DDC Professional Journal
Vol. 6 No. 2, May 2025
ISSN 1908-3130

# KNOWLEDGE, ATTITUDE, AND PERCEIVED RADIATION SAFETY CULTURE AMONG RADIOLOGIC TECHNOLOGIST IN DAVAO REGION

Florife Bandao Gringco-Llegue

Davao Doctors College
Davao City, Philippines

**Abstract**

This study examined the knowledge, attitudes, and perceived radiation safety culture among Radiologic Technologists in the Davao Region using a descriptive-correlational design. Analysis of 102 convenience-sampled respondents revealed moderate knowledge levels (*M* = 2.84, *SD* = 1.03), neutral attitudes (*M* = 2.46, *SD* = 0.505), and a perceived safety culture requiring improvement (*M* = 3.96, *SD* = 0.486). While educational attainment showed a significant association with safety culture ($\eta$ = 0.214, p = 0.034), other demographic factors (age, sex, experience) and professional competencies (knowledge, attitudes) had no significant influence on safety culture perceptions. The findings suggest that current knowledge and attitude levels among technologists in private hospitals and clinics do not strongly predict safety culture implementation, despite their routine radiation safety practices during X-ray procedures. The study concludes that while educational background influences safety culture, institutional interventions—such as targeted training programs and improved communication channels—are essential to enhance professional competencies and workplace safety culture. Implementing these measures could bridge existing gaps, leading to better knowledge retention, more positive attitudes, and a stronger radiation safety environment in radiology departments.

**Keywords:** *Knowledge, Attitude, Perceived Radiation Safety culture, Descriptive - Correlational, Davao Region Philippines*

Corresponding email: florifellegue286@gmail.com
ORCID ID: https//orcid.org/0009-0001-0180-1577

## Introduction

The risks from missing training related to the unrecorded exposure of employees to ionizing radiation are significant for the Radiology Department, as employees do not observe the basic safety measures concerning radiation (Alemayehu et al., 2023). Cultivating an effective radiation safety culture requires strong leadership and collaboration, while gaps in communication can lead to safety operational failures (Chau, 2024). The escalation of radiation-related workplace incidents, however, poses acute risks of severe biological exposure consequences to Radiologic Technologists (Akram & Chowdhury, 2020).

Studies indicate inconsistent compliance with radiation safety protocols, particularly in mobile X-ray procedures, resulting in a comprehension gap (Abuzaid et al., 2022). Overconfidence in knowledge also contributes to the improper use of ionizing radiation, endangering Radiologic Technologists (Conradsen et al., 2024). In Cyprus, malpractice in radiation safety measures has been observed among radiographers (Zervides et al., 2020). Additionally, negative attitudes among Radiologic Technologists—such as inflexibility and lack of empathy—harm interpersonal and intrapersonal safety culture (Moore, 2020). Miscommunication and a lack of awareness further exacerbate these issues, as safety practices are often not properly explained to colleagues (Ribeiro et al., 2020).

In the Philippines, approximately 22,000 radiology staff are occupationally exposed to radiation (Patrick William, 2020). However, many radiographers lack a clear understanding of their roles and responsibilities (Ramil et al., 2022). Workplace discipline is another concern, as the absence of strict protocols undermines radiation safety practices (Moore, 2023). Challenges such as limited training resources and the need for advanced imaging technologies further hinder safety compliance. To strengthen radiation safety culture, radiographers must increase research engagement. Unfortunately, obstacles such as short attention spans (34%), a lack of research-oriented culture (48%), and limited awareness of opportunities (36%) persist (Alrehily et al., 2024).

Moreover, a study by Dean et al. (2022) found that in the Philippines, 40% of healthcare workers were exposed to radiation due to improper use of protective shields. These findings highlight how lack of knowledge and overconfidence contribut e to unrecognized safety risks in Radiologic practice. Research Purpose this study aims to examine the perceived radiation safety culture among Radiologic Technologists in the Davao Region. The results will serve as a basis for enhancing safety practices and developing an intervention program to address existing gap.

**Method**

The Radiologic Technologists in the private hospitals and clinics in Davao Region were the respondents of this Quantitative study. The study employed a convenient sampling Technique. The stratification was based on the Radiologic Technologist who practiced X-ray and Mobile X-ray. The computed sample size of this study is 102 respondents using SPSS software calculation. In the context of the study, only those who consented to participate in the study were sampled, which totaled 102 respondents.

The study was conducted and illustrated the web-based survey method in the form of Google Forms instead of a paper survey due to the far-flung areas of the respondents. Before the dissemination of the survey questionnaire, the instrument was subjected to validation and reliability testing. Three experts in the field were asked to validate the research instrument. After this, the researcher conducted a pilot study where twenty-five (25) respondents were requested to answer the survey questionnaire. It passed a Cronbach's Alpha reliability analysis or consistency testing.

There were four parts of the questionnaire. The first part of the questionnaire pertains to the respondent's Demographic Profile. This includes age group, sex, educational attainment, and length of professional service. The second part of the questionnaire contained questions that sought a certain level of knowledge and experience of the concept of Radiation Safety practice. The third part of the questionnaire contains the self-assessment tool of attitude. The fourth part of the questionnaire comprises the questions pertaining to respondents' level of perceived radiation safety practiced among Radiologic Technologists.

The study incorporated Frequency Distribution and Percentage to describe the Radiologic Technologist Demographic Profile in terms of age group, sex, educational attainment, and length of professional service. In addition, the mean was used to measure the level of knowledge and attitude of Radiologic Technologists in Radiation safety practice. Spearman Rho was utilized to determine the association between Radiologic Technologist knowledge and attitude practice on radiation safety practice, while Eta correlation determined the association of the demographic profile of knowledge and attitude toward Radiation Safety practice.

**Result and Discussion**

Mean and Standard Deviation Results

Table 1: *Demographic Profile of Respondents.*

| Age Group | Frequency | Percent |
|---|---|---|
| 1 | 92 | 90.20% |
| 2 | 9 | 8.80% |
| 3 | 1 | 1.00% |
| Total | 102 | 100.00% |
| **Sex** | | |
| Female | 52 | 51.00% |

| | | |
|---|---|---|
| Male | 50 | 49.00% |
| **Educational Attainment** | | |
| Associate Degree | 3 | 2.90% |
| Bachelor's Degree | 94 | 92.20% |
| Master's Degree | 5 | 4.90% |
| Total | 102 | 100.00% |
| **Years of Experience** | | |
| 11 years or above | 15 | 14.70% |
| 2 years to 5 years' experience | 37 | 36.30% |
| 6 years to 10 years' experience | 29 | 28.40% |
| Less than 6 months to 1 year experience | 21 | 20.60% |
| | 102 | 100.00% |

Table 1 presents study population showed distinct demographic characteristics. The middle-aged group (35-45 years) was moderately represented with 9 participants (8.8%), while the older age group (45-59 years) was significantly underrepresented, comprising only one individual (1%). Gender distribution was nearly equal, with males representing 49.0% (n=50) and females 51.0% (n=52) - a mere two-person difference. Educational attainment was predominantly at the bachelor's level (92.2%, n=94), with smaller proportions holding associate (2.9%, n=3) or master's degrees (4.9%, n=5). Regarding professional experience, the largest cohort had 2-5 years of service (36.3%, n=37), followed by those with 6-10 years (28.4%, n=29), less than 6 months to 1 year (20.6%, n=21), and 11+ years of experience (14.7%, n=15).

Table 2. *The level of knowledge on radiation safety among Radiologic Technologists.*

| Knowledge | Mean | SD | Interpretation |
|---|---|---|---|
| Overall | 2.84 | 1.03 | Moderate |

*Legend: Knowledge scores were categorized as follows: 4.20-5.00 = Very High; 3.40-4.19 = High; 2.60-3.39 = Moderate; 1.80-2.59 = Low; 1.00-1.79 = Very Low*

Table 2 presents the participants' level of knowledge regarding radiation safety. The descriptive-correlational analysis revealed a mean knowledge score of 2.84 (SD = 1.03), slightly below the midpoint, indicating moderate understanding of radiation safety principles. While some respondents demonstrated adequate knowledge, most showed low to moderate comprehension, underscoring the need for targeted educational interventions. These findings align with Rajendra's (2024) study in diagnostic radiography, suggesting opportunities for improvement in exposure practices and identification of knowledge gaps.

Furthermore, Alburayh et al. (2025) emphasize the importance of specialized training programs and focused educational initiatives to address knowledge deficiencies, correct misconceptions, and enhance understanding of radiation risks and safety procedures. This perspective is supported by Bahakeem et al. (2024), who advocate for proactive public education to increase awareness of radiation hazards and promote safer practices among both professionals and the general population.

Table 3. The level of Attitude on Radiologic Safety among Radiologic Technologists.

| Attitude | Mean | SD | Interpretation |
|---|---|---|---|
| Overall | 2.46 | 0.505 | Neutral |

**Legend** *4.21-5.00 Strongly Agree; 3.41-4.20 Agree; 2.61-3.41Neutral; 1.81-2.60 Disagree; 1.00-1.80 Strongly Agree*

Table 3 shows the attitude scale was interpreted as follows: 4.21-5.00 (Strongly Agree), 3.41-4.20 (Agree), 2.61-3.41 (Neutral), 1.81-2.60 (Disagree), and 1.00-1.80 (Strongly Disagree). Table 3 reveals a neutral attitude toward radiologic safety among radiologic technologists (M = 2.46), suggesting a marginally negative or indifferent stance. The relatively low standard deviation (SD = 0.505) indicates that most responses clustered closely around the mean, showing little variation among participants.

These findings align with Fogleman's (2024) research on workplace burnout, which suggests that accumulated distress from historical events can escalate into significant organizational or social challenges, sometimes perceived as self-inflicted conditions. Conversely, Fagbade (2024) argues that flexible systems can address these issues by eliminating sensitive parameters through adaptability, ensuring workflow resilience, and creating new problem-solving approaches.

.

Table 4: The level of Perceived Radiation Safety among Radiologic Technologists

| Indicator | Mean | SD |
|---|---|---|
| Personal Accountability | 4.48 | 0.575 |
| Teamwork in Imaging | 4.43 | 0.721 |
| Questioning Attitude | 3.61 | 0.795 |
| Feedback Loops | 4.14 | 0.760 |
| Organizational Learning | 4.31 | 0.663 |
| Leadership Action | 3.55 | 0.835 |
| Teamwork Across Imaging Stakeholders | 3.77 | 0.748 |
| Nonpunitive Response | 3.42 | 0.904 |
| Error Reporting | 3.64 | 0.824 |
| Radiation Policy | 4.30 | 0.617 |
| Overall Perception of Radiation Safety | 3.75 | 0.704 |
| Effective Dose Self-Grade | 3.96 | 1.098 |
| Effective Dose Self-Explanation | 3.76 | 1.073 |
| Perceived Radiation Exposure Dose Knowledge | 4.15 | 0.927 |
| Perceived of Image Appropriateness | 4.15 | 0.927 |
| Perceived Radiation Safety Culture | 3.96 | 0.486 |

**Legend**: *Knowledge scores were categorized as follows: 4.20-5.00= Very High; 3.40-4.19 = High; 2.60-3.39 = Moderate;1.80-2.59 Low; 1.79 = Very Low*

Table 4 presents the perceptions of radiation safety culture across various dimensions. The highest mean scores were observed for personal accountability (M = 4.48, SD = 0.575) and teamwork in imaging (M = 4.43, SD = 0.721), indicating strong individual responsibility and effective collaboration among professionals. Similarly, organizational learning (M = 4.31, SD = 0.663), radiation policy awareness (M = 4.30, SD = 0.617), and feedback mechanisms (M = 4.14, SD = 0.760) demonstrated robust performance, suggesting well-established continuous improvement processes.

However, several areas showed room for improvement, particularly in leadership support for safety discussions (M = 3.55, SD = 0.835), nonpunitive response to errors (M = 3.42, SD = 0.904), and questioning attitude (M = 3.61, SD = 0.795). Moderate scores for error reporting (M = 3.64, SD = 0.824) and interdepartmental teamwork (M = 3.77, SD = 0.748) suggest opportunities to enhance cross-functional collaboration and incident reporting culture.

The overall perception of radiation safety (M = 3.75, SD = 0.704) and safety culture (M = 3.96, SD = 0.486) remained positive, though variability in certain dimensions highlights specific improvement areas. Additional insights emerged from education and preparedness measures: EDSG (M = 3.96, SD = 1.098), EDSE (M = 3.76, SD = 1.073), PREDK (M = 4.15, SD = 0.927), and POIA (M = 4.15, SD = 0.927).

These findings align with Burgess et al. (2022), who noted effective cooperation patterns among healthcare providers that facilitate knowledge exchange and continuous improvement. However, as Chinese (2021) cautioned, workplace environment quality significantly impacts radiation safety implementation, underscoring the need to address cultural elements that may enable disruptive behaviors affecting safety culture.

Table 5. The significant relationship between level of Knowledge on Perceived Radiation Safety.

| | Perceived Radiation Safety | | | |
|---|---|---|---|---|
| Independent Variables | $r_s$ | p-value | Decision | Remarks |
| **Knowledge** | 0.123 | 0.219 | Accept $H_{01}$ | Not Significant |

Note: *Spearman's rank correlation coefficient: weak (0.00–0.19); moderate (0.20–0.39); strong (0.40–0.59); very strong (0.60–0.79); extremely strong (0.80–1.00) correlations.; p < 0.05 = S-Significant; NS- Not significant*

Table 5 presents the relationship between radiation safety knowledge and perceived safety culture, as measured by Spearman's rho correlation coefficient (ρ = 0.123). This weak positive correlation (p = 0.219) fails to reach statistical significance at the conventional α = 0.05 threshold, suggesting the observed association may be attributable to chance. These results indicate that differences in knowledge levels do not substantially influence perceptions of radiation safety culture, implying that other organizational or environmental factors – such as institutional policies, workplace conditions, or professional experience – may play more decisive roles in shaping safety culture perceptions.

These findings align with Vinodkumar and Bhasi's (2010) research demonstrating that comprehensive safety management systems (encompassing training, motivation, and compliance) better predict safety outcomes than knowledge alone. Furthermore, Claxton and Sharma (2022) observed that while healthcare professionals value safety information, practical implementation challenges often arise in clinical settings, potentially explaining the disconnect between knowledge and cultural perceptions identified in our study.

Table 6: The significant relation between the Attitude level and Perceived Radiation safety culture

| | Radiation Safety Culture | | | |
|---|---|---|---|---|
| Independent Variables | $r_s$ | p-value | Decision | Remarks |
| **Attitude** | -0.029 | 0.770 | Accept $H_{02}$ | Not Significant |

*Spearman's rank correlation coefficient: weak (0.00–0.19); moderate (0.20–0.39); strong (0.40–0.59); very strong (0.60–0.79); extremely strong (0.80–1.00) correlations.; p < 0.05 = S-Significant; p ≥ 0.05 = NS-Not Significant.*

Table 6 examines the association between attitudes toward radiation safety practices and perceived radiation safety culture, revealing a negligible negative correlation (Spearman's ρ = -0.029, p > 0.770). This statistically non-significant result (exceeding the α = 0.05 threshold) suggests that individual attitudes toward radiation safety have minimal influence on overall perceptions of safety culture among respondents.

These findings imply that other organizational or environmental factors likely play more substantial roles in shaping radiation safety culture perceptions, highlighting the need for further investigation. This conclusion aligns with Moore et al. (2022), who identified radiation safety culture as a multifaceted construct requiring consideration of multiple intervening variables, with the socioecological model being particularly appropriate for examining these relationships in medical imaging contexts. Similarly, Grabowska-Lepczak's (2021) evaluation of public knowledge, attitudes, and safety perceptions regarding sustainable development supports this interpretation.

| | Knowledge of Radiation Safety | | | |
|---|---|---|---|---|
| Demographic profile | η | p-value | Decision | Remarks |
| Age | 0.177 | 0.077 | Accept $H_{03}$ | Not significant |
| Sex | 0.041 | 0.681 | Accept $H_{03}$ | Not significant |
| Educational Attainment | 0.248 | 0.695 | Accept $H_{03}$ | Not significant |
| Years of Experience | 0.199 | 0.160 | Accept $H_{03}$ | Not significant |
| **Overall** | **0.166** | **0.40325** | **Accept $H_{03}$** | **Not significant** |

Note: *$p<0.05$ (Significant); NS-Not Significant*

Table 7 examines the relationship between demographic characteristics and radiation safety knowledge using cross-tabulation, Eta correlation (η), and Pearson correlation analyses. The Eta correlation results revealed weak, statistically non-significant associations between knowledge levels and all demographic factors: age group ($\eta = 0.177, p > 0.05$), sex ($\eta = 0.041, p > 0.05$), educational attainment ($\eta = 0.248, p > 0.05$), and years of experience ($\eta = 0.199, p > 0.05$). While younger professionals were most represented across knowledge levels, these findings collectively support accepting the null hypothesis that demographic factors do not significantly predict radiation safety knowledge.

The Pearson correlation analysis confirmed these results, showing non-significant correlations for age ($p = 0.077$), years of experience ($p = 0.160$), sex ($p = 0.681$), and educational attainment ($p = 0.695$). These consistent results suggest that radiation safety knowledge is not substantially influenced by demographic characteristics, but rather may depend more on institutional training programs, workplace policies, and individual motivation.

These findings align partially with Buades-Sitjar et al. (2022), who identified age as a positive knowledge predictor only until 50 years, after which the relationship reversed. However, they contrast with Alhorani et al. (2024)'s conclusion that procedural knowledge was significantly affected by clinical experience. This discrepancy highlights the need for future research to focus on non-demographic predictors and examine knowledge components separately, as suggested by practical wisdom frameworks.

Further investigation should particularly explore how training quality, workplace learning environments, and professional motivation influence knowledge acquisition among radiologic technologists.

Table 8: The significant association between the demographic profile level and Attitude on Radiation Safety.

| | Attitude of Radiation Safety | | | |
|---|---|---|---|---|
| Demographic profile | η | p-value | Decision | Remarks |
| Age | 0.179 | 0.699 | Accept $H_{04}$ | Not significant |
| Sex | 0.039 | 0.696 | Accept $H_{04}$ | Not significant |
| Educational Attainment | 0.151 | 0.168 | Accept $H_{04}$ | Not significant |

| | | | | |
|---|---|---|---|---|
| Years of Experience | 0.074 | 0.479 | Accept $H_{04}$ | Not significant |
| **Overall** | **0.111** | **0.511** | **Accept $H_{04}$** | **Not significant** |

*Note: p<0.05 (Significant); NS-Not Significant; η = eta*

Table 8 presents the analysis of relationships between demographic characteristics and attitudes toward radiation safety using cross-tabulation and correlation analyses. The Eta measure revealed a moderate association between age group and attitude (η = 0.179), while sex showed only a weak relationship (η = 0.039). Cross-tabulation results indicated an even distribution of attitude scores across male and female respondents. Educational attainment demonstrated a weak association with attitude (η = 0.151), with most responses clustering in mid-range attitude scores regardless of education level. Years of experience showed a modest relationship (η = 0.074-0.111), with more experienced professionals generally displaying slightly more positive attitudes.

Pearson correlation analysis confirmed these patterns, revealing no statistically significant relationships between attitude and any demographic variables: age (p = 0.696), sex (p = 0.696), education level (p = 0.168), or years of experience (p = 0.479). The only significant correlation emerged between age and years of experience, reflecting expected career progression patterns.

These findings align with Haynes' (2018) research, which found consistent professional values among radiologic technologists regardless of demographic differences. However, they partially contrast with Heravi et al. (2024), who identified stronger relationships between job titles, education, experience, and radiation safety knowledge.

The current results suggest that while demographic factors may subtly influence attitudes, their impact is not statistically significant, emphasizing the potential importance of organizational culture and targeted training programs in shaping safety attitudes
.

Table 9: The significance association demographic profile and level of Perceived radiation safety.

| | Perceived of Radiation Safety | | | |
|---|---|---|---|---|
| Demographic profile | η | p-value | Decision | Remarks |
| Age | 0.05 | 0.941 | Accept $H_{05}$ | Not significant |
| Sex | 0.184 | 0.065 | Accept $H_{05}$ | Not significant |
| Educational Attainment | 0.214 | 0.034 | Accept $H_{05}$ | Significant |
| Years of Experience | 0.218 | 0.695 | Accept $H_{05}$ | Not significant |
| **Overall** | **0.167** | **0.434** | **Accept $H_{05}$** | **Not significant** |

*Note: p<0.05 (Significant); NS-Not Significant; η = eta*

Table 9 examines the relationship between demographic factors and perceived radiation safety culture among Radiologic Technologists using Eta and Pearson correlation analyses. The Eta correlation, which measures associations between categorical independent variables (e.g., age group, sex) and continuous dependent variables (safety culture scores), revealed weak associations for age (η = 0.05), sex (η = 0.184), educational attainment (η = 0.214), and years of experience (η = 0.218), with an overall η = 0.167. These results suggest minimal variation in safety culture perceptions across demographic groups.

Pearson correlation analysis, assessing linear relationships between continuous variables, further supported these findings. No statistically significant correlations were observed for age (p = 0.941), sex (p = 0.065), or years of experience (p = 0.695).

Educational attainment showed a marginally significant association (p =

0.034), though the effect size remained small. Cross-tabulation results indicated that younger professionals (Age Group 1.0) comprised the majority of respondents, with representation across all safety culture levels, while older age groups were underrepresented.

These findings imply that demographic factors—age, sex, education, and experience—do not substantially influence perceptions of radiation safety culture. Instead, institutional factors such as workplace policies, specialized training, and organizational safety climate may play more critical roles. This aligns with Bazzi et al. (2024), who emphasize that robust safety cultures and supportive work environments are essential for effective dose-reduction strategies. Similarly, Moore (2021) highlights the importance of professional actions in fostering a positive safety culture, while Goula et al. (2021) underscore the detrimental effects of knowledge gaps on radiation safety practices.

Future research should prioritize non-demographic factors, including training quality, institutional support, and safety culture initiatives, to better understand and enhance radiation safety practices in clinical settings.

**Conclusion and Recommendation**

Radiologic Technologist exhibit moderate knowledge and neutral attitude highlighting the need structured training. The findings are clear on the level of knowledge. The study found that Radiologic Technologists in private hospitals and clinics know about radiation has a moderate level (*M*=2.84). A similar result was shown on the level of attitude of Radiologic Technologists with an overall mean of 2.46. The result indicates a disagreement that is insignificant on perceived radiation safety culture, with a mean of 3.96, indicating highlights improvement in radiation safety culture. Further, the relationship between the knowledge and perceived radiation safety correlation coefficient of 0.123 indicated a weak positive correlation on the dependent variable in perceived radiation safety culture. Likewise, the attitude toward radiation safety with the standard coefficient of 0.011 indicated an extremely weak, statistically insignificant, remarkable result on the dependent variable of perceived radiation safety culture. This may indicate that there is no significant relationship between the knowledge and attitude toward radiation safety and the dependent variables.

However, demographic profile and level of knowledge on radiation safety and perceived radiation safety culture are not statistically significant. Correspondingly, on the level of attitude toward radiation safety practice among Radiologic Technologists, their indirect relationship is not statistically important. This may represent that there is a strong relationship and statistical significance between the demographics of educational attainment and perceived radiation safety culture.

With these conclusions, recommendations are drawn. Institutions should implement continuous education on radiation safety. Promote open communication and nonpunitive error reporting. Future Researcher should explore mixed method approaches and technological impacts on safety culture.

**References:**

Abuzaid, M. M., Elshami, W., & Tekin, H. O. (2022). Infection control and radiation safety practices in the radiology department during the COVID-19 outbreak. *PLoS One*, *17*(12), e0279607.

Akram, S., & Chowdhury, Y. S. (2020). Radiation exposure of medical imaging.

Alburayh, A. A., Alosaimi, M., Alshumiesy, H., Alzahrani, A. T., Alkhars, Ethiopia. Plos one, 18(5), e0286400.

Alemayehu, T. G., Bogale, G. G., & Bazie, G. W. (2023). Occupational radiation exposure dose and associated factors among radiology personnel in Eastern AmharaAbuzaid, M. M., Elshami, W., & Tekin, H. O. (2022). Infection control and radiation safety practices in the radiology department during the COVID-19 outbreak. PLoS One, 17(12), e0279607.

Alrehily, F. A., Alsharif, W., Aloufi, Y., Alsaedi, A., Aljohani, M., Alotaibi, R. S., ... & Qurashi, A. (2024). Navigating challenges in radiography research: radiographers' perspectives in Saudi Arabia. PeerJ, 12, e18125.

Bahakeem, B., Binafeef, R., Alammar, R., Aljadaibi, A., Alshammari, A., Alshammari, F., ... & Alzahrani, K. (2024). Knowledge, Attitude, and Perception Regarding Radiation Hazards and Protection among Saudi Arabia's General Population. Archives of Pharmacy Practice, 15(1-2024), 1-9.

Bawazeer, O. A. (2022). Assessment of diagnostic reference levels awareness and knowledge amongst CT radiographers in Saudi Arabia. *Journal of Radiation Research and Applied Sciences*, *15*(2), 98-105.

Bazzi, M., Afram, S. S., Ndipen, I. M., Kåreholt, I., & Bjällmark, A. (2024). Factors affecting radiographers' use of dose-reduction measures. *Journal of Radiological Protection*, *44*(1), 011506.

Buades-Sitjar, F., Boada, R., Guasch, M., Ferré, P., Hinojosa, J. A., & Duñabeitia, J. A. (2022). The predictors of general knowledge: Data from a Spanish megastudy. Behavior Research Methods, 54(2), 898-909.

Burgess, N., Currie, G., Crump, B., & Dawson, A. (2022). Leading change across a healthcare system: How to build improvement capability and foster a culture of continuous improvement: Lessons from an evaluation of the NHS-VMI partnership.

Chau, M. (2024). Enhancing safety culture in radiology: Key practices and recommendations for sustainable excellence. Radiography, 30, 9-16.

Chinene, B. (2021). Framework to mitigate disruptive behaviours involving radiographers at central hospitals in Harare Metropolitan Province, Zimbabwe (Doctoral dissertation, Durban University of Technology).

Claxton, G., Hosie, P., & Sharma, P. (2022). Toward an effective occupational health and safety culture: A multiple stakeholder perspective. *Journal of safety research*, *82*, 57-67.

Conradsen, S., Vardinghus-Nielsen, H., & Skirbekk, H. (2024). Patient Knowledge and Trust in Health Care. A Theoretical Discussion on the Relationship Between Patients' Knowledge and Their Trust in Health Care Personnel in High Modernity. Health Care Analysis, 32(2), 73-87.

Dean, K. M. R., Panlaqui, A., Betos, C. M., & Acha, J. A. (2022). Radiation exposure to extremities in medical applications and its implications for the radiation protection of workers in the Philippines. Journal of Radiological Protection, 42(3), 031517.

Fagbade, A. I. (2024). Continuous eddy simulation for turbulent flows. University of Wyoming.

Fakhar, H. B., Shamshiri, A., Momeni, Z., Niknami, M., & Kianvash, N. (2019). Development of a questionnaire to evaluate the knowledge and attitudes of medical students regarding radiation protection. Journal of Dental Materials and Techniques, 8(3), 129-134.

Fogleman, E. M. (2024). Unproductive Feelings: The Moral Framing of Burnout Across Three Domains (1970–2023). University of California, Davis.

Goula, A., Chatzis, A., Stamouli, M. A., Kelesi, M., Kaba, E., & Brilakis, E. (2021). Assessment of health professionals' attitudes on radiation protection measures. International journal of environmental research and public health, 18(24), 13380.

Grabowska-Lepczyk, I. (2021). The role of education in shaping safe behaviours and attitudes in the aspect of sustainable development. *De Securitate et Defensione. O Bezpieczeństwie i Obronności*, *7*(1), 151-174.

Haynes, K. W. (2018). The importance of professional values from radiologic technologists' perspective. University of Louisiana at Monroe.

Heravi, M. A. Y., Keshtkar, M., Khoshdel, E., Pishgadam, M., Poorbarat, S., & Hesari, M. J. (2024). Evaluation of the Status of Knowledge, Attitude, and Performance of Radiology Department Staff Regarding Radiation Safety Principles at Hospitals in the North and Northeast of Iran. Frontiers in Biomedical Technologies.

Moore, Q. T. (2020). Radiation Actions and Dimensions of Radiation Safety among US Radiologic Technologists (Doctoral dissertation, Northern Illinois University).

Moore, Q. T. (2021). Validity and reliability of a radiation safety culture survey instrument for radiologic technologists. Radiologic Technology, 92(6), 547-560.

Moore, Q. T. (2023). Perceptions of Radiation Safety Culture Among Radiography, Computed Tomography, And Mammography Technologists. Radiologic Technology, 95(1), 17-25.

Moore, Q. T., Walker, D. A., Frush, D. P., Daniel, M., & Pavkov, T. W. (2022). Intrapersonal and institutional influences on overall perception of radiation safety among radiologic technologists. *Radiologic Technology*, *93*(3).

Patrick Williams, IAEA Department of Nuclear Safety and Security https://www.iaea.org/newscenter/news/orpas-mission-to-philippines-highlights-efforts-to-

Rajendra, Y. (2024). Knowledge, attitude, and practices of final-year diagnostic radiography students on setting exposure factors, at the University of Technology, in the eThekwini District (Doctoral dissertation).

Ramil, R. J., Ines-Ramil, M. D., Viado-Rojas, J., & Bautista, L. M. (2022). Knowledge and Perception of Healthcare Professionals about the Need for Radiopharmacists in Hospitals in the Philippines. Indian Journal of Pharmacy Practice, 15(1).

Ribeiro, A., Husson, O., Drey, N., Murray, I., May, K., Thurston, J., & Oyen, W. (2020). Ionising radiation exposure from medical imaging–A review of Patient's (un) awareness. Radiography, 26(2), e25-e30.

Vinodkumar, M. N., & Bhasi, M. (2010). Safety management practices and safety behaviour: Assessing the mediating role of safety knowledge and motivation. *Accident Analysis & Prevention*, *42*(6), 2082-2093.

Zervides, C., Sassis, L., Kefala-Karli, P., Christou, V., Derlagen, A., Papapetrou, P., & Heraclides, A. (2020). Assessing radiation protection knowledge in diagnostic radiography in the Republic of Cyprus. A questionnaire survey. Radiography, 26(2), e88-e93.