

Assessment of Knowledge and Attitude of Parents Regarding Dental Radiography for Children

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Abstract

Introduction: Radiographs paired with clinical examination help provide an accurate diagnosis of caries, pulp, and periapical pathoses, and reveal problems related to tooth development and eruption. Although radiation dosage from dental radiograph is low, it is one of the most frequently undertaken radiographic procedure. Due to the faith entrusted by the parents on the dentists regarding their children's care, it is the moral responsibility of the dentist to inform about the biohazards associated with radiation to the parents. The aim of the study was to assess the knowledge and attitude of parents toward dental radiography for children.

Materials and Methods: A total of 450 questionnaires were distributed to the parents of children studying in 3 different schools. Children were instructed to get the questionnaires filled by their parents, which were collected after 2 days. The questionnaire included 2 sets of questions, for testing the attitude and knowledge of parents toward radiography for children. The collected data were tabulated and presented in graphical manner.

Results: Among the 357 questionnaires returned, 54 were incomplete and 3 were further excluded. Analysis was performed on 300 questionnaires. More than half of the participants believed dental radiographs are safe and useful. Knowledge of the parents regarding radiography was relatively low. Furthermore, 92% of the parents said that the dentist explained the reasons for undertaking dental X-rays, but only 8% felt that the associated risks were explained to them.

Conclusion: Although parents had a low level of knowledge regarding dental radiography, they had a positive attitude toward the same.

Key words: Attitude, Children, Dental radiography, Knowledge

INTRODUCTION

The discovery of X-rays by Roentgen in 1895 revolutionized the entire medical profession and set foundation for diagnostic radiology. The use of X-rays as a diagnostic tool is so well established that it is hard to imagine contemporary medicine and dentistry without them. The use of dental X-rays is manifold. Radiographs paired with clinical examination help provide an accurate diagnosis of caries, pulp, and periapical pathoses and reveal problems related

to tooth development and eruption.¹ Although radiation dosage from dental radiograph is low, it is one of the most frequently undertaken radiographic procedures.²

According to the 2007 International Commission on Radiological Protection (ICRP) guidelines, the cancer risk associated with dental radiography is 32-42% higher than previously estimated in 1990 ICRP guidelines.³ Studies have showed that diagnostic radiography exposure increases the risk for thyroid cancer and other tumors.^{4,5} Therefore, operators of radiographic equipment should be thoroughly familiar with radiation safety practices and radiation regulations to protect themselves, their colleagues, and the patients.

Due to the faith entrusted by the parents on the dentists regarding their children's care, it is the moral responsibility of the dentist to inform about the biohazards associated

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with radiation to the parents. Children are more vulnerable to radiation than adults, which is due to the fact that there is a longer life expectancy and thus a greater potential for radiation-induced cancers to manifest. Furthermore, the cumulative nature of radiation exposure over a patient's lifetime increases the importance of explaining radiation risks to parents.⁶

Although several studies have been done to test the knowledge and attitude of dental practitioners, physicians, and other allied health professionals regarding radiography, there is not much published literature available regarding the perspective of parents toward the radiographic procedures undertaken for their children. Thus, the aim of the present study was to assess the knowledge and attitude of parents toward dental radiography for children.

MATERIALS AND METHODS

A total of 450 questionnaires were distributed to children studying in three different schools, which were chosen based on convenience. Children were instructed to get the questionnaires filled by their parents, which were collected after 2 days. All the questionnaires were anonymous and a return of filled questionnaire indicated consent from the parent. The questionnaire consisted of 13 items to assess the knowledge and attitude of parents toward radiography for their children.

The first set of questions (questions 1-4) served to evaluate the attitude of parents toward dental radiography. A statement, "I believe dental X-rays for my child are:" was followed by a series of sliding scales with bipolar adjectives at the end of each scale such as harmful-safe, useful-worthless, unpleasant-pleasant, and good-bad. Parents were instructed to place a cross anywhere along the line to best reflected their attitude. These markings were then measured and categorized into three equal groups: Agree, disagree, and undecided (Figure 1).

The next set of questions (questions 5-13) was designed to obtain information regarding the knowledge of parents toward dental radiography. These questions included statements such as benefits from X-rays outweigh the risks, damage to the body from X-rays is permanent, and wearing a lead apron helps protect against radiation damage. It also included questions to assess whether the dentist explains the need for dental X-rays, and the risks associated before taking them. The parents were asked to place a check in either "agree," "disagree," or "I don't know" column. The "I don't know" option was included to allow the participants to acknowledge the lack of information. The

collected data were tabulated and results were presented in graphical form (Figure 1).

RESULTS

Out of the 450 questionnaires distributed, 357 were returned. Among the 357 participants, 54 failed to complete all the questions and were therefore excluded from the study. For ease of calculation, 3 random questionnaires were further excluded and analysis was performed on 300 questionnaires.

To determine the attitude, several elements were measured, namely, the perception of how good, pleasant, useful, and safe radiographs are. Regarding the safety of radiographs, 150 (50%) participants felt that radiographs are safe for their children. Among the remaining 150, 30 participants (10%) found X-rays to be harmful and the rest were unsure. 198 (66%) participants believed radiographs are useful. None of them thought them X-rays are worthless. According to 42 (14%) participants, radiographic procedure for their children is unpleasant, whereas 150 (50%) marked pleasant and the rest were unsure. More than half of the parents (62%) said that X-rays are good while only 8% found them to be bad (Figure 2).

Most the respondents answered "I don't know" to knowledge-based questions. 156 (52%) of the individuals believed that the benefits from dental X-rays outweigh the risks, whereas 34% answered "I don't know" and 14 % answered incorrectly. When asked if the damage to the body from X-rays is permanent, 22% answered correctly, 58% answered "I don't know," and 20 % answered incorrectly. According to 44% of the participants, exposure from dental X-rays is too small to put a child to any significant harm, 2% of the participants thought otherwise, and more than half of the participants (54%) answered "I don't know." 38% of the individuals answered "correct" in response to the statement that children are at a higher risk of harm from X-rays than adults, 44% answered "I don't know," and 18% answered "incorrect." 24% of the participants were aware that exposure to radiation from environment is higher than that from dental X-rays, whereas 58% of the individuals were aware that exposure from medical radiographic procedures is higher than radiation from dental X-rays. Furthermore, 58% of the individuals answered correctly when asked if the child will be protected against radiation damage if he/she wore a lead apron (Figure 3).

Although 92% of the parents said that the dentist explained the reasons for taking dental radiographs, only 8% felt that the associated risks were explained to them.

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Questionnaire

(Place a cross on the line to best reflect your attitude)

I believe dental x-rays for my child are

- 1. Harmful _____ Safe
- 2. Useful _____ Worthless
- 3. Unpleasant _____ Pleasant

- 4. Overall, I believe dental x-rays on my child are
 Good _____ Bad

	Agree	Disagree	I don't know
5. I believe the benefits from dental x-rays outweigh the risks			
6. Most damage to the body from x-rays is permanent			
7. The exposure from a dental x-ray is too small to put my child at any significant harm			
8. Children are at a higher risk of harm from x-rays than adults			
9. Exposure to radiation from the environment (eg. The sun) is higher than radiation from dental x-rays			
10. Exposure to radiation for other medical purposes (eg. Chest x-ray) is higher than radiation from dental x-rays			
11. Children wearing a lead apron while dental x-rays are being taken, will be totally protected against possible radiation damage			
12. Before taking x-rays on my child, dentist explains the risks of dental x-rays			
13. Before taking x-rays on my child, dentist explains why dental x-rays are needed			

Thank you for completing the survey

Figure 1: Questionnaire

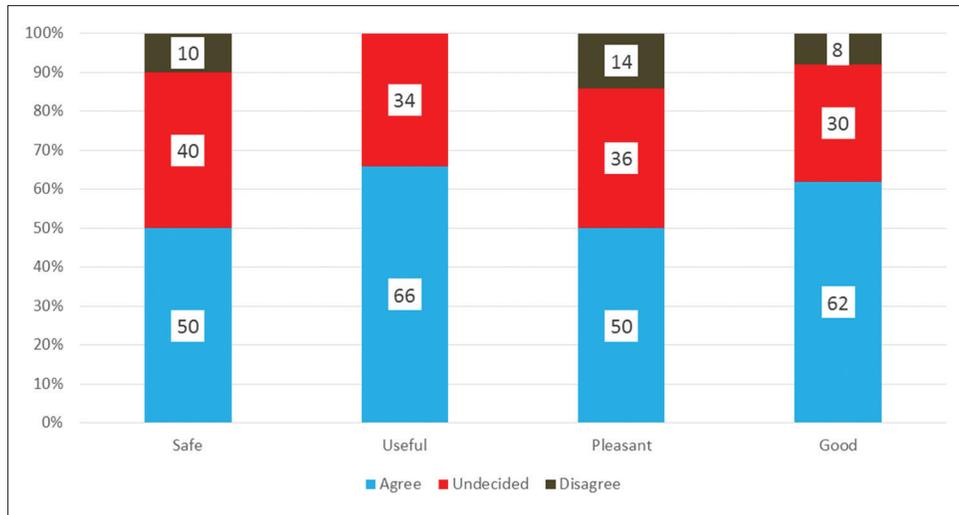


Figure 2: Attitudes of parents toward dental radiographs on their children

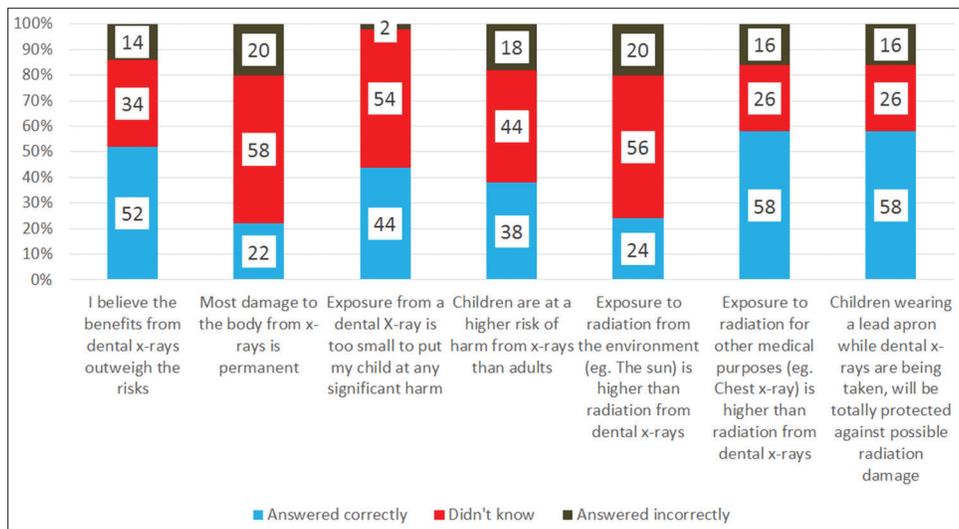


Figure 3: Knowledge of parents toward dental radiography

DISCUSSION

Dental radiographs play an important role in diagnosis and treatment planning. The modalities at the disposal of dentists range from intraoral radiography to cone beam computed tomography. In the field of dentistry, radiation exposure for diagnostic purpose is minimal.¹ However, it is one of the most frequently undertaken radiographic procedures, which is repeated several times during childhood and adolescence. Thus, it is the parent's right to know the associated radiation risks. As per literature available, there are not many studies done to assess the knowledge and attitude of parents regarding dental radiography for their children. Thus, it is unknown whether the fears associated with dental radiography are overstated or the parents are aware about the risks and accept them.⁷

In the present study, an overall positive attitude of parents toward dental radiography was observed. Although many participants placed a cross in the “undecided” zone, only 10% of the participants found X-rays to be harmful and none of them believed dental radiographs are worthless. These findings are similar to those obtained by Chiri *et al.* where 16.5% of the participants found X-rays to be harmful and 3.9% found them to be worthless. In the present study, 14% of the parents stated that dental radiographic procedure for their children is unpleasant and 8% said X-rays are bad, and these values are also similar to those found in the study by Chiri *et al.*⁷

The knowledge of the parents toward dental radiography was found to be relatively low. More than half of the participants were oblivious to the facts such as the damage to the body from dental radiographs is not permanent

(58%) or the exposure from dental X-rays is too small to put their child at any significant harm (54%). 56% of the participants were unaware that the exposure to radiation from the environment (e.g. the sun) is higher than the radiation from dental X-rays. However, 58% of the parents knew that radiation from other medical procedures such as chest X-ray is more and, also that if the child wore a lead apron during dental X-ray procedure, it would provide protection against possible radiation damage. Chiri *et al.* in their study also reported a low knowledge of the parents regarding dental radiography.⁷

The effective dose for a full mouth series (18 images) with F-speed film and rectangular collimation is 34.9 μSv .³ To put these values in perspective, background radiation from naturally occurring radionuclides in our environment and from cosmic rays is approximately 3,100 μSv (NCRP 2000) every year.⁸ Thus, it is important for the pediatric dentists to assure the parents that the benefits of dental X-rays outweigh the risk. In the present study, 52% of the individuals had a similar belief while 14% felt otherwise and the rest (34%) were unsure.

Although 92% of the parents reported that the dentists explained the need for dental X-rays before taking them, only 8% of the individuals felt that the risks associated with radiography were explained to them. According to Chiri *et al.*, in their study, 90.3% parents were informed about the importance of dental radiographs and 39.7% were informed about the radiation hazards. These findings are similar to studies done by Ludwig and Turner and Lee *et al.* who also reported that most people are uninformed about the risks associated with medical imaging.^{7,9,10} This may not be due to lack of provision of information but could also be due to poor retention of information by the parents.

In conclusion, despite the limited knowledge most parents had regarding radiography, they had a positive attitude

toward dental radiography. This low level of parental knowledge emphasizes the need for the dentist to provide appropriate and necessary information including the need for dental X-rays as well as the risks associated with the same before undertaking any radiographic procedure.

CONCLUSION

Although parents had a low level of knowledge regarding dental radiography, they had a positive attitude toward the same.

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