

Childrenese–Child-Friendly Language for Dental Drill in Pediatric Dental Practice - A Questionnaire Survey

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ABSTRACT: In Pediatric Dentistry, Several researchers have emphasized the importance of the development of child-friendly communication with pediatric dental patients. The term “Euphemism” is the mild expressions that substitute words which may be fearful or suggest unpleasantness are often used to create a positive rapport and make the dental procedure more acceptable to a dental patient. The terminology and the sound of dental drill induces children’s anxiety and annoyance increase. Although there are studies which give word substitutes or phrases (euphemisms) that are used to describe dental office procedures and instruments, the real challenge is to find the child friendly language for dental drill which can make the dental procedure more acceptable to the child. The study first of its kind was undertaken to identify the terminology/substitute word used for dental drill and preferred sound for masking the noise of dental drill by the pediatric dental practitioners by conducting questionnaire survey. A questionnaire survey was conducted among pediatric dentist in India to determine which word and sound can be substituted for dental drill for pediatric dentist use to alleviate the child’s anxiety regarding dental drill and in establishing healthy relationships with their child patients. Out of 651 pediatric dentists 427 responded to a mailed survey. The survey consisted of 10 questions. The results suggested that the preferred Child-Friendly language for dental drill are Dragon fly, tooth cleaner (substitution word) and Dragon fly sound (substitution sound) and this sound can be used as a sound masker for dental drill sound in near future to reduce the children’s anxiety and annoyance.

Keywords: Dental drill, Dental anxiety, Substitution word, Sound masking, Child-friendly.

INTRODUCTION

In Pediatric dentistry, despite the tremendous advancement made in modern dentistry, dental anxiety is regarded as a serious worldwide health issue. They are anxious of the threatening words and situations, that they believe they cannot cope up with it therefore avoid them (Kazemi and Kohandel 2015). The various aspects of the dental setting have the potential to evoke dental anxiety responses. The negative influences of dental anxiety on daily oral health raises questions regarding the anxiety provoking dental environment. In the last few years, numerous studies have been conducted to identify the potential anxiety-provoking

stimuli present in the dental setting. These anxious stimuli include experiencing an injection (Corah *et al.*, 1985; Scott *et al.*, 1984), having dental X-rays taken (Doebeling and Rowe 2000), the sight of the needle (Gale 1972), various aspects of the drill such as its appearance, sound, and feeling (De Jongh *et al.*, 2003), improper behavior on the part of the dentist (Abrahamsson *et al.*, 2002), pain sensations (Mellor 1992), and several other potentially fear-evoking aspects of the dental practice environment including its smell, dental personnel, and the chair (Domoto *et al.*, 1988). Although numerous studies have scrutinized possible anxiety-provoking dental stimuli, only few studies have concentrated on the anxiety-provoking

impact of dental equipment, including the high speed air-turbine (dental drill) and the ultrasonic dental scaler. The dental high-speed air turbine (drill) is considered to be essential equipment for dental treatment. However, the name and sound of a dental drill seems to make pediatric dental patients fearful (Tomami *et al.*, 2006).

In order to perform a satisfactory and optimistic dental care for the pediatric dental patients, the dentist must alleviate the anxiety regarding the dental drill to have their full cooperation and establish positive and non-threatening relationships. Communication is the key to establish the rapport with the child patients (Chamber 1976). The hallmark of a successful pediatric dentist is his ability to communicate with them and win their confidence. The effective communication lies in the use of non-anxious, child friendly vocabulary to describe and mimic the dental equipment especially the dental drill during the procedure.

Wong *et al.* (2011) conducted a four-part questionnaire survey to assess the effects of the sound of dental equipment on people's perceptions and dental anxiety levels and the results showed that the sound of dental equipment has a great influence on dental anxiety. Yamada *et al.* (2021) suggested that reducing the sound pressure level and refining the frequency characteristics of sounds emitted by a dental drill by considering acoustical characteristics are essential for developing new noise control measures to create a comfortable sound environment in dental clinics.

The long period dental drill noise exposure may lead to annoyance of the child patient and the dentist (Alayrac *et al.*, 2011; Pierreette *et al.*, 2012), increase the anxiety of the child and reduce task performance (Kaarlela *et al.*, 2009) of the dentist (Zare *et al.*, 2016; Fouladi *et al.*, 2012; Basner *et al.*, 2014). Recently, to reduce the industrial noise impact, different noise control technologies were developed and applied. The sound masking is such a promising method. Masking effects can be described as the threshold decreasing of a sound when another sound is present. Masking has already been applied successfully in speech enhancement (Virag, 1999) and information privacy (Fujiwara *et al.*, 2009; Keraenen *et al.*, 2009; Hioka *et al.*, 2016). However, the purpose of identifying a perfect substitution sound for dental drill and sound masking in pediatric dentistry is not only to target non-anxious sound friendly environment but also to reduce the annoyance of the child and the dentist to provide a quality dental treatment (Lavandier and Defreville 2006).

The study first of its kind was undertaken to identify the terminology\ substitute word used for dental drill and preferred sound for masking the noise of dental drill by the pediatric dental practitioners by conducting questionnaire survey.

MATERIALS AND METHODS

This was a questionnaire survey conducted among pediatric dentist in India. It was conducted to determine

which word and sound can be substituted for dental drill for pediatric dentist use to reduce the child's anxiety regarding dental drill and in establishing healthy relationships with their child patients. Out of 651 pediatric dentists 427 responded to a mailed survey.

This study and the questionnaire were approved by the Institutional Ethics Committees of JKK Nataraja Dental College & Hospital.

The survey was developed and reviewed by the authors. A pilot study was conducted to validate the questionnaire with a focus group involving 15 pediatric dentist who were not included in the final survey. Following the retrieval of the email addresses, an email explaining the purpose of the study and a link to Survey Monkey electronic survey was sent to all the members. The survey ensured confidentiality as no personal information on the participants' identity was required to be disclosed and was strictly voluntary as mentioned in the recruitment statement of the participant for the survey. The survey consisted of 10 questions, four regarding socio-demographic and practice characteristics; There are six questions regarding whether they found difficulty in using the drill for pediatric dental patients, to assess what makes the child patients anxious about the dental drill, whether there is a need for the substitute word for dental drill, if needed what are the frequently used substitution words for the dental drill, whether there is a need to mask/substitute sound for dental drill and if needed what are the non-anxious sound that can be substituted for dental drill.

The responses to the questions varied in format. Some questions consisted of dichotomous responses (i.e. Yes/No) and some questions allowed multiple responses. Non-respondents were reminded to participate in the survey a second time after one week. The responses of the participants were entered electronically into the SPSS for Windows version 20 (SPSS Inc., Chicago, IL, USA). The data obtained was analyzed using descriptive statistics and Chi square test. The level of significance was set at $p < 0.05$.

RESULTS

The distribution of the entire questionnaire based on the frequency and percentage is shown in Table 1. Almost 53% of the respondents found difficulty often in using the dental drill in pediatric dental patients. In particular, the sound of a dental drill was chosen with the highest percentage of 56% that cause fear among pediatric dental patients when compared to feeling drill (25.3%) and seeing drill (18.7%). 92.3% of the respondents need the substitution of words for the dental drill. In particular, the respondents who answered dragon fly (37%) and tooth cleaner (34.4%) as a frequently used substitution word for dental drill are almost equal followed by tooth washer (11.2%), bug chaser (5.9%), whistling willie (4.4%), buzzer (3.5%) and others (3.5%). 98.8% of the respondents need the substitution\ masking of dental drill sound. Among the

non-anxious sound that can be substituted for the drill sound, 67.2% of respondent opted for dragonfly “Hiss” sound followed by whistle sound (20.4%) and buzzer sound (11.9%).

The comparison of the response of Question 1 with Question 3 & 5 are shown in Table 1. Among 228 respondents who often found difficulty in using the dental drill in child patients, 202 need the substitution of words for the dental drill and 228 need substitution masking of dental drill sound.

The comparison of the response of Question 1 with Question 2, 4 & 6 are shown in Table 2. Among 228 respondents who often found difficulty in using the dental drill in child patients, 124 had chosen hearing drill causes fear among pediatric dental patients, 101 had chosen Tooth cleaner as a frequently used substitution word for dental drill and 174 had chosen Dragon fly Hiss sound as the substitution sound for dental drill. Among 193 respondents who sometimes found difficulty in using the dental drill in child patients, 104 had chosen Dragonfly as a frequently used substitution word for dental drill.

DISCUSSION

In Pediatric dentistry, fear and anxiety often prevent the pediatric dental patients from visiting the dental clinics for preventive and therapeutic treatments (McGrath and Bedi 2004; Quteish 2002; Sohan and Ismail 2005; Klages *et al.*, 2004). The name and sound of the high speed dental turbine (dental drill) are considered to be the highest anxiety provoking stimuli in the pediatric dental setting.

According to Finn and Sidney (1973) inappropriate use of vocabulary by the dentist often elicits emotion-laden responses. Kozlov *et al.* (1964) suggested that dentists to avoid fear provoking words since many suggestive fears are not of the procedure itself, but rather of the fear producing connotation of a word. He also cautions that when working with pediatric dental patients it is mandatory to avoid deceptors and whenever possible descriptive words without the connotation of pain should be used. These euphemisms (mild expressions that substitute for words which may be offensive or suggest unpleasantness) often make the dental procedure more acceptable to a patient and ease the tension of both the dentist and the patient. Their use in dental practice should be dictated by the age of the patient, and by the ability of the dental team to use this vocabulary in a natural spontaneous manner (Lenchner and Wright 1975). Ginott and Haim (1969) called this language “childrenese” and Kreinces (1975) suggested that to be “the second language of the Pediatric Dentist”.

In our study among the six substitution words used for dental drill, dragon fly and tooth cleaner were considered to be highly preferred substitution words for dental drill. The vocabulary of communicating with the child dental patient is endless and limited only by the imagination of the dental health team.

Most of the respondents found difficulty often in using the dental drill in pediatric dental patients. In the present study, the sound of a dental drill was chosen to cause fear among pediatric dental patients when compared to feeling drill and seeing drill. This suggested that uneasiness is intensified when patient hear the sound of the dental drill even before the actual drilling treatment. This also suggested that the sound of a dental drill created a psychological effect on dental patients and it would be important to improve the sound. Most of the respondents need the substitution sound for masking of dental drill sound. Among the non-anxious sound that can be substituted for the drill sound, dragonfly “Hiss” sound was opted followed by whistle sound and buzzer sound.

Recently, noise control have been employed, including the passive and active noise control techniques or a combination of them to help the children address their fear and encourage them to seek proper oral healthcare treatment. Conventional methods for noise control include the application of mufflers, proper maintenance of hand pieces, and keeping compressors away from the work place (Kumar *et al.*, 2011). Noise disturbance can also be reduced by using sound-damping materials in the dental offices and laboratories (Wagner, 1985). These passive noise control methods are quite efficient at higher frequencies; however, the performance is significantly degraded for low-medium frequency noises, where the dental equipment usually produces large and annoying noises (Arindam *et al.*, 2013).

Moreover, passive methods usually prevent an efficient communication between patients and dental professionals. In our present study, Dragon fly Hiss sound followed by whistle sound and buzzer sound are considered as a substitution sound for dental drill and these sounds can be incorporated in Active Noise Control system in near future that can reduce patient’s discomfort and protect them from anxiety while allowing good patient-dentist communication.

Recently in industrial environment, the technique of sound masking is considered to be better method and masking effects can be described as the threshold decreasing of a sound when another sound is present. Sound masking has already been applied successfully in speech enhancement (Virag, 1999) and information privacy (Fujiwara *et al.*, 2009; Keraenen *et al.*, 2009; Hioka *et al.*, 2016).

Due to water features are well-acknowledged as an important element of the environment, water sounds commonly are used as masker to help boost human emotions and improve cognitive abilities (Coensel *et al.*, 2011). The water sounds generated by small to medium sized water features were adopted to mask the road traffic noise (Galbrun and Ali 2013). Further they found that highly pleasant water sound added to the road-traffic noise may increase the overall pleasantness (Radsten-Ekman *et al.*, 2013). The electric welding noise as the typical industrial noise was masked separately by rain, waterfall and fountain sound.

According to the results, the masking effects of water sounds to the welding noise were obvious. The fountain sound obtained the better masking effect than the others. Although the sound masking has been proved to have a great impact on the environmental noise and industrial noise, but not much research have been carried out to mask the dental drill noise. In our present study, Dragon fly Hiss sound is considered as a substitution sound for dental drill. Further studies proved that water sounds were the best sounds for

enhancing the sounds cape perception and the study showed that the water sounds should be similar or not less than 3 db below the noise level (Jeon *et al.*, 2010). Based on the above study, the dragon fly Hiss sound can be used as a sound masker for dental drill sound in near future because it is similar to the dental drill sound (Dental drill- 90-100db, Dragon fly sound – 90db) when compared to whistle (104-116db) and buzzer sound (80- 95db).

Table1: Distribution of all questions based Frequency and percentage.

Sr. No.	Question	Response	Frequency	Percent
1.	Q1. Found difficulty in using dental drill for pediatric dental patients	Not at all	5	1.2
		Sometimes	193	45.2
		Often	228	53.4
		Always	1	0.2
2.	Q2. What makes a Pediatric dental patient fearful regarding the dental drill?	Seeing drill	80	18.7
		Hearing drill	239	56
		Feeling drill	108	25.3
3.	Q3. Substitution of words for dental drill is needed for Pediatric dental practice.	Yes	394	92.3
		No	33	7.8
4.	Q4. Frequently used substitution word for dental drill	Tooth cleaner	147	34.4
		Tooth washer	48	11.2
		Dragon fly	158	37
		Whistling willie	19	4.4
		Bug chaser	25	5.9
		Buzzer	15	3.5
		other	15	3.5
5.	Q5. Do we need substitution/masking of dental drill sound in pediatric practice?	Yes	422	98.8
		No	5	1.2
6.	Q6. Non anxious sound that can be substituted for drill sound.	Dragon fly's hiss sound	287	67.2
		whistle sound	87	20.4
		Buzzer sound	51	11.9
		others	2	0.5

Table 2: Comparison between Q1 (Found difficulty in using dental drill for pediatric dental patients) and Q2 (What makes a Pediatric dental patient fearful regarding the dental drill?), Q4 (Frequently used substitution word for dental drill) and Q6 (Non anxious sound that can be substituted for drill sound) using chi square test.

	Q2. What makes a Pediatric dental patient fearful regarding the dental drill?	Seeing drill	Hearing drill	Feeling Drill	Total				Chi square value	p value
Q1. Found difficulty in using dental drill for pediatric dental patients	Not at all	2	2	1	5				32.09	0.001**
	Sometimes	16	112	65	193					
	Often	62	124	42	228					
	Always	0	1	0	1					
	Q4. Frequently used substitution word for dental drill	Tooth cleaner	Tooth washer	Dragon Fly	Whistling willie	Bug chaser	Buzzer	other	Chi square value	p value
Q1. Found difficulty in using dental drill for pediatric dental patients	Not at all	0	1	3	0	1	0	0	55.07	0.001**
	Sometimes	45	23	104	6	8	7	0		
	Often	101	24	51	13	16	8	15		
	Always	1	0	0	0	0	0	0		
	Q6. Non anxious sound that can be substituted for drill sound.	Dragon fly's hiss sound	whistle sound	Buzzer sound	others	Total			Chi square value	p value
Q1. Found difficulty in using dental drill for pediatric dental patients	Not at all	2	1	2	0	5			42.7	0.001**
	Sometimes	110	69	13	1	193				
	Often	174	17	36	1	228				
	Always	1	0	0	0	1				

Table 3: Comparison between Q1 (Found difficulty in using dental drill for pediatric dental patients) and Q3 (Substitution of words for dental drill is needed for Pediatric dental practice), Q5 (Do we need substitution/masking of dental drill sound in pediatric practice?) using chi square test.

	Q3. Substitution of words for dental drill is needed for Pediatric dental practice.	Yes	No	Total	Chi square value	p value
Q1. Found difficulty in using dental drill for pediatric dental patients	Not at all	0	3	3	64.54	0.001**
	Sometimes	191	2	193		
	Often	202	26	228		
	Always	1	0	1		
	Q5. Do we need substitution/masking of dental drill sound in pediatric practice?	Yes	No	Total	Chi square value	p value
Q1. Found difficulty in using dental drill for pediatric dental patients	Not at all	0	5	5	58.46	0.001**
	Sometimes	193	0	193		
	Often	228	0	228		
	Always	1	0	1		

CONCLUSIONS

Although various behavior management strategies have been used in Pediatric dentistry, effective communication with child patients has evolved over the years and complex vocabularies have been developed. The present study attempted to present the need of current state-of-the-art of euphemistic language for dental drill in pediatric dental practice. It is widely recognized that proper communication with the child patient forms an integral part of present day pediatric dental care. Even though there is a wide diversity in the terminology utilized by the responding pediatric dentist to describe dental drill, the results of this study have demonstrated that the terminology that is currently encountered in pediatric dentistry as substitution word for dental drill are Dragon fly and tooth cleaner. By being aware of the terminology that is currently encountered in pediatric dentistry, practicing dentists will be able to compare and contrast the terminology that they use in their dental practice. Perhaps, dentists who find it difficult to establish positive relationships with child patients will now have a more complete repertoire of terminology which may aid them in achieving better cooperation while using the dental drill.

In our present study, Dragon fly Hiss sound is considered as a substitution sound for dental drill and this sound can be used as a sound masker for dental drill sound.

FUTURE SCOPE

The promising results identified in this study will facilitate in future that sound masking can be incorporated in coping strategy that can effectively reduce the fear and annoyance of the pediatric dental patients without carrying out any additional behavior management strategy during treatment.

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