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*Original Article*

# Perception of Physicians' Knowledge Regarding Guidelines and Clinical Practice in Prescribing Diagnostic Imaging Exams at a Hospital in Luanda, Angola

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**Abstract:** This study aimed to assess physicians' perceptions of their knowledge of guidelines and clinical practice in prescribing imaging exams. A cross-sectional study was conducted from October to December 2025 at the Military Hospital in Luanda, Angola. Data were collected through an online questionnaire, the link to which was shared in several WhatsApp groups of physicians. The chi-square or Fisher's exact test, univariate and multivariate logistic regression analyses were used. A p-value <0.05 was considered significant. A total of 109 physicians participated in the study, 53.2% were women, with a mean age of 35.8±7.7 years and 78.0% were resident physicians. Of those, 51.4% had never heard of the guidelines, and 60.6% had inadequate knowledge regarding questions about the exams that use ionizing radiation. Specifically, 33.9% and 19.3% incorrectly stating that computed tomography and radiography, respectively, do not use ionizing radiation, and 34.9% incorrectly stating that magnetic resonance imaging does use it, without significant differences between being a specialist or resident, or having specific training in prescribing imaging exams or in radiation protection. A major investment in training and awareness among physicians is necessary to avoid the indiscriminate and incorrect use of imaging exams, service overload, and increased healthcare costs.

**Keywords:** Perception of Knowledge; Guidelines; Imaging Exams; Angolan Physicians.

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## 1. Introduction

The use of imaging exams in current clinical practice is essential for diagnostic definition and early and assertive treatment decisions. However, inappropriate requests for these exams are a growing concern due to excessive use, unnecessary exposure to ionizing radiation, delays in diagnosis, and increased healthcare costs [1]. Despite technological advances with modern equipment that includes advanced dose reduction technologies, interactive reconstruction algorithms, and automated exposure control systems, which allow for optimal image quality with lower doses [2–4], the risks of radiation from exams that use high doses of ionizing radiation, such as computed tomography (CT), are significant. The lifetime cancer risk resulting from an abdominal or pelvic CT scan is estimated to be 1 in 2,000 in adults, with the potential for a cumulative effect after multiple scans [5].

Several factors contribute to the inappropriate ordering of imaging exams, such as clinical uncertainty, time pressure, patient expectations regarding diagnosis, legal concerns, and physicians' unknowledge of or no adherence to specific guidelines [6,7]. Imaging protocols and clinical guidelines are practical and useful tools to guide physicians in the appropriate selection of imaging exams based on patients' clinical indications. Some countries, especially those with limited resources, do not have or have limited access to these decision support tools when requesting imaging exams [8], mainly due to a lack of qualified human resources and the absence of computerized support systems [9].

Familiarity with imaging protocols and clinical guidelines contributes to more informed, efficient prescribing that is aligned with good medical practice [10,11]. Studies have shown that the use of these guidelines significantly improves the quality of medical prescriptions, contributing to a reduction in unnecessary exposure to ionizing radiation, optimization of resources, and increased diagnostic effectiveness [12]. When implemented, guidelines contribute not only to the standardization of clinical practice, but also to the strengthening of evidence-based medicine, promoting safer and more cost-effective care. This reinforces its applicability in countries with limited resources such as Angola, a country in Sub-Saharan Africa.

The Military Hospital in Luanda, Angolan capital, is a tertiary healthcare facility providing emergency, inpatient, and outpatient care to adult patients in several medical and surgical specialties. The main diagnostic imaging exams performed are radiography (X-ray), computed tomography (CT scan), ultrasound (US), and magnetic resonance imaging (MRI), and we are currently facing an excessive increase in requests for these exams. Therefore, the objective of this study was to evaluate physicians' perception of knowledge about guidelines and clinical practice in prescribing imaging exams.

## 2. Methodology

### 2.1 Study design, study area, and population

It was a cross-sectional study conducted from October to December 2025 at the Military Hospital in Luanda, a tertiary-level hospital with 280 beds and 477 physicians (197 specialists and 280 residents) at the time of the study. All physicians were invited to participate in the study, and the sample was non-probabilistic for convenience. The inclusion criteria were being a non-radiologist physician and being fully active in the hospital. The sample size was calculated using the OpenEpi program [13]. Based on the number of physicians working at the hospital (N= 477), with a margin of error not exceeding 5% and a confidence interval of 95%, the minimum estimated sample size was 214 participants.

### 2.2 Data collection

The data were collected using an online Google Docs questionnaire (https://docs.google.com), developed by the authors based on international guidelines for prescribing imaging exams, the American College of Radiology (ACR) Appropriateness Criteria [14], and following the Checklist for Reporting Results of Online Surveys (CHERRIES guidelines) [15]. The online link was shared in several WhatsApp groups for physicians at the hospital, who were thus invited to participate. The questionnaire contained a brief introduction, the purpose of the study, the inclusion criteria, and the voluntary nature of participation, as well as a guarantee of anonymity and confidentiality. It was designed to prevent incomplete forms from being submitted, so there was no missing data.

The first part of the questionnaire related to the general characteristics of the participants, such as gender, age and professional category, followed by questions about their knowledge of the existence of guidelines; clinical practice in prescribing imaging exams; and questions about which exams (X-ray, CT scan, US, and MRI) use ionizing radiation. Regarding the last question, we considered the correct answer when the physician responded that X-ray and CT scan use ionizing radiation and MRI and US do not.

Physicians who correctly marked all four options were considered to have adequate knowledge.

### 2.3 Statistical analysis

The data were analyzed using the statistical program SPSS (Statistical Package for the Social Sciences) version 29. Categorical variables were described in absolute and relative frequencies, and continuous variables in means and standard deviation. The chi-square test or Fisher's exact test (whenever appropriate) were used to analyze the association between categorical variables. All associations between each of the variables of interest were established using logistic regression, which estimated the respective odds ratios (OR). An adjusted version of these ORs was also estimated, considering potential confounding factors. Statistical significance was defined as a p-value < 0.05.

## 3. Results

Of a total of 450 eligible physicians working at the hospital during the study period, only 109 (24.2%) responded to the questionnaire, with a mean age of 35.83±7.72, most of whom were women (53.2%) and resident physicians (78.0%). Thirty-three physicians (30.3%) responded that they prescribed imaging exams daily, and 35.8% responded that they prescribed them two to three times per week. Nineteen (17.4%) physicians had training on prescribing imaging exams, and 9.2% had training on protection against ionizing radiation (Table 1).

Regarding knowledge of the existence of guidelines for prescribing imaging exams and prescribing practices, 51.4% of physicians had never heard of the guidelines, 56.9% were unfamiliar with the ACR criteria, and 34.9% had already ordered imaging exams without examining the patient. On the other hand, we also asked physicians how they themselves assessed their knowledge of the risks associated with exposure to ionizing radiation. On a scale of one to three, 32.1% responded that their knowledge was high, 44.0% was medium, and 23.9% was low. We found no significant differences between these variables and the gender, nor with the professional category (Table 2).

**Table 1.** General characteristics of the participants (n=109).

| Variable | N (%) |
|---|---|
| Gender | |
| Female | 58 (53.2) |
| Male | 51 (46.8) |
| Age (years) | |
| Mean ± SD | 35.83 ± 7.72 |
| Median (Min;Max) | 34.0 (27; 64) |
| Age range (years) | |
| ≤ 30 | 28 (25.7) |
| 31 - 40 | 62 (56.9) |
| > 40 | 19 (17.4) |
| Professional category | |
| Specialist | 24 (22.0) |
| Resident | 85 (78.0) |
| Frequency of prescription of imaging exams | |
| Daily | 33 (30.3) |
| 2 – 3 times a week | 39 (35.8) |
| Once a week | 19 (17.4) |

| | |
|---|---|
| Rarely | 18 (16.5) |
| Specific training on prescribing imaging exams | |
| Yes | 19 (17.4) |
| No | 90 (82.6) |
| Specific training on protection against ionizing radiation | |
| Yes | 10 (9.2) |
| No | 99 (90.8) |

SD: Standard Derivation; Min: Minimum; Max: Maximum.

**Table 2.** Knowledge of guidelines and clinical practice among physicians.

| Questions | Total | Female | Male | p-value | Specialist | Resident | p-value |
|---|---|---|---|---|---|---|---|
| | N (%) | 58 (53.2) | 51 (46.8) | | 24 (22.0) | 85 (78.0) | |
| **Have you heard of the clinical guidelines for prescribing imaging exams?** | | | | | | | |
| Yes | 53 (48.6) | 30 (51.7) | 23 (45.1) | 0.490 | 15 (62.5) | 38 (44.7) | 0.124 |
| No | 56 (51.4) | 28 (48.3) | 28 (54.9) | | 9 (37.5) | 47 (55.3) | |
| **Are you familiar with the American College of Radiology (ACR) appropriateness criteria?** | | | | | | | |
| Yes | 3 (2.8) | 1 (1.7) | 2 (3.9) | 0.631 | 2 (8.3) | 1 (1.2) | 0.066 |
| Heard about it | 44 (40.4) | 22 (37.9) | 22 (43.1) | | 12 (50.0) | 32 (37.6) | |
| No | 62 (56.9) | 35 (60.3) | 27 (52.9) | | 10 (41.7) | 52 (61.2) | |
| **Have you ever prescribed imaging exams without performing physical examination?** | | | | | | | |
| Yes | 38 (34.9) | 20 (34.5) | 18 (35.3) | 0.929 | 7 (29.2) | 31 (36.5) | 0.507 |
| No | 71 (65.1) | 38 (65.5) | 33 (64.7) | | 17 (70.8) | 54 (63.5) | |
| **Have you received specific training on prescribing imaging exams?** | | | | | | | |
| Yes | 19 (17.4) | 7 (12.1) | 12 (23.5) | 0.116 | 7 (29.2) | 12 (14.1) | 0.086 |
| No | 90 (82.6) | 51 (87.9) | 39 (76.5) | | 17 (70.8) | 73 (85.9) | |
| **Have you received specific training on protection against ionizing radiation?** | | | | | | | |
| Yes | 10 (9.2) | 8 (13.8) | 2 (3.9) | 0.075 | 1 (4.2) | 9 (10.6) | 0.336 |
| No | 99 (90.8) | 50 (86.2) | 49 (96.1) | | 23 (95.8) | 76 (89.4) | |
| **On a scale of one to three, how would you rate your knowledge about the risks associated with exposure to ionizing radiation?** | | | | | | | |
| High | 35 (32.1) | 18 (31.0) | 17 (33.3) | 0.616 | 12 (50.0) | 23 (27.1) | 0.104 |
| Medium | 48 (44.0) | 24 (41.4) | 24 (47.1) | | 8 (33.3) | 40 (47.1) | |
| Low | 26 (23.9) | 16 (27.6) | 10 (19.6) | | 4 (16.7) | 22 (25.9) | |

Concerning the use of imaging exams in the hospital, 38.5% of physicians agreed that exams are prescribed rationally, 77.1% agreed that they are prepared to prescribe imaging exams rationally, and 86.2% agreed that excessive requests for imaging exams compromise the efficiency of diagnostic imaging services. We also found no significant differences between these variables and the gender or professional category (Table 3).

About the questions which exams, namely X-ray, CT scan, US, and MRI, use ionizing radiation, only 43 (39.4%) physicians had adequate knowledge, since 33.9% and 19.3% of physicians stated that CT scan and X-ray, respectively, do not use ionizing radiation, and 34.9% and 0.9% stated that MRI and US, respectively, use ionizing radiation, again with no significant differences between gender, age, being a specialist or resident, or having specific training. However, the perception of having medium knowledge about the risks associated with exposure to ionizing radiation was significantly associated with

adequate knowledge by more than five times [AOR 5.38 (95% CI: 1.60-17.99) p=0.006] (Table 4).

**Table 3.** Physicians' perception of the use of imaging exams in the hospital.

| Questions | | Gender | | | Professional category | | |
|---|---|---|---|---|---|---|---|
| | **Total** | **Female** | **Male** | **p-value** | **Specialist** | **Resident** | **p-value** |
| | **N (%)** | **58 (53.2)** | **51 (46.8)** | | **24 (22.0)** | **85 (78.0)** | |
| The prescription of imaging exams at the hospital is done carefully? | | | | | | | |
| Completely agree | 7 (6.4) | 4 (6.9) | 3 (5.9) | 0.490 | 3 (12.5) | 4 (4.7) | 0.330 |
| Agree | 35 (32.1) | 16 (27.6) | 19 (37.3) | | 9 (37.5) | 26 (30.6) | |
| Neutral | 23 (21.1) | 11 (19.0) | 12 (23.5) | | 2 (8.3) | 21 (24.7) | |
| Disagree | 37 (33.9) | 24 (41.4) | 13 (25.5) | | 8 (33.3) | 29 (34.1) | |
| Completely disagree | 7 (6.4) | 3 (5.2) | 4 (7.8) | | 2 (8.3) | 5 (5.9) | |
| I feel prepared to prescribe imaging exams in a rational manner. | | | | | | | |
| Completely agree | 29 (26.6) | 13 (22.4) | 16 (31.4) | 0.574 | 9 (37.5) | 20 (23.5) | 0.174 |
| Agree | 55 (50.5) | 29 (50.0) | 26 (51.0) | | 10 (41.7) | 45 (52.9) | |
| Neutral | 14 (12.8) | 9 (15.5) | 5 (9.8) | | 1 (4.2) | 13 (15.3) | |
| Disagree | 11 (10.1) | 7 (12.1) | 4 (7.8) | | 4 (16.7) | 7 (8.2) | |
| Completely disagree | 0 (0.0) | 0 (0.0) | 0 (0.0) | | 0 (0.0) | 0 (0.0) | |
| The excessive use of imaging exams compromises the efficiency of diagnostic imaging services? | | | | | | | |
| Completely agree | 36 (33.0) | 21 (36.2) | 15 (29.4) | 0.451 | 8 (33.3) | 28 (32.9) | 0.343 |
| Agree | 58 (53.2) | 27 (46.6) | 31 (60.8) | | 15 (62.5) | 43 (50.6) | |
| Neutral | 10 (9.2) | 7 (12.1) | 3 (5.9) | | 0 (0.0) | 10 (11.8) | |
| Disagree | 5 (4.6) | 3 (5.2) | 2 (3.9) | | 1 (4.2) | 4 (4.7) | |
| Completely disagree | 0 (0.0) | 0 (0.0) | 0 (0.0) | | 0 (0.0) | 0 (0.0) | |

## 4. Discussion

This was a cross-sectional study conducted at a tertiary hospital in Luanda, the capital of Angola, where the main objective was to assess physicians' perception of knowledge about guidelines and clinical practice in prescribing imaging exams. Most of the physicians who responded to the questionnaire were women, resident, and prescribed imaging exams daily or two to three times a week. Almost all stated that they had no specific training in prescribing imaging exams or in protection against ionizing radiation. More than half of physicians are unaware of the guidelines for prescribing exams and do not consult them. A worrying finding from our study was that more than half of the physicians did not have adequate knowledge about imaging exams that use ionizing radiation, regardless of gender, age, whether they were specialists or residents, or whether they had undergone specific training. For countries where health resources are limited and there are no national guidelines, such as Angola, the adoption of guidelines already developed in other countries has been recommended, although there are numerous challenges in their applicability [16].

**Table 4.** Logistic regression analysis to identify the factors associated with the knowledge regarding which imaging exams use ionizing radiation (X-ray, CT scan, US, and MRI).

| Variable | Total N (%) | Yes 43 (39.4) | No 66 (60.6) | OR (95% CI) | p-value | AOR (95% CI) | p-value |
|---|---|---|---|---|---|---|---|
| **Gender** | | | | | | | |
| Female | 58 (53.2) | 22 (51.2) | 36 (54.5) | 1 | | 1 | |
| Male | 51 (46.8) | 21 (48.8) | 30 (45.5) | 0.87 (0.40–1.89) | 0.729 | 0.91 (0.38–2.21) | 0.836 |
| **Age (years)** | | | | | | | |
| Mean ± SD | 35.83 ± 7.72 | 35.33 ± 5.44 | 36.17 ± 8.93 | 0.99 (0.94–1.04) | 0.578 | 1.02 (0.90–1.15) | 0.786 |
| **Age range (years)** | | | | | | | |
| ≤ 30 | 28 (25.7) | 8 (18.6) | 20 (30.3) | 1 | | 1 | |
| 31–40 | 62 (56.9) | 30 (69.8) | 32 (48.5) | 2.34 (0.90–6.12) | 0.082 | 2.09 (0.61–7.21) | 0.241 |
| > 40 | 19 (17.4) | 5 (11.6) | 14 (21.2) | 0.89 (0.24–3.31) | 0.865 | 1.69 (0.09–32.61) | 0.727 |
| **Professional category** | | | | | | | |
| Specialist | 24 (22.0) | 6 (14.0) | 18 (27.3) | 1 | | 1 | |
| Resident | 85 (78.0) | 37 (86.0) | 48 (72.7) | 2.31 (0.84–6.40) | 0.107 | 3.27 (0.64–16.84) | 0.157 |
| **Specific training in prescribing imaging exams** | | | | | | | |
| Yes | 19 (17.4) | 7 (16.3) | 12 (18.2) | 0.88 (0.32–2.43) | 0.798 | 1.50 (0.46–4.87) | 0.498 |
| No | 90 (82.6) | 36 (83.7) | 54 (81.8) | 1 | | 1 | |
| **Specific training on protection against ionizing radiation** | | | | | | | |
| Yes | 10 (9.2) | 6 (14.0) | 4 (6.1) | 2.51 (0.67–9.50) | 0.174 | 3.23 (0.72–14.4) | 0.125 |
| No | 99 (90.8) | 37 (86.0) | 62 (93.9) | 1 | | 1 | |
| **Perception of knowledge about the risks associated with exposure to ionizing radiation** | | | | | | | |
| High | 35 (32.1) | 12 (27.9) | 23 (34.8) | 2.19 (0.66–7.27) | 0.200 | 2.67 (0.72–9.90) | 0.142 |
| Medium | 48 (44.0) | 26 (60.5) | 22 (33.3) | 4.96 (1.61–15.34) | 0.005 | 5.38 (1.60–17.99) | 0.006 |
| Low | 26 (23.9) | 5 (11.6) | 21 (31.8) | 1 | | 1 | |

Adjusted OR by gender, age and professional category. SD: standard derivation; OR: odds ratio; CI: confidence interval; AOR: adjusted odds ratio; Note: Data in bold indicates significant association.

More than half of the participants in our study (51.4%) were unaware of the existence of guidelines for prescribing imaging exams. Similar results have been found in other studies [17,10], and the reasons described worldwide are the absence of national guidelines and the adoption, dissemination, and applicability of international guidelines [17], which may also justify our results. Although few physicians were familiar with the guidelines for prescribing imaging exams, 77.1% agreed that they were prepared to prescribe exams rationally, and 86.2% recognized that excessive requests for imaging exams

overload services, contributing to reduced service efficiency and increased healthcare costs, as described by other authors [18].

Global evidence highlights that the knowledge acquired by medical students and physicians about important concepts of ionizing radiation is inadequate [19,20]. This has been demonstrated in several studies conducted in medical schools, emergency departments, and wards. According to the results of some studies, knowledge has been insufficient among medical students and newly graduated physicians, although an improvement in knowledge has been observed with increased experience [10,21]. In the study conducted in Scotland, the physicians who obtained the highest knowledge scores were the specialists [22]. The results of our study showed that more than half (60.6%) of physicians had inadequate knowledge, as they were unable to identify which imaging exams use ionizing radiation and which do not. We highlight the fact that 33.9% stated that CT scan does not use ionizing radiation and 34.9% that MRI uses ionizing radiation. This result was not associated with age, physician category, or even with those who reported having specific training on prescribing imaging exams or on protection against ionizing radiation, as reported in the study conducted in Cameroon [17]. However, in the Cameroon study [17], about 80% of participants responded that MRI uses ionizing radiation, a result much higher than what we found.

The fact that 77.1% of physicians stated that they were prepared to prescribe exams rationally, yet 60.6% were unable to identify which exams use ionizing radiation, is intriguing, but unfortunately evident in the daily practice of prescribing imaging exams at our hospital. We repeatedly encounter prescriptions that violate best practices for the use of imaging exams, which raise concerns about the consequences for patients, first and foremost, for professionals (occupational exposure), and for health services, due to increased workloads, slower response times, and higher costs. On the other hand, this result leads us to believe that physicians are unaware of their own limitations in terms of knowledge about ionizing radiation and therefore claim that they feel prepared to prescribe imaging exams rationally. However, what has been found is that these physicians prescribe exams without being aware of the negative effects of ionizing radiation, which is a cause for concern.

Another worrying finding of this study is that 34.9% of physicians stated that they requested imaging tests without performing a physical examination. Although Angola is a sub-Saharan African country with an estimated population of 36,604,681 [23] and a ratio of 1.8 physicians per 10,000 inhabitants [24], this finding is extremely serious and should be taken very seriously. Perhaps this result is related to the large influx of patients seeking medical assistance in both emergency rooms and outpatient clinics, the uncertainty of physicians in making diagnoses and subsequent treatment, the reduced number of hospital beds, but also the culture of defensive medicine, which is currently often adopted. However, this conduct can lead to the inappropriate prescription of imaging exams, which have other negative consequences also found in our results.

An interesting finding in this study was that physicians' perception of having medium knowledge about the risks associated with exposure to ionizing radiation was significantly associated with adequate knowledge, rather than being specialist physicians or those who had specific training. We believe that the low level of knowledge reveals poor and superficial learning of the subject during medical school, aggravated by the lack or insufficiency of training programs in radiation protection and clinical guidelines for referral for imaging exams after graduation from medical school. In a study conducted in five health facilities in sub-Saharan Africa, the authors concluded that routine continuing medical education programs are a good option for increasing awareness and knowledge levels on issues related to guidelines and radiation protection [25]. Training on this topic in hospitals is also important to empower professionals who may not have received adequate training and to reinforce and update the training of those who have, provided that the most appropriate teaching method is selected [22,26].

Our results reflect the shortcomings in medical physics training during medical school. To our knowledge, the curriculum of medical schools in Angola has an average workload of 192 hours in medical imaging, where the content is summarized, making it insufficient. We also attribute this to the lack or insufficiency of continuing education programs on the subject in health facilities, and other forms of training in this area, which is crucial in clinical practice. The quality of training in Angola has been a cause for concern for government institutions. Thus, in 2024, the National Institute for the Evaluation, Accreditation, and Recognition of Higher Education Studies (INAARES) in Angola released results showing that of the 30 health courses evaluated, only 7 were accredited. This rigorous evaluation process is ongoing and has as its main objective to improve the quality of education in Angola, not only in health courses but at all levels [27]. On the other hand, training, capacity building, and specialization programs have been implemented at the health units level, also with the aim of improving the provision of medical services. Our results are a testament to the fact that urgent and assertive measures must be taken to address these serious gaps in knowledge, which are reflected in clinical practice.

This study has several limitations, including the small sample size, especially among medical specialists; the study was based on the subjective responses/opinions of participants, which may have led to a series of biases; we used a self-developed, unvalidated questionnaire and did not apply any measurement instrument to assess physicians' perception of knowledge. In fact, the small sample size was a major limitation of this study. We followed a schedule that defined a time frame for data collection and noticed early on that there was low participation among physicians. Although we emphasized that the questionnaire was anonymous and encouraged voluntary and conscious participation in responding to the questionnaire during visits to several hospital services, we also held a collective institutional session where we appealed to physicians to participate.

Despite all these actions, it was not possible to obtain the sample size needed to obtain statistically robust results. In our view, we believe that the low participation of physicians may be related to insecurity regarding knowledge of the subject, familiarity or being digitally active on social media, limitations in internet access, as well as a lack of appreciation of the importance of research projects. In spite of the questionnaire has not been validated, it was designed with general and simpler questions taken from internationally validated questionnaires (in accordance with ACR criteria) [14], considering that the medical training program in Angola does not focus sufficiently on teaching most of the topics contained therein, especially with regard to the study of radiation physics, and it would have been much more difficult to get physicians to complete a more complex questionnaire.

Due to the limitations pointed out, our results should be interpreted with caution. Despite these limitations, our study provides useful data on physicians' perceived knowledge regarding clinical practice in prescribing imaging exams. It is one of the few studies conducted in Africa on this topic and the first in Angola. On the other hand, our results reflect physicians' poor knowledge of the subject and the need for strategies to improve academic training in the field of diagnostic imaging, as it is an essential tool in medical practice. A major investment in training, information, and awareness among physicians is necessary to avoid the indiscriminate and incorrect use of imaging exams requests, service overload, and increased healthcare costs at the hospital.

## 6. Conclusion

More than half of the physicians who participated in the study did not have adequate knowledge about imaging exams that use ionizing radiation, regardless of whether they were specialists or residents, nor had they undergone specific training in radiation protection. Urgent action is needed to reformulate and improve medical training programs in Angola concerning medical physics modules. Comprehensive and well-structured clinical audits should be implemented at the hospital level, as well as

continuing education programs with theoretical and practical approaches to the subject as urgently as possible, to improve these indicators. Future studies with a more in-depth approach, validated methodology, and the inclusion of physicians from various hospitals in different provinces of Angola should be conducted to clarify these issues.

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