

Deanship of graduate studies

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**Assessment of Radiological Examinations Hazards'
Knowledge among Palestinian Physicians at Al-Makassed
Hospital and Ramallah Governmental Hospital**

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Hospital and Ramallah Governmental Hospital**

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Thesis Approval

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Dedication

This thesis is dedicated to my parents, my wife and my children Majd, Dana, Mohammad and Abed Al-Rahman with love and gratitude.

Declaration

No portion of the work referred to in this study has been submitted in support of an application for any other degree or qualification to this or any other university or other institution of learning.

Signature:.....

Ahmad Fathi Hamarsheh

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Abstract

The current study is designed to assess the knowledge about radiation doses and possible risks associated with the use of radiological examinations among Palestinian physicians. A cross-sectional design was utilized to achieve this purpose. The data for the research was gathered using a self-reported questionnaire distributed by the researcher to 167 physicians working at Al-Makassed Hospital in East Jerusalem and Ramallah Governmental Hospital in the West Bank. A total of 163 questionnaires were returned, for a very high final response rate of 97.6%.

Statistical analysis was performed using the Statistical Package for Social Science (SPSS), Version 15. Descriptive statistics and the chi-squared and Fisher exact tests were used to analyze the data.

The results of the current study reveal that, in general, there is a lack of knowledge regarding the radiation hazards associated with the use of radiological examinations, a level of knowledge lower than those reported in the literature from other studies. Only one-third of the physicians have received a radiation protection course during their undergraduate study or at the workplace. This result may be reflected in the low percentages of physicians who were able to answer correctly many scientific, knowledge-based questions. For example, only 6.1% of the respondents were able to identify the ALARA principle, although this principle comprises the core of radiation protection philosophy regarding the minimizing of radiation doses from radiological examinations. Also, the vast majority of respondents (98.2%) did not know that patients have no established safe dose limit according to ICRP recommendations. In addition, only 5.3% of participants were able to identify the chest X-ray equivalent of effective dose resulting from a routine lumbar spine X-ray examination, a barium enema, and an abdominal and pelvic CT scan. On average, about 20% of respondents knew the relative radio-sensitivity of five specified body organs—the lungs, stomach, gonads, bladder and kidneys—in relation to each other.

Only 32% of respondents indicated that radiological examinations should be clinically justified, and that responsibility for protecting the patient from unnecessary radiation doses lies with *both* the prescriber and the practitioner. More than two-thirds of the respondents indicated that they request routine X-ray examinations more than 25% of the time, and 58.3% reported that they request CT scan examinations more than 25% of the time. In general, the physicians who were medically trained in Arab countries reported that they requested these examinations with high frequency.

On the other hand, more than two-thirds of respondents reported that they would reduce their ordering of radiological examinations (routine x-ray, fluoroscopic, and CT scan examinations) if there is a proven increase in patients' lifetime risks of cancer from any of these examinations.

These results clearly indicate the need for greater efforts to educate physicians about the potential hazards associated with the use of radiological examinations. This in turn may help reduce the exposure of Palestinian patients to the potentially harmful effects of ionizing radiation produced by unnecessary radiological examinations.

ملخص الدراسة

تم وضع هذه الدراسة من أجل تقييم معرفة الأطباء الفلسطينيين بجرعات الأشعة الناتجة عن الفحوصات الشعاعية الطبية، وما قد ينجم عنها من مخاطر. استخدمت دراسة كمية مقطعية من أجل تحقيق هذا الهدف. جمعت المعلومات اللازمة للدراسة بواسطة استبانات. قام الباحث بتوزيع هذه الاستبانات بنفسه على 167 طبيب من العاملين في مستشفى المقاصد في القدس الشرقية ومستشفى رام الله الحكومي في الضفة الغربية. تم إرجاع ما مجموعه 163 استبانة، مُشكّلة بذلك نسبة مشاركة عالية بلغت 97.6%.

أُستخدِمَ برنامج الرزم الإحصائية للعلوم الاجتماعية (SPSS) لتحليل العينة، حيث استعملت النسخة 15 من هذا البرنامج. كذلك استخدم التحليل الوصفي، بالإضافة إلى الكاي مربع (X^2) وفسر المضبوط (Fisher exact test) لتحليل المعلومات.

تظهر نتائج هذه الدراسة نقص في معرفة الأطباء بالمخاطر المصاحبة لاستعمال الفحوصات الشعاعية، وأن مستوى هذه المعرفة هو أقل مما هو عليه الحال في الدراسات الأخرى، والتي تم الإطلاع عليها من خلال أدبيات الدراسة. فقط ثلث الأطباء الذين أجريت عليهم الدراسة التحقوا بفصول لتعليم الحماية من الأشعة، سواء في مكان العمل أو أثناء الدراسة. هذه النسبة المنخفضة انعكست في إجابات الأطباء بما يتعلق بمعرفتهم بأصول الحماية من الأشعة. على سبيل المثال، فقط 6% من المشاركين في الدراسة أبدوا معرفتهم بالـ (ALARA)، التي تتضمن تقليل جرعات الأشعة التي يتعرض لها المريض إلى أقل ما يمكن أثناء عمل الفحوصات الشعاعية. هذا مع العلم بأن هذا المبدأ يمثل جوهر فلسفة الحماية من الأشعة. كما أن الأغلبية الساحقة من المستجيبين (98.2%) لم يعرفوا أن المريض لم يوضع له حد معين للتعرض للأشعة من قِبَل الـ (ICRP). بالإضافة إلى أن 5.3% فقط من المشاركين في الدراسة كانوا قادرين على تحديد صور الصدر المكافئة لجرعات الأشعة الفعلية (Effective Doses) الناجمة عن كل من فحص الأشعة الروتيني للعمود الفقري السفلي، والفحص الملون للأمعاء الغليظة والفحص الطبقي المحوري للطن. ما يقارب 20% من المستجيبين استطاعوا تحديد الحساسية من الأشعة لكل من الرنتين، والمعدة، والغدد التناسلية، والمثانة والكلى نسبة إلى الأعضاء الأخرى.

فقط 32% من المستجيبين أشاروا إلى أن الفحوصات الشعاعية يجب أن يتم تبريرها، وأن من يقوم بطلب الفحوصات الشعاعية ومن يعملها تقع على عاتقه مسؤولية حماية المريض من جرعات الأشعة غير الضرورية. أكثر من ثلثي المستجيبين أشاروا بأنهم يطلبون الفحوصات الشعاعية الروتينية لأكثر من 25% من الحالات المرضية، كما أن 58.3% ذكروا بأنهم يطلبون الفحوصات الطبقيّة المحورية لأكثر من 25% من الحالات المرضية. بوجه عام الأطباء الذين تلقوا علومهم الطبية في البلدان العربية أشاروا بأنهم يطلبون الفحوصات الشعاعية بنسبه عالية.

من جهة أخرى، أبدى أكثر من ثلثي الأطباء المشاركين استعدادهم لتقليل طلباتهم من الفحوصات الشعاعية (الفحوصات الروتينية، والفحوصات الملونة، والفحوصات الطبقيّة المحورية) إذا كان هناك ما يدل على احتمالية حدوث أورام سرطانية بسبب أي من هذه الفحوصات.

هذه النتائج تشير بشكل جلي إلى الحاجة إلى بذل المزيد من الجهد لزيادة معرفة الأطباء بالأخطار التي قد تنتج عن استعمال الفحوصات الشعاعية. هذا قد يساعد في تخفيف الأضرار التي تنتج عن تعرض المرضى الفلسطينيين إلى الأشعة الناجمة عن الفحوصات الشعاعية الغير ضرورية.

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