UTILIZATION OF LEAD APRONS AMONG RADIOLOGIC TECHNOLOGISTS: A BASIS FOR STRENGTHENING RADIATION PROTECTION

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Abstract

This study aimed to determine the utilization of lead aprons among radiologic technologists in private and government hospitals in the City of San Fernando, La Union as a basis for strengthening radiation protection practices. A descriptive-quantitative and comparative research design was employed involving forty-two (42) registered radiologic technologists selected through total enumeration. A validated researcher-made questionnaire was utilized to gather data regarding the demographic profile of respondents and their level of lead apron utilization. Data were analyzed using frequency count, percentage, weighted mean, and one-way analysis of variance (ANOVA). Findings revealed that most respondents were young professionals with limited years of experience and Continuing Education Unit (CEU) participation. The level of utilization of lead aprons was high in both private and government hospitals. However, ANOVA results showed no statistically significant difference in lead apron utilization between hospital types ($p = 0.602$), indicating similar compliance with radiation protection practices regardless of institutional setting. The findings suggest that radiologic technologists consistently adhere to radiation safety protocols influenced by professional training and standardized institutional guidelines. Strengthening continuing education and radiation safety monitoring is recommended to further sustain and improve compliance with lead apron utilization.

Keywords: *Lead apron utilization, Radiologic technologists, radiation protection, occupational safety, diagnostic radiology*

1. Introduction

Radiologic technologists are routinely exposed to ionizing radiation during diagnostic imaging procedures, making radiation protection a critical component of clinical practice. One of the most commonly used protective devices is the lead apron, which significantly reduces exposure to scattered radiation for healthcare workers and patients. Proper utilization of lead aprons is essential in ensuring compliance with radiation safety principles such as ALARA (As Low As Reasonably Achievable).

Despite established international and institutional guidelines on radiation protection, variability in compliance with the use of protective equipment still exists across healthcare settings. Factors such as years of experience, continuing education, and institutional policies may influence adherence to safety practices among radiologic technologists. However, there is limited local evidence regarding the consistency of lead apron utilization in both public and private hospitals in the City of San Fernando, La Union.

Understanding the level of utilization and identifying possible differences between hospital settings are important in strengthening radiation safety programs and improving occupational protection. This study therefore assessed the utilization of lead aprons among radiologic technologists in selected private and government hospitals in the City of San Fernando, La Union. The findings aim to provide baseline data that may help enhance radiation protection practices and support the development of targeted interventions for compliance improvement.

2. Objectives

This study aimed to determine the utilization of lead aprons among radiologic technologists in private and government hospitals in the City of San Fernando, La Union.

3. Materials and Methods

This study used a descriptive-comparative quantitative research design. A total enumeration technique was used, involving all registered radiologic technologists from selected private and government hospitals in the City of San Fernando, La Union (n=42).

Data were gathered using a researcher-made questionnaire divided into two parts: demographic profile and utilization of lead aprons. The instrument was validated by experts in radiology and medical physics and achieved a Cronbach's alpha of 0.79, indicating acceptable reliability.

Data were analyzed using frequency and percentage for demographic profile, weighted mean for level of utilization, and one-way ANOVA to test significant differences between groups. Ethical considerations such as informed consent, confidentiality, and voluntary participation were strictly observed.

4. Results

Table 2 shows that most respondents are aged 20–29 years (42.9%), indicating a predominantly young workforce. The gender distribution is nearly balanced, with slightly more males (52.4%) than females (47.6%). Most are single (54.8%) and BS degree holders (95.2%).

Table 2. Demographic Profiles of Radiologic Technologies

Variables	Frequency (n)	Percentage (%)
Age		
20-29 years old	18	42.9
30-39 years old	11	26.2
40-49 years old	6	14.3
50-59 years old	6	14.3
60 years old and above	1	2.4
total	42	100
Gender		
Male	22	52.4
Female	20	47.6
Total	42	100
Civil status		
Single	23	54.8
Married	18	42.9
Widow	1	2.4
Total	42	100
Highest Educational Attainment		
BS Degree with special attainment	40	95.2
MA Graduate	2	4.8
Total	42	100
Seminars and training relevant to lead apron usage		
0-5 CEU	27	64.3
6-10 CEU	4	9.5
11-15 CEU	8	19.0
16-20 CEU	3	7.1
Total	42	100
Years of Service		
0-5 years	17	40.5
6-10 years	14	33.3
11-15 years	5	11.9
16-20 years	1	2.4
21 years and above	5	11.9
total	42	100

In terms of professional development, most respondents have attended only 0–5 CEUs (64.3%), and a large proportion have 0–5 years of service (40.5%). Overall, the results indicate that most radiologic technologists are early-career professionals with limited experience and continuing education exposure, suggesting that their radiation

protection practices are largely influenced by foundational training and workplace protocols.

Table 3 shows that government hospital respondents obtained a slightly higher mean (3.66) compared to private hospitals (3.60), with an overall mean of 3.63, indicating a high level of lead apron utilization in both settings.

Table 3. Level of Utilization of Lead Aprons Among Radiologic Technologists in terms of private hospital and government hospital.

	N	Mean	Std. Deviation
Private	23	3.60	0.32
Government	19	3.66	0.34
Total	42	3.63	0.33

The standard deviation values show minimal variation, suggesting consistent practices among respondents regardless of hospital type. Overall, the findings indicate that radiologic technologists in both private and government hospitals consistently utilize lead aprons during radiologic procedures, reflecting strong compliance with radiation protection practices.

Table 4 shows an F-value of 0.277 and a p-value of 0.602. Since the p-value is greater than 0.05, there is no significant difference in lead apron utilization between radiologic technologists in private and government hospitals.

Table 4. Significant Difference in the Utilization of Lead Aprons Among Radiologic Technologists in Private and Government Hospitals

	Sum of squares	df	Mean square	F	Sig.
Between groups	.030	1	.030	.277	.602
Within groups	4.333	40	.180		
total	4.363	41			

This indicates that hospital type does not influence compliance, suggesting that radiologic technologists follow similar radiation protection practices regardless of workplace setting.

5. Discussion

The study showed that most radiologic technologists are young professionals aged 20–29 years, with 0–5 years of experience and limited participation in Continuing Education Units (CEUs). This indicates that the workforce is mainly composed of early-career practitioners whose radiation protection practices are likely influenced by foundational education and initial workplace training rather than long-term clinical experience.

Despite this, the utilization of lead aprons was found to be high in both private and government hospitals, suggesting strong awareness and consistent application of

radiation protection practices during radiologic procedures. The slightly higher utilization in government hospitals may reflect stricter monitoring and implementation of safety protocols, although both settings still demonstrate similarly high compliance. The statistical analysis revealed no significant difference in lead apron utilization between private and government hospitals, indicating that hospital type does not influence compliance. This suggests that standardized training, licensure requirements, and radiation safety guidelines contribute more to consistent practice than institutional setting.

Overall, the findings indicate that radiologic technologists across both hospital types consistently adhere to radiation protection measures. However, the limited CEU participation highlights the need to strengthen continuing education and radiation safety training to further enhance and sustain proper lead apron utilization.

6. Conclusion

The study determined the utilization of lead aprons among radiologic technologists in private and government hospitals in the City of San Fernando, La Union. The findings show that most respondents are young, early-career professionals with limited years of experience and low participation in Continuing Education Units (CEUs), indicating that their practices are mainly influenced by foundational training and workplace protocols.

The level of utilization of lead aprons is high in both private and government hospitals, with government hospitals obtaining a slightly higher mean score. This indicates that radiologic technologists consistently practice radiation protection through the use of lead aprons regardless of hospital type.

Furthermore, the study found no significant difference in lead apron utilization between private and government hospitals. This suggests that compliance with radiation protection practices is uniform across both settings and is likely influenced by standardized training, licensure requirements, and institutional safety guidelines rather than hospital classification.

Overall, radiologic technologists demonstrate strong adherence to radiation protection practices; however, continuous professional development is still needed to further strengthen and sustain proper utilization of lead aprons.

7. Acknowledgements

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Gratitude is likewise extended to the panel of examiners—Gryn T. Salagma, RRT, MPH, Godofredo M. Manzano Jr., MAN, and Rogelio S. Quiroga, PhD—for their insightful comments and recommendations that improved this study. Appreciation is also given to the instrument validators for ensuring the validity and reliability of the research instrument.

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9. Appendices

APPENDIX A

Approval Sheet from the Research Ethics Committee

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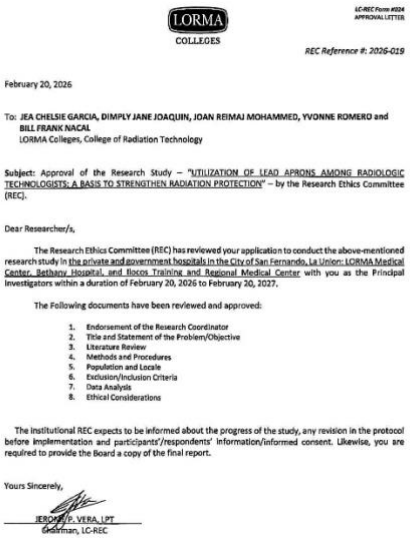

LORMA COLLEGES

LC-REC Form #004
APPROVAL LETTER

REC Reference #: 2026-019

February 20, 2026

To: **JEA CHELSIE GARCIA, DIMPLY JANE JOAQUIN, JOAN REIMAJ MOHAMMED, YVONNE ROMERO and BILL FRANK NACAL**
LORMA Colleges, College of Radiation Technology

Subject: Approval of the Research Study – "UTILIZATION OF LEAD APRONS AMONG RADIOLOGIC TECHNOLOGISTS: A BASIS TO STRENGTHEN RADIATION PROTECTION" – by the Research Ethics Committee (REC).

Dear Researcher/s,

The Research Ethics Committee (REC) has reviewed your application to conduct the above-mentioned research study in the private and government hospitals in the City of San Fernando, La Union: LORMA Medical Center, Bethany Hospital, and Ilocos Training and Regional Medical Center with you as the Principal Investigators within a duration of February 20, 2026 to February 20, 2027.

The Following documents have been reviewed and approved:

1. Endorsement of the Research Coordinator
2. Title and Statement of the Problem/Objective
3. Literature Review
4. Methods and Procedures
5. Population and Locale
6. Exclusion/Inclusion Criteria
7. Data Analysis
8. Ethical Considerations

The institutional REC expects to be informed about the progress of the study, any revision in the protocol before implementation and participants'/respondents' information/informed consent. Likewise, you are required to provide the Board a copy of the final report.

Yours Sincerely,

JEROME P. VERA, LPT
Chairman, LC-REC

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10. Author(s) Biodata

Ms. Jea Chelsie B. Garcia, Ms. Dimple Jane C. Joaquin, Ms. Joan Reimaj L. Mohammed, Mr. Bill Frank R. Nacal, and Ms. Yvonne G. Romero are Bachelor of Science in Radiologic Technology students from Lorma Colleges. Together with their research adviser, Mr. Mark Anthony C. Burgonio, MSc, they conducted the study entitled "Utilization of Lead Aprons Among Radiologic Technologists: A Basis for Strengthening Radiation Protection." Their research focused on assessing the utilization of lead aprons among radiologic technologists in private and government hospitals in the City of San Fernando, La Union. Specifically, the study aimed to determine the level of compliance with lead apron use and examine whether significant differences existed based on hospital type and demographic profile. Through this study, the researchers aimed to contribute to the strengthening of radiation protection practices and promote occupational safety among radiologic technologists in diagnostic radiology facilities.