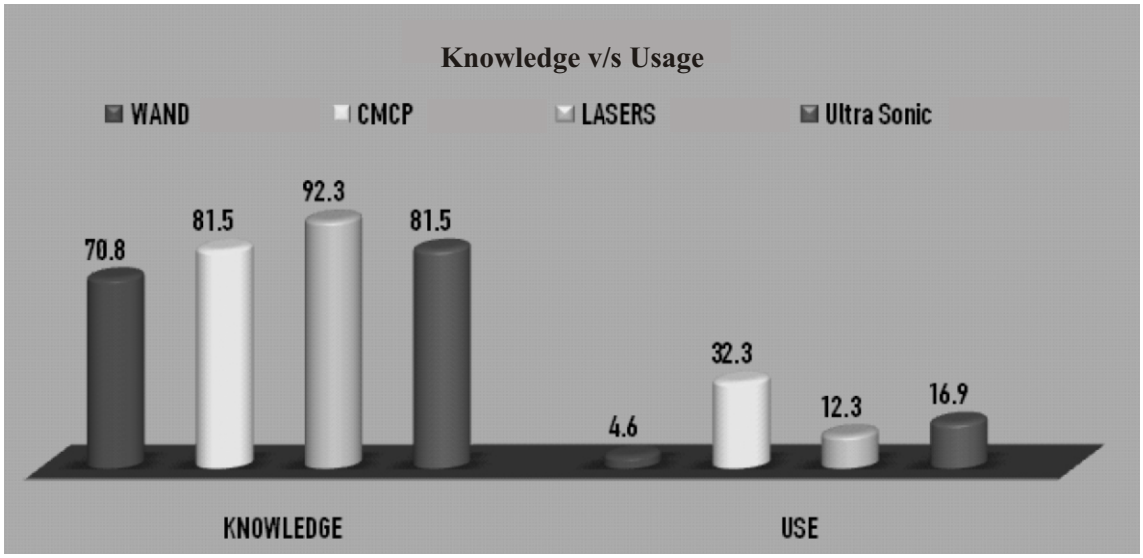

Figure 3: Result of knowledge of techniques verses its usage in practice.

practitioners agree that US cavity preparation does not increase the intra pulpal temperature during cavity preparation.

The present study shows the knowledge of practitioner about painless techniques and their usage in practice. There is negative correlation (Pearson co-efficient was -0.181) between knowledge and use (Figure 3).

When the reason was asked for the possible cause of not using the above mentioned technique in daily practice: 76% believed that initial cost of set up is more. 29% are of the opinion that special training is required to use them while 15% agreed that these are sensitive technique. 1% gave other reasons like unavailability in regions where they practice.

DISCUSSION

New technologies are an alternative method to provide dentists the new possibilities to change completely the restorative treatments[4] and give painless treatment to patients.

In the present study, 86% of dentists attend CDE and conferences to update themselves for new advancement in dentistry. Dentists attend conferences to update knowledge, to learn advance research, train, educate and set evidence-based policy.[21]

In the present study, 56.9 % of dentists believe that WAND has benefit over conventional syringe for LA administration; this is in accordance to Yenisey[22] as this give better tactile sensation. Gibson et al[10] reported that 41.5% believe that child become restless because it is a lengthy procedure. WAND require significantly more time than conventional technique and moreover child may show the disruptive behavior. Gibson also stated that on average WAND require 3.73 minutes compared to 2.1 minutes for conventional method.

In the present study 64.6 % of dentists believe that CMCR is better that conventional cavity preparation for children. This is in accordance with a study which reported that CMCR is a better approach for children.[23] While 43.1% of dentists believe that use of hand instruments can lead to hand fatigue, this is in accordance to Abraham et al[13] evidence based study.

In the present study, 44.6% strongly agree and 49.2% of dentist agree about use of protective measures before using lasers, this is in contradiction to findings of Yadav et al[24] in a survey about lasers in India, where majority of respondents were not aware of the safety measures.

Only 33.8% of dentist knew that there is a minimum temperature rise in pulp with ultrasonic cavity preparation. According to Vasconce et al[15], ultrasound is safe, since increase in pulpal temperature is lower than the critical value of 5.5°C, thus there is no risk of pulpal damage.

In the present study, it was found that knowledge of dentists about painless techniques is optimum but their usage in practice is very less as compared to that. There is negative correlation (Pearson co-efficient -0.181) between

knowledge and its use. In the present study, 32.3% dentists use CMCR methods and only 12.3% use lasers. This is in accordance to Bhat.[23] CMCR products are easily available in Indian market. Similar findings have been reported that chemomechanical caries removal seems to be more feasible than lasers or US method.[13] On the other hand less use of lasers might be because of the large unit with a very sensitive delivery system, it require special training, and is not cost effective.[13] WAND usage was least in only 4.5% and may be due to high price of equipment, this is in accordance with Ananthi et al[25] that limited use of WAND is due to its cost.

CONCLUSION

Pain has an impact on the behavior of child and their negative behavior impose difficulties for dentists in management and providing effective treatments. Inadequate knowledge and training for new techniques among dental professionals and the cost of the equipment has restricted their use. The Indian dentists have knowledge about these new techniques to provide painless treatment for children but the usage is very less because according to them these methods are not cost effective.

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