KNOWLEDGE, ATTITUDE AND BEHAVIOUR OF PATIENTS VISITING UNIVERSITY OF NAIROBI DENTAL HOSPITAL TOWARDS RISKS OF DENTAL X-RAYS

BY

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BDS III

A COMMUNITY DENTISTRY PROJECT PROPOSAL SUBMITTED IN PARTIAL FULFILMENT OF THE DEGREE OF BACHELOR OF DENTAL SURGERY, 2001
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BDS III 2000/2001

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### LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>B.D.S.</td>
<td>Bachelor of Dental Surgery.</td>
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<td>F.D.S.</td>
<td>Faculty of Dental Sciences.</td>
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<tr>
<td>U.O.N.</td>
<td>University of Nairobi.</td>
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<tr>
<td>Sv.</td>
<td>Sievert - Unit for measuring radiation</td>
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<tr>
<td>Gy.</td>
<td>Gray - Unit for measuring radiation</td>
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<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus.</td>
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<tr>
<td>AIDS</td>
<td>Acquired Immunodeficiency Syndrome.</td>
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SUMMARY

Although studies have been done to determine the various side effects of X-rays. No data is available on the knowledge, attitude and behaviour of patients towards these side effects. A descriptive cross-sectional study will be conducted to determine the knowledge, attitude and behaviour of patients towards the various risks.

Convenient sampling method will be employed in interviewing 92 patients. A semi-structured questionnaire will be used for the interview. Results will show the level of knowledge, attitude and behaviour of patients and shed light on how much of health education is needed by the population.
INTRODUCTION

X-rays refer to electromagnetic radiation of extremely short wavelength with great penetrating powers in matter opaque to light. They are produced when high energy beams of electrons strike matter, and are used in diagnosis in the technique of radiography(1). X-rays are also used in radiotherapy.

Everyone is exposed to some form of ionizing radiation from the environment in which we live. Sources include:

- Natural background radiation e.g. Gamma radiation from the rocks and soil in the earth’s crust.
- Artificial background radiation e.g fallout from nuclear explosions.
- Medical and dental diagnostic and therapeutic radiation.
- Radiation from occupational exposure(2).

The use of X-rays is an integral part of clinical medicine and dentistry with some form of radiographic examination being necessary on the majority of patients. As a result, radiographs are often referred to as the clinician’s main diagnostic aid. On controlled doses, they are beneficial, although they are associated with some biologically damaging effects(2).

Exposure of the entire body to a large radiation dose, over 1sv in a single exposure or within one or two days results in a progressive series of signs and symptoms known as the acute radiation syndrome. There follows a latent period after the prodromal symptoms which may last up to about 3 weeks depending upon the dose. After this, the characteristic effects of radiation damage become evident and these include:

- Anorexia
- Fatigue
- Malaise
- Epilation
- Fever
- Infections
- stomatitis
- haemorrhagic phenomena
• Temporary sterility for up to one or two years may be present at doses of about 2 Gy or more to the gonads\(^{(3)}\).

Although recovery of acute effects may be complete without sequelae, there remains the possibility of long-term or late effects of radiation exposures. Some of them occur only after doses exceeding a certain threshold level. Examples include:

1. Chronic radiodermatitis - Results in a dry, hairless, red, atrophic skin with Numerous telangiectatic areas.
2. Cataracts - Results since the lens of the eye is especially sensitive to Radiation when uniformly irradiated.
3. Sterility - Below the threshold dose, these types of radiation Damage are not apparent. Above the threshold, the effects are roughly proportional to the dose\(^{(3)}\).

Other types of long-term effects have been observed to occur with an increased incidence that is proportional to the dose. These include:

• Carcinogenesis - this is the major late health effect.
• Genetic effects - changes in the individual genes.

If the involved gene is in a germinal cell of the testis or ovary, it can produce a heritable mutation leading to developmental disturbances such as, mental retardation and malformations in the unborn child. This is especially so during the pre-implantation period (nine to 10 days after conception) and during the period of major organogenesis (second to 6\(^{th}\) week of gestation in human beings)\(^{(3)}\).

For health protection purposes, it is assumed that such risks are present for any and all doses without regard to a threshold dose\(^{(3)}\).

In dentistry, the size of the doses used routinely are relatively small and well below the threshold doses required to produce the certainty effects (those that become apparent after the threshold dose is reached). However, the somatic stochastic effects such as cancers and genetic stochastic effects such as mutagenesis can develop with any dose of ionizing radiation. Also, dental radiography does not usually involve irradiating the reproductive organs and therefore, in dentistry, somatic stochastic effects are the damaging effects of most concern. However, accidental high doses in dentistry can cause the somatic non-stochastic effects such as skin
reddening and cataracts, while lack of protection of the gonads e.g. by use of lead aprons can cause the genetic stochastic effects\(^2\).

Dental X-rays therefore, if not well handled, can cause all the harmful effects associated with X-rays. The aim of this study is to determine the knowledge, attitude and behaviour of patients towards risks of dental X-rays and whether the knowledge is translated to good behaviour.

**LITERATURE REVIEW**

Studies done in the past include those on:


There was no research study discovered on knowledge, attitude and behaviour of patients towards risks of dental X-rays. This study therefore acts as a background study.

**PROBLEM STATEMENT**

Out of the researcher's own observation, the X-ray Department in the University of Nairobi (U.O.N.) Dental Hospital, is one of the busiest Departments with majority of patients from all other clinics requiring some form of radiographic examination.

X-rays are usually termed as 'clinician's main diagnostic aids', but have disadvantages in that they are associated with some harmful effects. With the fetus being particularly sensitive to X-rays, expectant mothers are usually not an exception. Also, with some harmful effects being directly proportional to the dose of X-rays, repeat X-rays are also common.

Questions which promoted this study were whether expectant mothers usually enquire about the safety of the fetus, whether patients ask why X-ray have to be repeated, how frequently patients get exposed to X-rays, and whether patients are aware of the risks associated with X-rays.
STUDY JUSTIFICATION
Since no similar study has been conducted in Kenya, there is need to assess the knowledge, attitudes and behaviour of patients towards the risks associated with dental X-rays. The information acquired would help in organizing health education programmes to educate the population on what affects the prevalence and incidence of those risks.

MAIN OBJECTIVES
To determine patients' knowledge, attitude and behaviour towards risks of dental X-rays.

VARIABLES INVESTIGATED

Independent Variables
(i) Age of the patient.
(ii) Sex of the patient.
(iii) Patient's level of education.

Dependent Variables
Knowledge, attitude and behaviour of patients towards risks of dental X-rays.

Hypothesis
More than 50% of patients have poor knowledge and behaviour towards risks of dental X-rays.

MATERIALS AND METHODS

Study Design
A cross-sectional descriptive study will be carried out.

Study Area
The study will be conducted at the U.O.N. Dental Hospital in all the clinics. The U.O.N. is the largest public university in Kenya. The University Dental Hospital is where undergraduates in dental surgery are trained. The Hospital is located on Argwings Kodhek Road. The Hospital provides dental services to people from Nairobi and neighbouring areas and also referrals from District and Provincial hospitals countrywide.
Study Population
This will include all patients above 18 years presenting in the hospital who consented to the study. A minimum of 40 patients are attended to in the hospital everyday. Some patients visit the hospital without having been referred.

Sample Size Determination
The modified Dobson’s sample size formula was used.

\[ n = \frac{NZ^2pq}{n(N-1) + Z^2pq} \]

Where
- \( n \) = minimum sample size required.
- \( N \) = study population (40 patients per day x 3 days = 120).
- \( p \) = prevalence (50%).
- \( d \) = 100 – confidence level.
- \( z \) = 1.96
  Confidence level = 95%.

\[ n = \frac{120 \times (1.96)^2 \times 0.5 \times 0.5}{(0.05)^2 \times (120-1) + (1.96)^2 \times 0.5 \times 0.5} \]

\[ n = \frac{120 \times 3.8416 \times 0.25}{0.0025 \times 119 + 3.8416 \times 0.25} \]

\[ n = 115.248 \]

\[ n = 92 \text{ patients} \]

Sampling
Researcher administered questionnaires will be given to every patient who meet the inclusive criteria. Convenient sampling procedure was done. Data collection took 3 days. A minimum of 40 patients were interviewed daily.

Only 89 questionnaires were analyzed, 19 were discarded for they were incomplete.
DATA COLLECTION INSTRUMENTS
A semi-structured, closed with open-ended question questionnaire will be used. It will be researcher-administered.

DATA ANALYSIS
Data will be analyzed manually and presented in tables.

INCLUSIVE CRITERIA
Inclusions
(i) Patients visiting all clinics in the U.O.N. Dental Hospital, aged 18 years and above who will consent to the study.

Exclusions
(i) Patients below 18 years of age.
(ii) Patients who will not consent to the study.

ETHICAL CONSIDERATIONS
(i) Failure to consent will not affect patients’ treatment requirements.
(ii) Consent will be sought from the patients.
(iii) Confidentiality of the information given will be assured.

LOGISTICS
(i) Financial constraints
(ii) Limited time of study.

PROPOSED BENEFITS
(i) Results will show the level of knowledge, attitudes and behaviour of patients towards risks of dental X-rays and therefore shed light on how much health education is needed by the population.
(ii) Report will be submitted for partial fulfillment of the requirements of Bachelor of Dental Surgery degree in the U.O.N.
## BUDGET

### ITEM

1. Proposal development
   - Foolscaps: 260.00
   - Typing and printing services: 1,000.00
   - Binding: 70.00
   - Internet services: 400.00

2. Report development
   - Foolscaps: 260.00
   - Typing and printing services: 1,500.00
   - Binding: 70.00
   - Internet services: 500.00
   - Questionnaires: 1,000.00
   - Photocopy services: 100.00
   - Miscellaneous: 250.00

**Total**: 5,310.00

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APPENDIX I

REFERENCES


APPENDIX II
QUESTIONNAIRE

KNOWLEDGE, ATTITUDE AND BEHAVIOUR OF PATIENTS TOWARDS RISKS OF DENTAL X-RAYS

1. Age: ..............................................

2. Occupation: ..............................................

(Tick as appropriate)

3. Sex:  Male  Female

4. Level of Education:
   (a) Primary  
   (b) Secondary  
   (c) ‘A’ Level  
   (d) College/University  
   (e) Others, specify ..............................................

KNOWLEDGE

5. Have you ever been X-rayed?
   Yes  No

6. Do you know what X-rays are used for?
   Yes  No

7. If yes, in 6 above, for which of the following reasons can X-rays be used?
   (a) Knowing what problems the patient has. 
   (b) As a form of treatment

8. Do you think when taking X-rays irrelevant areas should be protected?
   Yes  No  I don’t know

9. If no, go to number 10.
   If yes in 8 above, why? ..............................................

10. Do you think X-rays can be harmful?
    Yes  No  I don’t know

11. If no, in No.10 above, go to number 14.
    If yes, in No.10 above, which of the following are possible harmful effects of X-rays?
        (a) Loss of appetite
        (b) Vomiting
        (c) Diarrhoea
        (d) Skin damage
        (e) Blood changes
        (f) Loss of hair
        (g) Tiredness
        (h) Raise in body temperature
        (i) Ulcers in the mouth
(j) Bleeding tendencies
(k) Damage to the eyes
(l) Temporary loss of fertility
(m) Abnormalities of organs in the unborn child
(n) Mental retardation in the unborn child
(o) Cancers
(p) Others specify

12. Do you think dental X-rays can be harmful?
Yes ☐  No ☐

13. If no in No.12, above, go to number 14.
   If yes, in No.12 above, which of the following are possible harmful effects of dental
   X-rays?
   (a) Damage to the skin ☐
   (b) Damage to the eyes ☐
   (c) Abnormalities of organs in the unborn child ☐
   (d) Mental retardation in the unborn child ☐
   (e) Cancers ☐
   (f) Others, specify ☐

14. Do you think it is important to inform the doctor or radiographer that you are pregnant in case of a
   proposed X-ray? (Not applicable for male)
   Yes ☐  No ☐  I don’t know ☐

15. If yes in No.14 above, why? ☐
   If no in No.14 above, why? ☐

ATTITUDE

16. Should the doctor explain why he or she would want you X-rayed?
   Yes ☐  No ☐

17. Would you want X-rays to be substituted with other means of examining the body where possible?
   Yes ☐  No ☐

18. If no in No.17 above, go to No.19.
   If yes in No.17 above, why? ☐

19. Do you think it is safe for one to be X-rayed during pregnancy?
   Yes ☐  No ☐  I don’t know ☐

20. If yes in No.19 above, why? ☐
   If no in No.19 above, why? ☐

21. Would you want to be educated more about X-rays by your health care providers?
   Yes ☐  No ☐
BEHAVIOUR

22. Have you ever been X-rayed?
   Yes ☐  No ☐

23. If yes, did you ask why the X-ray had to be taken?
   Yes ☐  No ☐

24. If no, in No.23 above, why?
   (a) It was not important ☐
   (b) Doctor had explained ☐
   (c) I feared asking ☐
   (d) Others, specify ...............................................................................

25. Have you ever been X-rayed while pregnant? (not applicable for male).
   Yes ☐  No ☐

26. If yes in No.25 above, did you ask whether it was safe to have the X-ray taken?
   Yes ☐  No ☐

27. If no in No.26 above, why?
   (a) It was not important ☐
   (b) Doctor had explained ☐
   (c) I feared asking ☐
   (d) Others, specify ...............................................................................

28. Have you ever taken an X-ray and then it was repeated?
   Yes ☐  No ☐

29. If yes in No.28 above, did you ask why it had to be repeated?
   Yes ☐  No ☐

30. If no in No.29 above, why?
   (a) It was not important ☐
   (b) Doctor had explained ☐
   (c) I feared asking ☐
   (d) Others, specify ...............................................................................

31. If yes in No.29 above, were you satisfied with the explanation?
   Yes ☐  No ☐

32. If no in No.31 above, what did you do?
   Specify ........................................................................................................

33. For the last one year, approximately how many X-rays have you taken in total?
   Specify ........................................................................................................

Thank you for your participation.