



## Assessment Of Knowledge, Attitude & Practice Of Parents In Radiation Exposure of Children : A cross – Sectional Study

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### Abstract

**Background:** Dental radiography is considered as best diagnostic tool for diagnosing disease & act as an aid for proper treatment planning. In Pediatric dentistry, dental radiography has become part & parcel due to its uniqueness & ease of use. But at the same time there will be concern regarding the radiation safety especially for parents of the same Pediatric patients. Hence this study was conducted in order to assess the knowledge, attitude & practice of parents regarding the safety of Pediatric patients.

**Aim:** To assess the knowledge, attitude & practice of parents towards Pediatric dental radiography.

**Materials & Methodology :** In total 50 questionnaires were given to parents who visited the department for various treatment & random sampling technique was adopted. Questionnaires contained total of 16 questions which were based on Knowledge, Attitude & Practice towards pediatric dental radiography.

Questions were translated into both Hindi & English languages . The data was collected & tabulated & statistically analysed chi square test.

**Results :** Out of 50 parents of children who got their dental treatment done, 30 were boys & 20 were girls. From the survey, it is known that majority of parents i.e. around 88% are aware of dental x-rays & its benefits. Around 42 parents were curious enough & by enquiring regarding x-rays, fairly 84% of parents came to know that the dental x-rays were helpful for the treatment and also for future references, but unfortunately only 70% among them only had the knowledge of side effects caused by dental x-rays. It was also unfortunate to know that only 8% of parents were knowing regarding the digital x-rays while rest 84% had knowledge that x-rays can be taken only with the help of films.

**Conclusion :** It is appreciable to know that in present study, more than half of population are aware of dental health & various treatments i.e. dental radiology and its uses and demerits. This indicates a positive attitude of parents towards the dental treatment. The result of present study shows that parents were having sufficient knowledge regarding dental radiographs, x-rays etc, but they were unconcerned regarding the damaging effects that can cause on prolonged exposure of dental radiographs. Unfortunately, parents also had less knowledge regarding safety measures for the same.

**Keywords:** Radiograph, Pediatric dentistry, knowledge, awareness, parents

### Introduction

Dental radiography, commonly known as dental x-rays, has become the most frequent radiological investigations in the industrialized world<sup>1</sup>. Dental radiographs helps in diagnosis of disease, viewing the current scenario of hard & soft tissues, presence of any infections and its extensions, for future treatments plans etc. In children, dental radiography helps to evaluate the dental caries, dental injury, assessing tooth development & eruption. It helps to determine whether there is enough space for both primary & permanent teeth and assists in better treatment planning<sup>2</sup>.

X-rays are type of electromagnetic radiation, which are available as ionizing & non- ionizing radiation. Ionizing radiations like X-rays, have high energy capacity that can penetrate living tissues and hence are much of valuable use in medical & dental fields for diagnosis, therapeutic purposes. Though it has high valuable properties, ionizing radiation appears to be more harmful effects towards human body cells especially damaging the DNA of cells.<sup>3</sup>

Though radiation exposure in dental setting has to frequently repeated for several therapeutic procedures like pulpectomy, extractions, space maintainers etc, it remains one of the most relatively low radiations compared to other fields. The parents who visit for the treatment of their children, appears to have pessimistic view and are terrified of their children being affected of any type of carcinogenicity or mutagenicity<sup>4</sup>

Considering above mentioned factor, the present study was conducted to asses the knowledge, attitude & practice of parents in evaluating the awareness of harmful effects of radiations from radiograph. This study also helps to evaluate the knowledge regarding harmful effects of dental radiography, that helps in positive aspect of treatment planning.

**Materials And Method**

In total, 50 questionnaires that consists of 16 questions were given to parents who visited for the treatment of Pediatric & preventive dentistry of Rishiraj College of Dental Science & Research Centre. A written consent was taken from each parent before included the study. In total of 16 questions were taken, which was based on knowledge, attitude & practice. The first 7 questions was based on evaluation on knowledge of parents towards dental radiography and the next 9 questions was based on attitude & practice of parents towards dental radiology.

Questionnaires was translated into both English & Hindi languages.

**Results**

Of 50 parents of children who got their dental treatment evaluated, 30 were boys & 20 were girls. 7 variables elicited knowledge regarding pediatric radiology. A great majority (88%)were aware regarding dental x-rays, while only 4% did not know. 84% of parents reported first time exposure to X rays. 52% opinioned dentists takes radiographs while doing treatment, 26% felt because of decay and 22% because of pain. Parents felt mobile radiation was greater than dental radiograph films (58 % versus 6.0%) as seen in Table 1. No gender based difference was seen in any of the awareness related variable. Graph 1 depicts practice variables regarding pediatric dental radiography. Six questions were evaluated in this segment, with answers presented in the form of percentages in the bar graph.

Data was analysed on statistical package for social sciences (SPSS version 23; Chicago Inc, IL, USA). Chi square statistic was applied to find differences between awareness or knowledge relating to pediatric dental radiographs among patients.

**Table 1: Knowledge regarding parents towards paediatric radiology**

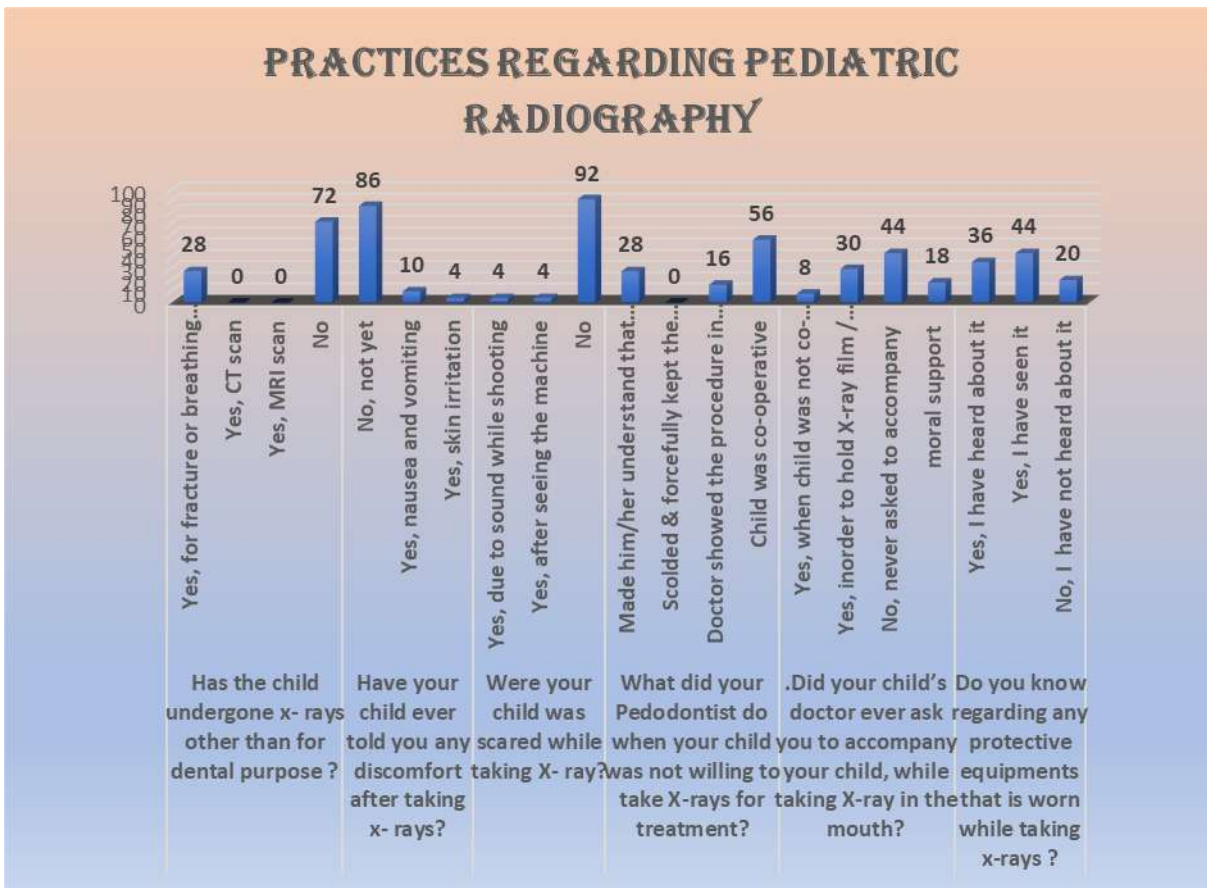
Variables	Males n (%)	Females n (%)	Total n (%)		
<b>Have you asked the dentist whether dental x-rays helps for treatment?</b>					

Yes, dentist explained how it helps	26 (86.7)	16 (80.0)	42 (84.0)		
No, never thought of asking about it	4 (13.3)	4 (20.0)	8 (16.0)		
<b>For what all purpose do you think dentist takes x-ray ?</b>					
Tooth decay	9 (30.0)	4 (20.0)	13 (26.0)		
Pain	7 (23.3)	4 (20.0)	11 (22.0)		
While doing treatment	14 (46.7)	12 (60.0)	26 (52.0)		
No idea	0 (0.0)	0 (0.0)	0 (0.0)		
<b>What all types of side effects have you heard regarding x-rays?</b>					
Nausea & vomiting	28 (93.3)	15 (75.0)	43 (86.0)		
Skin irritation	0 (0.0)	2 (10.0)	2 (4.0)		
Headache	0 (0.0)	0 (0.0)	0 (0.0)		
Eye problem	0 (0.0)	0 (0.0)	0 (0.0)		
Reduced salivary flow	0 (0.0)	0 (0.0)	0 (0.0)		
Cancer	0 (0.0)	0 (0.0)	0 (0.0)		
No idea	2 (6.7)	3 (15.0)	5 (10.0)		
<b>Which all types of x-ray have you seen using for your child ?</b>					
Film	24 (80.00)	18 (90.0)	42 (84.0)		
A wire attached to computer	6 (20.0)	2 (10.0)	8 (16.0)		
A machine rotating around the head	0 (0.0)	0 (0.0)	0 (0.0)		
<b>Radiation among which of the following causes more harm ?</b>					

Dental x-rays	3 (10.0)	0 (0.0)	3 (6.0)
Medical x-rays	9 (30.0)	4 (20.0)	13 (26.0)
Mobile	15 (50.0)	14 (70.0)	29 (58.0)
no idea	3(10.0)	2 (10.0)	5 (10.0)
<b>Total</b>	<b>30 (60.0)</b>	<b>20 (40.0)</b>	<b>50 (100.0)</b>

\*=Significant; NS=Not Significant

**Graph 1: Attitude regarding parents towards paediatric radiology**



**Discussion**

Dental radiography have become an indispensable aid in Pediatric dentistry. It has helped for better diagnosis, management of injury & for treatment planning. Though application of radiography has increased, its exposure risk for both patients as well as for operator’s has increased day by day.<sup>5</sup>

From 1970s, ALARA ( As Low As Reasonably Acheivable ) has provided with certain principles, in order to achieve a balance between benefits & potential risks. Currently ALADA is in use , which

refers to ‘As Low As Diagnostically Acceptable. This is also adopted by American Association for Pediatric Dentistry (AAPD) for the safety purposes of the children.<sup>1</sup>

More the experience, more positive attitude the individual develops & this can be seen similar to the study conducted by Fishbein & Ajzen in 1975, in which they had mentioned that, more positive a person’s experience is, more positive beliefs he/ she can hold & more positive attitude will be formed. From the study, it was found that, around 70% of

parents are aware of dental X-rays and was having positive attitude towards dental radiographs. This indicates, that parents who are aware of dental radiology & whose children had undergone X-rays, have the perception that radiographs are helpful & useful.<sup>7</sup>

Various radiological practices help in minimizing or even eliminating the unwanted exposures of dental imaging, which includes digital x-rays such as use of RVGs, F- speed films, use of protective gear etc. This is seen in a study conducted by Berkhout et al, 2002, in digital systems appears to be more user friendly and transition to faster film types are always accompanied by reduction of exposure time.<sup>8</sup>

Around 90% of parents had less knowledge on radiation exposure, which can be seen similar to the study conducted by Sajan et al in which 51% appears to have less knowledge and also says that after providing sufficient information they were much satisfied<sup>9</sup>.

Regarding the essentiality of x-rays in child's treatment, around 84% parents felt that it is essential, as it helps for diagnosis of the disease as well as for future treatments. But around 16% of parents did not had any idea of asking regarding essentiality of X-rays while treatment.

When parents were questioned regarding the harmful effects of radiation, only 70% were aware and the rest of 30% were unaware of the harmful effects as shown in graph 1. This can be compared to the study conducted by Babu et al in 2017, in which he also had found similar lack of sufficient knowledge in the parent population. This may be due to either the lack of an explanation or poor information retention<sup>10</sup>.

Majority of parents feel that radiations from dental x-rays are very much negligible compared to mobile radiations or medical x-rays. This was appreciable as only 6% had felt that dental x-rays can cause harmful effects.

As generally it is considered that exposure to x-rays can damage the overall health, while questioning the parents, 40% feels that it might affect their children, though not today but may be in future. The common risks include development of cancers such as leukemia, thyroid tumors, salivary gland tumors, meningiomas etc as seen in studies conducted by Preston et al in 1990, Memon A et al in 2010.<sup>6</sup>

Children appears to be prone towards the risk of radiation exposure in which, Claus et al 2012, had found that children at younger than 10 years of age have 4.6 fold increased risk of developing meningioma during their lifetime.<sup>11</sup>

## Conclusion

The parents who had participated in this study had sufficient & appreciable knowledge in dental radiography, though had less knowledge in side effects as well as protective equipments that are commonly used. Parents also showed positive attitude & was more co-operative for the study, which shows that they appears to put more trust toward the pediatric dentists, treating their children.

However, it was found that there was a significant lack of knowledge by parents on radiation exposure and its side effects, Thus the need of educating parents regarding the importance of radiation safety on their children is to be mandatorily included by dentists, before commencing dental practices. A large level scale study should be conducted to validate the data of present, as the present study has limited data on parent's knowledge, attitude towards dental radiography.

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