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ASSESSMENT OF KNOWLEDGE, ATTITUDE AND ADHERENCE TO RADIATION SAFETY MEASURES AND RADIOLOGICAL WASTE MANAGEMENT AMONG MAPPED MANPOWER ASSISTING DENTAL PRACTITIONERS IN WARDHA DISTRICT: A CROSS SECTIONAL STUDY.

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Abstract:

Background: Oral and maxillofacial imaging has been long an indispensable component while diagnosing in dentistry. The biologically hazardous or adverse effects on human body are well documented. This warrants judicious use to avoid its harmful effects. Manpower assisting dental practitioners in routine private dental practice in India is an unmapped manpower.

Aim: This is a maiden attempt to map manpower assisting dental practitioners in private dental clinics along with assessment of their knowledge, attitude and adherence to radiation safety measures and radiological waste management in Wardha.

Methodology: This cross-sectional study will utilize 26 point structured; validated and pre-tested questionnaire regarding knowledge, attitude and adherence to radiation safety measures and radiological waste management.

Statistical analysis: The data collected will be computed and chi square test, unpaired t test, one way ANOVA followed by post hoc test and Pearson's correlation coefficient will be used appropriately for statistical analysis.

Implications: At the end of study, mapping of manpower assisting dental practitioners will be done. The degree of knowledge, attitude and adherence to radiation safety measures and radiological waste management among manpower assisting dental practitioners will be obtained and the findings can be shared with apex council for the designing and implementation of formal training program for these dental assistants.

Key words:

Radiation safety, radiation hazard, radiology waste, dental assistants, occupational hazard

INTRODUCTION

Oral radiography is an indispensable part of diagnostic tools in the field of dentistry. The hazardous effects of X-rays on human body have been well documented. [1,2] This necessitates judicious use of radiation modalities. As ALARA-principle states, the patient's radiation dose must be optimized to a degree which is as low as reasonably achievable.[3] Numerous protection guidelines have been set by different organizations worldwide and clinical trainings are given to dental students as a part of their academic curriculum for educating them towards the radiation hazards and the risks-reduction methods.[4,5] Though advances in technologies have reduced radiation doses considerably, negligence has been observed seen on part of the professionals when it comes to application of their knowledge and following the policies to keep a check and reduce the adverse health effects from the radiations.[6-8]

Radiographic films and processing solutions are used in conventional radiography which leads to generation of radiographic wastes. These wastes can be broadly classified as solid wastes including lead and silver whereas the primary effluent is soluble silver which if unprocessed and discharged into environment is immensely hazardous. [9]

The silver contaminating the ecosystem ultimately shows up in human body through food chain. It causes changes in blood cells, fatty degeneration of organs especially kidney and liver, bluish-gray discoloration of the skin and eyes and can accumulate in the brain and muscles.[10] Knowledge on radiographic waste management is sadly poor amongst the dental practitioners [11-13] who dispose the wastes in the same route as other non-toxic wastes inadvertently polluting the environment.

Now is the era of 4 or 6 handed dentistry. Therefore manpower assisting dentist in dental operating room has become vital part of any dental clinic. In India, most of the private dental clinics hire assistants for dental operating room without any professional qualification. The trend is to hire and train the personnel according to the needs of clinic. This assistant is given the responsibility to assist the dentist in all the clinical work related to the patient. Pertaining to radiography, the role of assistant often includes helping dentist in taking a dental radiograph, its development and radiological waste management.

The dentists are trained thoroughly in their curriculum and through CDE programs updated

regularly regarding radiation safety measures and radiological waste management. But the dental assistants' training and capacity building in this context is questionable. As an employer, the onus is on hiring dentist to train the assistant regarding various protocols to be followed during radiography, regarding waste management, appropriate use of personal protective equipments, sterilization and disinfection of equipments and instruments and maintenance of hand as well as personal hygiene. The people being employed as assistant vary in their educational qualifications ranging from uneducated to post graduate qualifications.

Literature review showed that the knowledge, attitude and practices of dentists pertaining to radiation safety and radiological waste management were deficient, inadequate or poor.[11-17] The paucity of research data regarding the knowledge, attitude and adherence to radiation safety measures and radiological waste management among assistants for dental operating room has been observed to the best of investigator's knowledge. Also there is paucity of data regarding their educational qualification status of the personnel being employed as assistants for dentist. Therefore, this study is a sincere attempt to map the manpower and determine dental assistant's knowledge, attitude and adherence to radiation safety measures and radiological waste management in Wardha district to obtain base line data.

METHODOLOGY

This cross sectional study will be accomplished among manpower assisting dentist in private clinics of Wardha District after obtaining ethical approval from Institutional Ethical Committee. The study duration will be 6 months from November 2019 to April 2020. Dental assistants are defined as the manpower assisting dentist in the procedures related to the patient care such as case registration, case history record maintenance, sterilization and disinfection, assisting in examination, radiography and clinical procedures, manipulation of various dental materials, biomedical waste management etc. Those at least 19 years of age and willing to partake in the study will be included while others with work experience in dental clinic of less than 1 year and submitting incompletely filled questionnaire will be excluded.

Depending upon the capacity of the dental clinic, the number of dental assistants ranges from no to multiple personnel. Therefore, all the private dental clinics in Wardha district will be contacted and dental assistants will be asked to participate in the study.

A pretested, validated, structured close ended questionnaire in close ended format will be designed in English after carrying out and collecting data through comprehensive literature search. The questionnaire will have following domains respectively: demographic details, knowledge, attitude, and practice. Validity and reliability assessment will be done with the help of subject matter experts. This questionnaire will be then translated to Marathi which is a local language by 3 bilingual translators. The questionnaire in Marathi will be back translated to English by another independent translator. Discrepancies between the original language and Marathi language will be noted, reviewed and resolved by the translators to confirm equivalence. The questionnaire will then be subjected to pre-test to assess the simplicity, perceptibility and comprehensibility.

Test-retest method will be used for assessing reliability and stability of the questionnaire. Internal consistency will be evaluated using Cronbach's alpha value for the aforementioned three sections. Thus, a final pre-tested, validated, close ended, self-structured and self-administered questionnaire will be prepared.

Study participants will be approached in the dental clinics and introduced about the research project. Written informed consent will be obtained and self-administered questionnaire will be given to be

filled. The questionnaire will be collected back the next day from the respondent. The data will be entered in Microsoft Excel spread sheet.

For knowledge based questions scoring, each correct answer will score 1 mark while incorrect answer will score 0 mark. If participants scored ≥ mean score of the correctly answered questions it will be categorized as knowledgeable whereas score < mean score of the correctly answered questions will be categorized as not knowledgeable. Attitude will be assessed with five point Likert's scale. The scores given will be strongly agree = 5 to strongly disagree = 1 where positive response will be correct attitude whereas when the correct attitude will be negative response, the coding will be reversed i.e. strongly agree = 1 to strongly disagree = 5. Similar to knowledge based questions, total score of attitudinal questions will be computed and then, participants with ≥ mean score were categorized as having good attitude and poor attitude if participants scored < mean score. Correct practice will secure 1 mark and incorrect practice will secure 0 marks. Total practice scores will be computed and participants score ≥ mean score will be categorized as good practice and poor practice if scores will be < mean score.

Data obtained will be entered in Microsoft excel sheets. SPSS version 20 will be utilized for statistical analysis. The results of descriptive analysis will be tabulated and represented as graphs as deemed appropriate. For comparison between groups Chi square test will be used. Unpaired t test and ANOVA will be used to compare means appropriately. Evaluation of the relationship between knowledge, attitude and practices will be done using Pearson's correlation coefficient.

IMPLICATIONS:

The results will depict the picture regarding the knowledge, attitude and adherence to radiation safety measures and radiological waste management among mapped manpower assisting dental practitioners in Wardha district. If the results suggest poor knowledge, attitudes and practices, the findings can be referred to apex council for designing a competency based certificate course for manpower assisting dental on radiation safety measures and radiological waste management for the manpower assisting dental professionals in the clinic before recruitment. Also guidelines regarding the periodic mandatory up gradation by means of attending continuing dental education programs to enhance the standards can be drafted. This will pave road for dental professionals to internalize quality assured health standards in their routine professional practice, to ensure occupational and environmental safety for themselves and the personnel working in the dental clinic.

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