

Original Research Article

The role of information display board in assessing and influencing the knowledge and perception of patients on dental radiography: an institution based prospective cohort study

Rajkumar Couppoussamy^{1*}, Sudhakar Sankaran, Shreenivas Sundar², Nayeem Ur Rahman²

¹Indira Gandhi Institute of Dental Sciences, Sri Balaji Vidyapeeth, Pondicherry, India

²Department of Oral Medicine and Radiology, Asan Memorial Dental College and Hospital, Chengalpet, Tamil Nadu, India

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*Correspondence:

Dr. Rajkumar Couppoussamy,

E-mail: rajkumardent@yahoo.com

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ABSTRACT

Background: Patients gain knowledge about dental radiography from various sources and this can attribute to their perception and attitude. There is a broad conception that the general public have much reservation about dental radiography.

Methods: 300 randomly selected samples visiting as outpatients to oral radiology of our institution were selected for the study. A pilot-tested questionnaire containing 15 questions related to evaluation of knowledge and perception of dental radiography was given to the selected samples and asked to select their choice. Then an information display board related to dental radiography and radiation protection protocols was presented. Following which the questionnaire was redistributed and the study samples were asked to alter the choices of answers, if any. The data obtained were recorded and statistical analysis was done using Shapiro-Wilk and t-test.

Results: Prior exposure to information display, 50% of the participants felt that the x-radiations are harmful and 36% believed that the benefits of diagnostic radiology do not outweigh the potential risk. After the exposure to displayed board containing information regarding dental radiography, 95% acknowledged that the radiographs play a vital role in diagnosis and 85% recognized that the benefits of radiography outweigh its risk.

Conclusions: The findings of the study suggests that the radiology educational display board imparted better knowledge and acceptance of dental radiology protocols among the participants.

Keywords: Information display board, Knowledge and perception, Dental radiography, Prospective cohort study

INTRODUCTION

There is a spectrum of public perceptions related to dental radiography.¹ A few studies revealing positive perception and a few disclosing lack of knowledge on dental radiography.²⁻⁴ Information display related to patient health status in hospitals also resulted in positive response from the patients, their relatives and hospital staff.⁵ Also health education influences the value, belief and attitude systems of the individuals to induce behavioural change.⁶ With this background, this study was started with the objective to know the role of information display board

as an health education tool to know the knowledge, attitude and perception on dental radiography of patients visiting a dental educational institute and to know how it influences their knowledge, attitude and perception on dental radiography.

METHODS

An institution based prospective cohort study was initiated by explaining the need and protocol of the study to the institutional ethical and review board (IERB) with the study duration of six months from May 2021 to

October 2021. After obtaining the approval from IERB, the study questionnaire was prepared and pilot tested with 20 samples. For the original study, 300 random samples belonging to both genders and age above 18 were selected from the outpatients visiting oral radiology department of Asan Memorial Dental College and Hospital, Chengalpattu, Tamil Nadu, India. A power analysis using the G power computer program indicated that a total sample of 300 would be needed to detect large effects ($d=0.20$) with 90% power using mean comparison by Chi-square test with alpha at .05.

Inclusion criteria

All the study samples were selected on voluntary basis from patients needing the dental radiographs after taking into account their history and examination findings

especially pulpo-periapical lesions from ages above 18 years.

Exclusion criteria

Those patients not needing the dental radiographs are excluded like patients with dental plaque induced gingivitis, oral mucosal lesions and also patients with oral and maxillofacial trauma.

A set of questionnaires containing 15 questions pertaining to dental radiography was given to the study samples. The questions were related to evaluation of participant knowledge, understanding their attitude and experience and assessing their perception. The questionnaire was in both in English and Tamil (the regional language) (Figure 1).

Figure 1:		Figure 2:	
THE ROLE OF INFORMATION DISPLAY BOARD IN ASSESSING AND INFLUENCING THE KNOWLEDGE AND PERCEPTION OF PATIENTS ON DENTAL RADIOGRAPHY – AN INSTITUTION BASED PROSPECTIVE COHORT STUDY. Name of the Patient: _____ Age/Gender: _____ Occupation: _____ Educational Qualification: _____ Address: _____ 1. Your knowledge of dental radiography is through? a. Distant b. Family members c. Friends d. Newspapers/Magazines etc 2. Have you taken dental radiograph before? a. Yes b. No c. Can't remember. 3. Reasons for today's radiographic examination? a. Screening radiograph b. c. to identify dental disease b. To evaluate/analyse the growth of jaw d. Don't know 4. Do you think dental radiographic examination is largely helpful for diagnosis and management of oral diseases? a. Yes to a great extent c. No b. Yes to limited extent d. Don't know 5. Do you know the need for removal of metallic concerns during dental x-ray (radiographic) examination? a. Yes, it will interfere with x-ray passage and obscure important findings b. Don't know 6. Did you notice any warning signs or sign boards related to x-ray hazards within the hospital premises? a. Yes b. No 7. Is dental x-ray (radiography) harmful to the body? a. Yes, very harmful b. yes, to some extent c. No d. Don't know		1. Is dental x-ray (radiography) harmful to the bystander (accompanying person)? a. Yes, very harmful b. yes, to some extent c. No d. Don't know 2. Can pregnant women undergo dental x-ray (radiographic) examination? a. Yes, it doesn't matter c. Yes, under radiation protection methods b. No d. Don't know 3. Can children undergo dental x-ray radiographic examination? a. Yes, it doesn't matter c. Yes, under radiation protection methods b. No d. Don't know 4. Do you think this radiology section follows radiation safety measures? a. Yes b. No c. Don't know 5. Do you like to follow the radiation safety measures? a. Yes b. No, not required c. no idea about the radiation protection methods 6. Do you think the benefits of x-ray examination outweigh the possible risks? a. Yes b. No c. Not sure 7. Do you think the dental x-ray examination is safer in comparison with the medical x-ray examination? a. Yes b. No c. Not sure 8. What according to you are the harmful effects of radiation? a. Cancer b. birth defects on the developing fetus c. Can cause sterility (reduction in sperm count) on males d. All of the above 9. Not sure	

Figure 1: The role of information display board in assessing and influencing the knowledge and perception of patients on dental radiography: A) English; B) Tamil.

[illegible]

Figure 2: Information display board-2 on dental radiography.

ஆசனம் பல் மருத்துவமனை - பல் ஊடுகதிரியக்க பிரிவு
எக்ஸ் கதிர்கள் மற்றும் அதன் மருத்துவப் பயன்பாடுகள்

எக்ஸ்ரே அல்லது எல்வ் கதிர்கள் விடுதலும் சென்ட்ரல் ராண்டிஜன் என்பவரால் 1895-ம் ஆண்டு கண்டுபிடிக்கப்பட்டது. இவை மிகவும் அலகை ஆற்றல் வாய்ந்த கதிர்கள் ஆகும். இவை இரும்பு போன்ற உலோகங்களைத் தாண்டி செல்லும் வலிமையுடையன. மருத்துவம் மட்டுமல்லாமல் பிறத் துறைகளிலும் இவை பயன்படுத்தப்படுகிறது.

எல்வ் கதிர்கள் நோய்க்காட்டில் செல்லும் போதும், பின்னர் பெற்றோர் தந்தைவன் மருத்துவத் துறையில் நோயறி கதிரியியல் கதிர்ப்பயன் அதிகப் பயன்படுத்தப்படுகிறது. எக்ஸ்ரேகளைத் தம் கண்மூக்குத் தெரியாமல் உயிர்மீள் கண்டுபிடி அமைந்தவர் பெயர் எவர்க்கம்பட்ட. இவருக்கும் பிலிம் அட்டை அல்லது தகவல் சென்று அமட்டும்.

இரும்பு எடுக்கப்படுகிற எக்ஸ்ரே உகவனின் மூலம் தளம், பற்கள், முள்ளெலி வேடி பகுதி மற்றும் அதனை கற்றியான எலும்பு பகுதியில் வளைந்திருக்கிற மார்பியைப் பற்றியும் உள்ள எலும்புகள் கட்டிடம் இதன் மூலம் உங்கலுக்கு மிக சரியான முறையில் சிகிச்சையளிக்க உதவுகிறது. இதுகூடும்.

எக்ஸ்ரே ஸ்கேன் எடுப்பதற்கு முன்னர் எக்ஸ்ரே கதிர்வீசலின் பாதுகாப்பில் வருக. உகவனின் ஆயுறான மற்றும் உலோக அணிகலன்களைக் கவிரிந்து எவர்க்கம்பட்ட இல்லஸெயிஸில் அணிகலன்களின் அடர்த்தியினால் பல் மற்றும் எலும்பு பகுதிக்கு மருத்துவ மனம்க்கப்படுகிறது.

பல் எக்ஸ்ரே ஸ்கேன் இடுவகையப்படுகிற பிரிய வளக ஸ்கேன் மற்றும் பெரிய வளக ஸ்கேன் பிரிய வளக ஸ்கேன் எடுப்பதற்கு உபயோகம். அருகில் எவர்க்கம்பட்ட இதன் மூலம் மார்பியை உள்ள இடத்தை உகவ் மிக சரியாக பார்க்கமுடியும்.






பெரிய வளக ஸ்கேன் எடுப்பதற்கு பெரிய வக ஸ்கேன்களையி பயன்படுத்தப்படும். பெரிய வக ஸ்கேன் எடுப்பதன் மூலம் அரைதரத் துறையின் தளம், பகுதியின் முழுமையாக பார்க்கப்படும். பெரிய வக ஸ்கேன் மருத்துவ மருத்துவ கருவியில் எடுப்பும் உகவ் வலிமையுடைய கதிர்வீசல் திறக் கண்டுபிடி அமைந்தார். அவர்போன்ற உகவனின் வலுத் திறத்தால் மருத்துவ மனம் பார்க்கும் மல்டி மூலத்தால் எக்ஸ்ரே வெளியாகக் கருக்கப்படும். இதுவகம் இவ்வ துறையில் எக்ஸ்ரே ஸ்கேன் உபயோகம் பார்க்கும் உகவ் வலிமையுடைய கதிர்வீசல் கருவியைக் கண்டுபிடி அமைந்தார். இதுவகம் பார்க்கும் உகவ் வலிமையுடைய கதிர்வீசல் கருவியைக் கண்டுபிடி அமைந்தார்.

எக்ஸ்ரே ஸ்கேன் எடுக்கி பின் பிலிம் வடிவில் தயார் செய்யக் கமார் 10 முதல் 15 நிமிடம் வரை ஆகலாம், அது வளை போதுமையாக இருக்கவும்.

க.ராஜா வெய்யம்பா - பரிநிதி மருத்துவரர் (2014 - 2019)

Figure 3: Information display board-2 on dental radiography.

Any patient who had difficulty in reading the questionnaire was assisted by the author (Rajkumar Couppoussamy). Each questions had 2-5 related answers, the study samples were asked to select the options of their choice in the space provided in the response sheet. The samples were then asked to read the display board (placed in the radiology outpatient waiting area) containing information about the dental radiology and radiation protection protocols (Figures 2 and 3).

The response sheet of the samples were redistributed and asked to modify answers, if any. The data collected were recorded in a Microsoft excel spread sheet (windows version 2008) and statistical analysis was done using SPSS version 23. Initially frequency distribution, followed by Shapiro-Wilk and t-test was done to test the normality of frequency distribution and to know the difference between the means of two sets of data respectively.

RESULTS

Among the 300 samples, 178 (59%) were males and 122 (41%) were females. The age group 21-30 years (35%) were predominant and the least age group was 70-80 years (5%). Majority of the samples (52%) had higher secondary school level education, followed by college/university level education (43%) and only very few (5%) were illiterates. 61% of the study samples were either self-employed or salaried, followed by 29% students and the remaining 10% were home-makers or unwaged. Responses prior to exposure to information display board on dental radiography. With regard to evaluation of knowledge, majority (70%) of the participants stated that they have received awareness about dental radiograph through Dentist followed by 15%

through their friends/relatives. 80% of them stated that the reason for today's radiographic examination is for disease evaluation and about 15% did not have any idea about their visit. Around 50% of the participants felt that dental x-radiation is harmful to the body however, 65% of them had no idea or felt that x-radiation does not have any effect on bystanders. In context to attitude and experience, 55% of the participants had previous radiographic experience and majority (75%) of them stated that radiographic examination plays a key role in diagnosis. However, only 30% and 60% felt radiographic examination can be done for pregnant women and children respectively. Surprisingly, 53% of them were ready to remove ornaments during radiographic exposure. With regard to perception, 77% felt that all necessary radiation protection measures have been taken in our premises and 45% believed dental x-radiation are safer than medical diagnostic X-radiation. However, 50% of the participants felt that the X-radiations are harmful and 36% believed that the benefits of diagnostic radiology do not outweigh the potential risk. Surprisingly, 70% do not know about radiation induced disease and only 28% stated cancer, defect on foetus and sterility.

Responses after exposure to information display board on dental radiography. Almost all the participants accepted diagnostic radiographic examination for children and pregnant ladies (100 and 95% respectively). Similarly, 95% acknowledged that the radiographs play a vital role in diagnosis and 85% recognized that the benefit of radiography outweigh its risk. Another noteworthy observation is that 64% of the participants augmented further knowledge on radiation induced conditions/diseases. Surprisingly, only few were ready to change their mind regarding the harmful effects (20%) and bystander effects of radiation (7%) (Figure 4).

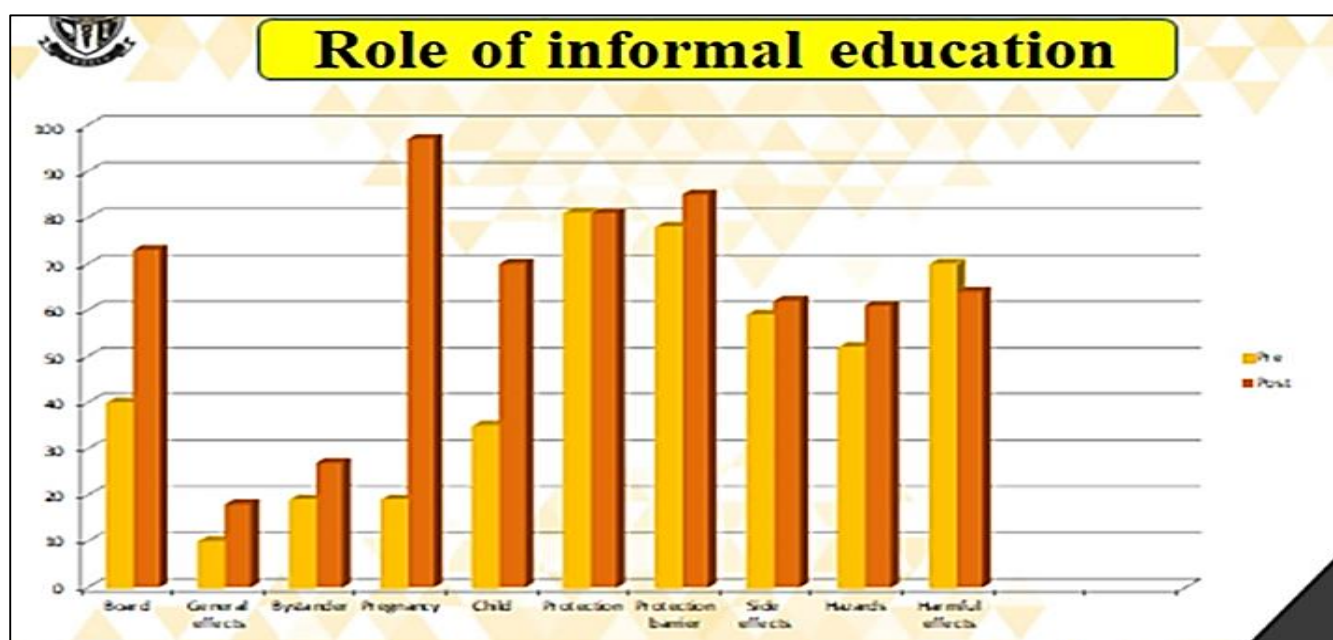


Figure 4: Role of informal education.

DISCUSSION

Misconceptions, misbelief and taboos have been a social stigma forever. It is believed whether you are young/old, educated/uneducated, male/female all have fallacies about dental radiography. In the past, a few studies have highlighted certain misconceptions related to knowledge, attitude and perception of dental radiography among different population groups. However, efforts to eradicate and educate the general public towards these fallacies were not documented. In this regard, the current study was planned in two-steps: first the baseline knowledge, attitude and perception (KAP) was evaluated through a questionnaire then the patient was reassessed (with the same questionnaire) after reading the informal education posters.

The questionnaire utilized in the study included questions to evaluate the general public's KAP about dental radiography and radiation protection protocols. This questionnaire was a modified version (with few adapted questions and several additional questions) to the one existing in the literature and by virtue of it, many findings were non-comparable. On the hindsight few interesting observations were also made which added a new insight to the existing literature.

The current study observed that most patients (70%) received the information regarding dental radiographs from their dentists. This is very much higher than the studies conducted by Ashok et al (47%) and Purmal et al (48%).^{1,2} With regard to knowledge on utility of radiographs, 75% of our study population opined it is necessary to take radiographs. This is in analogous with the study by Ashok et al (68%), Daniel C et al (78%) and Purmal et al (66%).⁸⁻¹⁰ Similarly, in the present study many patients (80%) knew even the reason for their dental x-ray examination. This finding is in concordance with Purmal et al (78%) and higher than Ashok et al (65%).^{8,9} Interestingly, although many of our study participants knew the need for radiographic examination only 55% of them had taken radiographs before. This is very much less when compared with Ashok et al (85%) and Purmal et al (74%).^{8,9}

With regard to perception on harmful effects of radiation, 50% of our study samples expressed that x-radiations are harmful and similar observations (32%) were noted with Purmal et al and Ashok et al.^{8,9} Almost 65% of our study samples stated that they do not have any idea about the bystander effect of radiation. However, 45% participants indicated that the dental x-ray examinations are safer than medical x-ray examination. Ironically, most of our study participants (70%) believed that pregnant individuals should not undergo dental radiographic examination (Ashok et al and Purmal et al- 80% and 57% respectively).^{8,9} Similarly 40% of our study population expressed unwillingness for paediatric dental radiographic examination, the same was observed with Ashok et al (37%) and Purmal et al (16%).^{8,9}

Another remarkable observation in our study is that only 40% of the participants noticed the radiation hazard symbol pasted in the department. Although this finding appears to be better than Ashok et al (8%), the outcome necessitates healthcare providers to put in more strenuous effort like placing them in as many as places possible and describing the logo in local vernacular language etc. Even though 60% of the samples did not observe or understand the radiation hazard symbol, 77% felt that the radiation protection protocols were adhered in the department. Almost 80% of the study population were ready to follow additional radiation protection protocol methods and 53% were ready to remove ornament during radiographic examination.

In general, the study observed that there was no obvious difference in knowledge among different age groups, gender and educational status of the study population and this is in agreement with the studies conducted by Ashok et al, Purmal et al and Azad et al 2017.^{8,9,11} The participants appear to have a positive attitude and reasonable knowledge towards the use of ionizing radiation and radiation exposure and this is in concordance with Ugwuanyi et al.¹⁰ However, the study also observed that the participants have a few misconceptions and belief related to certain aspects of dental radiology. Thus, as per the study design all the participants underwent exposure to information display on dental radiography.

As about limitation of the study only the literate persons were included in the study and also visually impaired and mentally challenged were not parts of the study.

CONCLUSION

To conclude, in the present study after informal education, 75% of the study samples recognized radiation hazard symbol. Many participants expressed willingness for dental radiographic examination of pregnant women (90%) and children (70%). It was appreciable that many participants had gained additional knowledge on radiation protection protocols, ill effects of x-radiation and more importantly certain misbelief related to harmful effects of x-radiation has been curbed. The findings of the study suggests that the radiology educational display board imparted better knowledge and acceptance of dental radiology protocols among the participants and as an extension of the study this information display board can be used in public places to create awareness to the public in general regarding dental radiography.

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