Evaluation of knowledge and observance of protection and performance of radiologists in medical imaging centers of Zabol hospitals

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Abstract
Background: Ionizing radiation is dangerous for patients and radiologists working in radiology departments but is effective in diagnosing diseases, so knowledge, familiarity and application of protection and proper technical practice in the useful use of radiation can be important. The performance of radiologists is one of the principles of radiation protection in medical imaging centers of Zabol hospitals.

Material and Methods: In this study, all radiologists in the radiology department of Zabol hospitals who were working have been evaluated. In this descriptive-analytical study, a checklist whose reliability and validity was confirmed and including 29 questions in both technical and protective areas was used to collect information about personnel protection and technique. The results were analyzed using SPSS software.

Results: All radiographic personnel in this study, of which 42.10% were male and 57.89% were female, whose performance score was evaluated, had a mean technical score of 14.21 ± 1.84 and a protective score of 9 ± 1.78. The results of six factors of radiology staff including the results of the five factors of radiology staff including gender, employment status, age, work experience, number of shifts and Education evaluated That were not significant.

Conclusions: The results of this study showed that the level of technical and protective performance of radiologists was acceptable. To raise the awareness of radiation workers, it is better to hold a retraining course related to radiation protection.

Keywords: Radiographs, Radiation Protection, Radiography Techniques.

Introduction
One of the most important parts of the hospital is the radiology department that helps clinicians to recognize diseases. The basis of radiography is to create an appropriate diagnostic image and protect the patient against radiation.

Increasing use of X-ray imaging is the most common medical diagnostic method and critical decisions are made by radiography imaging. Unlike the benefits that these radiations have in medicine, the highest source of artificial radiation is also (1-5). Due to the fact that the effects of ionizing radiation in the future are determined, they must be used with caution and observance of the ALARA law to minimize unnecessary radiation to the patient and personnel (6, 7). This responsibility is in the first stage is taken by radiology staff. A wide range of factors in radiography is under the control of the staff of the radiology department, while preserving the diagnostic value of the image, the patient's radiation can be minimized (8, 9).

The World Health Organization has developed guidelines for improving and protecting radiographs and has recommended that guidelines be followed. Excessive exposure can remain on genes, hematopoietic cells, and central nerves can leave on gene, hematopoietic cells, central nerves (10-13), and the whole body of serious negative effects (14).

By identifying the factors that unnecessarily increase the uptake of Pretora and then planning in radiography, they lead to a decrease in radiation absorption in individuals (15, 16); therefore, awareness, familiarity and application of
these guidelines by radiation workers can play a role an important part in the protection of radiation. If these people do not have the knowledge they need, then their health behavior is not right and may be harmful to themselves or to people who have to use radiation to diagnose or treat illness. Therefore, the awareness of these people is necessary and necessary, which guarantees the proper functioning of these employees. Examining research in this area, such as: Almen et al (2000) (17) and Muhogora et al. (2001) (18), also suggest that improving the quality of radiographic images requires knowledge of this manual and radiography. Is the basis. In this regard, Krutz (2000), Gogos (2003), Ononugbo (2017) and Almalki (2017) have done research. The results of both studies have shown that the training of technical and protective principles has improved the performance of radiographers in the imaging (19-22). Other research (Alipour, Davoudian, Tohidi, Borhani and Mohammad Alizadeh) has shown that radiologists need training and retraining workshops to increase their knowledge and awareness. (23-26). This study will be Evaluation of knowledge and observance of protection and performance of radiologists in medical imaging centers of Zabol hospitals. The statistical population of the study includes all staff working in radiographic centers of Zabol hospitals who will participate in this study.

According to the evaluation of technical and protective performance scores, the need for planning to increase the level of knowledge and knowledge of radiologists should be planned and proposed.

Material and Methods
In this study, all of 19 radiologists in the radiology department of Zabol hospitals who were working have been evaluated. In this descriptive-analytical study, a checklist whose reliability and validity was confirmed and including 29 questions in both technical and protective areas was used to collect information about personnel protection and technique. The results were analyzed using SPSS software.

For the evaluation of radiologists, a checklist was used which included 29 questions in the two areas of technical performance and protective performance. In this checklist, each performance was scored with zero or one point based on its performance. The total technical performance score was between zero and seventeen and the protective performance was between zero and twelve. The accuracy of this checklist has been verified by experts

Validation checklist
The questionnaire was completed by ten radiologist. The questionnaire was filled again unchanged after a month with the participation of the same 10 members of the paratroop and then analyzed by the relevant consultant and the alpha Cronbach has achieved 79%, which is confirmed in terms of reliability. The content validity of the Awareness Questionnaire was verified by three faculty members.

Get ethical approval
Since the checklists lack the names and personal information of individuals, there is no ethical prohibition. The names of the radiology staff involved in the confidentiality plan and Their participation in the study was completely voluntary and free, so a code of ethics was undertaken to carry out the research.

Data collection
The items in the checklist were viewed and recorded by a radiologist, in three different shifts. In order to measure the level of awareness of the workers' protective and technical principles, a questionnaire of 12 questions was developed in two areas and completed by the staff. Each questionnaire, if the answer was correct, scored one, and if the answer was incorrect, the score was zero; the total score of knowledge was between zero and 12 variables.

statistic analysis
The results were analyzed using SPSS software.

Results
Technical and protective mean score
A total of personnel contributed to this study. mean score in the technical area was 14.21 ± 1.84, and protective area was 9 ± 1.78.
The highest and lowest percentages of correct response in protect were 94.7 % and 31.6%, respectively, and in techniques 100% and 36.8 %, respectively.

Evaluation of technical and protective mean score according to 5 factors
A total of 35 personnel in the study 42.10% were male and 57.89% were female The results of the five factors of radiology staff including gender, employment status, age, work experience and Education are listed in two tables.

Table 1: The technical and protective performance scores (Mean and standard deviation) of radiologists for factors of gender, employment status and education based on the t-test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Demographic characteristics</th>
<th>Average technique</th>
<th>Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>zahedan</td>
<td>zabol</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Average= Standard deviation</td>
<td></td>
<td>zahedan</td>
</tr>
<tr>
<td></td>
<td>zahedan</td>
<td>zabol</td>
<td></td>
</tr>
</tbody>
</table>


Table 2: The technical and protective performance scores of radiologists for factors of age and background of staff based on the correlation test

<table>
<thead>
<tr>
<th>Variable</th>
<th>The degree of technical relation</th>
<th>Degree of protection relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Zahedan</td>
<td>Zabol</td>
</tr>
<tr>
<td>Age</td>
<td>0.02</td>
<td>-0.15</td>
</tr>
<tr>
<td>Work experience</td>
<td>-0.042</td>
<td>-0.13</td>
</tr>
<tr>
<td>Number of shifts</td>
<td>-0.299*</td>
<td>-0.19</td>
</tr>
</tbody>
</table>

**Discussion**

The results of this study, which were conducted to determine the knowledge and practice of personnel working in Zabol's radiology departments regarding protective and technical principles, indicate high level of knowledge of personnel in two areas of study.

Staff of radiology departments have a mean age of about 31.78 years. The mean working experience of personnel was 8.46 years.

The technical and protective performance scores of radiologists for factor of age education, but the effect of the factors was not significant with scores (Table 1); however, in the protective area, the performance of men and in the technical field of female performance was better than Tavakoli's research and Tohidi's research (26, 27).

The results showed no significant difference between design and non-design forces (Table 1), and all employees had a satisfactory performance.

Comparing the technical and protective performance by distinguishing a degree, it shows the Associate Degree and Bachelor's association was not found between them (Table 1), which is based on their knowledge and information. This is also discussed in other studies (23, 24) Lower average to correct answers for low degree is the cause of low level of university educations (27).

The technical and protective performance scores of radiologists for factors of age and background of staff based on the correlation test was not significant only (Table 2), however the experience and experience of these personnel Which is consistent with Rahimi's research and Tohidi's research (26, 28).

The present study had other findings, including higher technical performance and personnel protection among those who had less working shifts; the inverse association between the number of shifts and the efficiency of staff (26)

**Conclusions**

Increasing use of X-ray imaging is the most common medical diagnostic method and critical decisions are made by radiography imaging.

By identifying the factors that unnecessarily increase the uptake of Pretora and then following the protective instructions and applying the appropriate technical function in radiography, it is possible to reduce the absorption of radiation and make a better diagnosis in people.

The results of this study showed that the level of technical and protective performance of radiologists was acceptable. To raise the awareness of radiation workers, it is better to hold a retraining course related to radiation protection.

**Acknowledgments**

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**Footnotes**

**Conflict of Interests:** The authors declare no conflict of interests.

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