ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 5 (May 2026)

Perception and Technical Competencies in the Use of Teleradiology among Radiologists in Selected Private Hospitals in Laguna

Tristan A. Perez, RRT
University of Perpetual Help System Dalta - Calamba Campus
tantanperez99@gmail.com

Date Submitted:
April 25, 2026

Date Accepted:
May 6, 2026

Date Published:
May 18, 2026

DOI:
10.5281/zenodo.20267297

ABSTRACT

The study assessed the perceptions and technical competencies of radiologists in using teleradiology systems in selected private hospitals in Laguna, Philippines. A descriptive-correlational research design was employed, and data were collected from thirty radiologists using a structured questionnaire that measured perceived usefulness, ease of use, satisfaction, and technical skills, including system navigation, image manipulation, report generation, and data security. The study also examined the influence of demographic variables such as age, sex, position, and years of professional experience on perception and competency levels.

Results indicated that radiologists generally perceive teleradiology as useful and moderately easy to use, with satisfaction levels reflecting a positive attitude toward technology adoption. Technical competency was highest in clinical tasks such as image interpretation and report generation, while lower scores were observed in system troubleshooting, advanced image manipulation, and adherence to data security protocols. Professional experience was positively correlated with technical competency, whereas age and gender did not show significant associations.

The study concludes that while radiologists are capable of using teleradiology effectively, targeted training and ongoing technical support are necessary to address specific competency gaps. The findings underscore the importance of structured training programs and support systems to optimize teleradiology utilization, improve diagnostic workflow efficiency, and ensure high-quality patient care in private hospital settings.

Keywords: *teleradiology, radiologists, technical competency, perception, workflow efficiency, telemedicine adoption, private hospitals, image interpretation, digital health, professional experience*

INTRODUCTION

The emergence of teleradiology has transformed the landscape of medical diagnostics by enabling radiologists to interpret diagnostic imaging remotely. This technological advancement has not only expanded the scope of diagnostic services but also enhanced access to quality healthcare, particularly in

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 5 (May 2026)

remote and underserved regions (Butzner & Cuffee, 2021; Dazai, 2023). Teleradiology facilitates high-resolution image sharing and real-time consultations, improving the efficiency and effectiveness of radiological assessments while bridging geographical disparities in healthcare delivery.

The COVID-19 pandemic further highlighted the value of teleradiology, ensuring continuity of care while minimizing the risk of infection through remote diagnostics (Pankhania, 2020). Despite the growing adoption of teleradiology globally, limited research has focused on the perceptions and technical competencies of radiologists in its practical application. While the clinical, economic, and operational benefits of teleradiology are well-documented, understanding the subjective experiences of radiologists is critical to identifying areas for improvement and fostering effective adoption (Rackimuthu et al., 2022; Al-Dahery et al., 2023).

Radiologists' technical competencies encompass proficiency with imaging software, secure data handling, radiology information systems, quality assurance, telemedicine platforms, and the integration of data analytics and artificial intelligence (Ranschaert, 2020). Competency in these domains directly impacts the quality of diagnostic services and patient outcomes. Similarly, radiologists' perceptions of teleradiology—including perceived usefulness and ease of use—can influence acceptance, adoption, and effective utilization of the technology (Smith et al., 2020).

The study was anchored on the Technology Acceptance Model (TAM), which posits that perceived usefulness and ease of use determine the likelihood of technology adoption (Davis, 1989; Worthing, 2021; AlQudah et al., 2021). Using TAM as a framework, this study examined how radiologists' perceptions and technical competencies interact, and how demographic variables (age, sex, current position, and years in service) influence both perception and competency levels.

The research specifically aimed to evaluate the perception and technical competencies of radiologists in teleradiology within selected private hospitals in Laguna, Philippines. The findings are expected to inform targeted interventions to improve adoption, optimize training programs, and enhance healthcare delivery through effective teleradiology implementation.

Review of Related Literature

Teleradiology in Modern Healthcare

Teleradiology is the electronic transmission of radiological images from one location to another for the purposes of interpretation, consultation, and diagnosis. It allows radiologists to provide services remotely, improving access to specialized care in regions where radiology expertise is limited (Ranschaert, 2020). The technology has evolved from simple image transfer systems to fully integrated platforms capable of supporting high-resolution imaging, secure data storage, and advanced analytic tools, including artificial intelligence. Studies indicate that teleradiology reduces diagnostic turnaround times, improves patient management, and facilitates real-time collaboration between radiologists and clinicians (Dazai, 2023; Butzner & Cuffee, 2021).

Technical Competencies in Teleradiology

Effective utilization of teleradiology requires radiologists to possess specific technical competencies. These include proficiency in using Picture Archiving and Communication Systems (PACS), Radiology Information Systems (RIS), and secure cloud-based storage for image handling. Competency

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 5 (May 2026)

also involves understanding image quality, data security protocols, telecommunication software, and integration with hospital electronic medical record systems (Ranschaert, 2020; Smith et al., 2020). In addition, the ability to interpret images accurately in a remote environment, manage digital workflow, and maintain compliance with health data privacy standards is essential to ensure diagnostic reliability and patient safety.

Perceptions of Teleradiology

Radiologists' perceptions of teleradiology play a critical role in the adoption and effective use of the technology. Positive perceptions, such as high perceived usefulness and ease of use, increase the likelihood of technology acceptance and consistent utilization (Davis, 1989; Worthing, 2021). Conversely, concerns about technical complexity, workflow disruption, or reduced interpersonal interaction may hinder adoption (Al-Dahery et al., 2023). Understanding perception is therefore critical in designing training programs, implementation strategies, and support systems to encourage effective use.

Impact on Workflow and Patient Care

The literature highlights that teleradiology improves efficiency in clinical workflows by enabling radiologists to manage caseloads remotely and consult specialists across different locations (Rackimuthu et al., 2022). Teleradiology has been associated with faster diagnosis, reduced patient waiting times, and improved access to subspecialty expertise. However, studies also caution that suboptimal technical skills and limited familiarity with teleradiology systems can negatively affect diagnostic accuracy and workflow efficiency (Pankhania, 2020). Therefore, both technical competencies and positive perception are essential determinants of successful teleradiology integration.

Theoretical Framework

This study is anchored on the Technology Acceptance Model (TAM), which posits that perceived usefulness and ease of use are primary predictors of technology adoption (Davis, 1989; AlQudah et al., 2021). TAM has been applied widely in healthcare technology research to assess clinicians' acceptance of telemedicine platforms, electronic health records, and diagnostic software. Applying TAM in the context of teleradiology allows for a structured assessment of how radiologists' perceptions and competencies influence their engagement with the technology and the overall effectiveness of service delivery.

Research Gap

Despite the increasing implementation of teleradiology in hospitals, few studies in the Philippines have systematically examined the relationship between radiologists' technical competencies and their perceptions of teleradiology. In particular, research is limited regarding private hospital settings in Laguna, where adoption may vary due to differences in resources, infrastructure, and training. This study addresses these gaps by evaluating both perception and technical competencies among radiologists in selected private hospitals, providing evidence-based recommendations for optimizing teleradiology adoption and utilization.

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 5 (May 2026)

METHODOLOGY

Research Design

This study employed a descriptive-correlational research design to examine the perceptions and technical competencies of radiologists in using teleradiology systems at selected private hospitals in Laguna, Philippines. The descriptive component aimed to assess radiologists' attitudes, perceptions, and self-reported technical skills, while the correlational component investigated the relationship between perception, technical competency, and demographic variables, including age, sex, position, and years of professional experience. This design was appropriate because it allowed the researchers to collect quantitative data on both subjective perceptions and objective competency measures without manipulating the clinical environment.

Research Locale

The study was conducted in selected private hospitals in Laguna, where teleradiology systems are actively used for image interpretation and teleconsultation. These hospitals were chosen due to their adoption of teleradiology technology, availability of trained radiologists, and willingness to participate in research activities. Institutional approvals were obtained from hospital administration and ethics committees to conduct the study. All respondents' identities were anonymized, and data confidentiality was strictly maintained throughout the research process. Observations and surveys were conducted without interfering with routine clinical operations.

Respondents of the Study

The respondents consisted of radiologists currently employed in the selected hospitals, actively using teleradiology systems as part of their clinical practice. Inclusion criteria required that participants: (1) hold a valid radiology license, (2) have at least one year of experience using teleradiology systems, and (3) be actively involved in diagnostic imaging interpretation. A total of thirty radiologists participated, providing insights into both their perceptions of the technology and their self-assessed technical competencies.

Research Instrument

Data were collected using a structured questionnaire divided into three sections: (1) demographic information, including age, sex, position, and years of service; (2) perceptions of teleradiology, measuring constructs such as perceived usefulness, ease of use, and satisfaction; and (3) technical competencies, evaluating radiologists' skills in system navigation, image manipulation, telecommunication procedures, and digital report generation. Items were measured on a five-point Likert scale, with higher scores indicating stronger agreement or higher competency. The questionnaire was validated by experts in radiology and medical informatics for content and construct validity.

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 5 (May 2026)

Data Gathering Procedure

The study was conducted in coordination with hospital administrations to schedule survey distribution. Participants were invited to complete the questionnaire electronically via secure online forms or in-person during non-clinical hours to minimize disruption of patient care. Instructions for completing the questionnaire were clearly provided, emphasizing voluntary participation and confidentiality. Completed responses were collected, coded, and stored securely for analysis.

Statistical Treatment of Data

Collected data were analyzed using descriptive and inferential statistics. Descriptive statistics, including mean, standard deviation, frequency, and percentage, summarized respondents' demographics, perception scores, and technical competency levels. Pearson's correlation coefficient was used to examine the relationship between perception and technical competencies, while t-tests and ANOVA were employed to assess differences across demographic variables. Statistical significance was set at $p < 0.05$. These analyses enabled the researchers to quantify relationships between perception, competency, and demographic characteristics, providing insights into factors influencing teleradiology adoption.

Ethical Considerations

Ethical approval for the study was obtained from the participating hospitals' ethics committees. Participation was voluntary, and respondents were informed of their right to withdraw at any time without penalty. All responses were anonymized, and data were stored securely to protect confidentiality. No patient data were accessed or used in the study, and the research posed no risk to participants' professional standing or privacy.

RESULTS AND DISCUSSION

This section presents the findings regarding radiologists' perceptions and technical competencies in the use of teleradiology systems in selected private hospitals in Laguna. Data were analyzed based on survey responses from thirty radiologists, focusing on their attitudes toward system usefulness, ease of use, satisfaction, and self-reported technical skills in operating teleradiology platforms. The study also examined the influence of demographic variables, including age, sex, position, and years of professional experience, on perception and competency levels.

Radiologists' Perception of Teleradiology

Overall, radiologists reported a moderately positive perception of teleradiology. The mean scores for perceived usefulness were 4.1 out of 5, indicating that most respondents agreed that teleradiology improves workflow efficiency, allows timely reporting, and facilitates remote consultation. Perceived ease of use scored slightly lower, with a mean of 3.7, reflecting occasional challenges in navigating system interfaces or adapting to new software features. Satisfaction scores averaged 3.9, suggesting that while respondents valued the technology, some concerns regarding system responsiveness, image resolution, and integration with hospital information systems were noted. These findings align with prior research

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 5 (May 2026)

indicating that while teleradiology enhances accessibility and diagnostic capabilities, technical and usability challenges remain barriers to optimal adoption (Rackimuthu et al., 2022; Al-Dahery et al., 2023).

Technical Competencies in Teleradiology

Radiologists reported moderate to high technical competency levels when using teleradiology systems. The highest scores were observed in tasks such as image interpretation, report generation, and communication of findings to clinicians, with mean scores of 4.2 and 4.1, respectively. Lower scores were noted in areas such as system troubleshooting, advanced image manipulation, and adherence to data security protocols, with mean scores of 3.5–3.7. These results suggest that while radiologists are proficient in clinical application, technical skills related to software optimization and digital workflow management may require further training. This observation corroborates global studies highlighting the need for structured training programs to enhance technical proficiency in teleradiology adoption (Ranschaert, 2020; Smith et al., 2020).

Influence of Demographic Variables

Analysis of demographic variables revealed that radiologists with more than ten years of professional experience reported higher technical competency scores (M = 4.3) compared to those with less than five years of experience (M = 3.8). Age and sex showed no significant correlation with perception or competency scores. Similarly, radiologists holding higher positions (e.g., head of department) demonstrated slightly higher perception and competency levels, suggesting that greater exposure and leadership responsibilities contribute to familiarity with teleradiology systems. These findings highlight that professional experience, rather than age or gender, plays a key role in shaping technical competence and confidence in using telemedicine platforms.

Discussion of Findings

The study confirms that radiologists perceive teleradiology as a useful tool that improves efficiency and facilitates remote diagnostic collaboration. However, moderate ease-of-use scores and lower competency in system troubleshooting indicate that technical barriers persist, potentially limiting the full utilization of the technology. The correlation between professional experience and competency underscores the importance of hands-on exposure and continuous professional development in enhancing proficiency.

These findings are consistent with previous research on telemedicine adoption, which emphasizes that perceived usefulness and technical competency are critical factors influencing technology acceptance (Davis, 1989; AlQudah et al., 2021). Structured training programs, user-friendly interfaces, and technical support mechanisms are recommended to address usability challenges and improve radiologists' confidence in teleradiology systems.

In summary, while teleradiology is valued for its efficiency and remote diagnostic capabilities, its effectiveness depends on radiologists' technical proficiency and ongoing training. Addressing system usability issues and reinforcing technical competencies are essential for maximizing the benefits of teleradiology in private hospital settings.

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 5 (May 2026)

Conclusion

This study evaluated the perceptions and technical competencies of radiologists in the use of teleradiology systems in selected private hospitals in Laguna. The findings revealed that radiologists generally perceive teleradiology as a useful and valuable tool for remote image interpretation, workflow efficiency, and timely reporting. However, while technical competency was moderate to high in clinical tasks such as image interpretation and report generation, areas such as system troubleshooting, advanced image manipulation, and adherence to digital security protocols were less proficient. Professional experience positively influenced technical competency, while age and gender were not significant factors. Overall, the study concludes that radiologists are capable of utilizing teleradiology systems effectively, but targeted training and system support are necessary to address specific technical challenges and optimize utilization.

Implications of the Study

The study provides valuable insights for hospital administrators, IT departments, and policymakers regarding the implementation and optimization of teleradiology systems. First, perceived usefulness and satisfaction indicate that radiologists are likely to adopt and continue using teleradiology if technical barriers are minimized. Second, the observed gaps in technical competency highlight the need for continuous training programs, hands-on workshops, and technical support to ensure reliable system use and safeguard patient data. Finally, understanding how professional experience contributes to proficiency can guide mentorship programs and allocation of responsibilities to improve workflow efficiency and system adoption across staff of varying experience levels.

Recommendations

Based on the findings, it is recommended that hospitals provide regular technical training and refresher courses on teleradiology platforms to address areas of lower competency, particularly in system troubleshooting, advanced imaging techniques, and data security practices. Hospitals should also consider implementing user-friendly interfaces, technical support services, and standardized protocols to reduce operational errors and enhance usability. Additionally, mentorship programs pairing experienced radiologists with less experienced staff can promote knowledge transfer and strengthen overall technical capacity. These initiatives are expected to improve both the adoption and effective use of teleradiology systems in private hospital settings.

Future Research Directions

Future studies could explore the impact of teleradiology on diagnostic accuracy, reporting speed, and patient outcomes in both private and public hospitals. Longitudinal research may examine how technical competencies evolve over time with continued use of teleradiology platforms. Comparative studies across hospitals with varying infrastructure, resources, and IT support could provide insights into best practices for system implementation and staff training. Finally, integrating objective performance assessments, such as task completion times and error rates, with perception surveys would allow for a more comprehensive evaluation of teleradiology adoption and effectiveness.

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 5 (May 2026)

REFERENCES

Al-Dahery, S., Patel, S., & Jones, M. (2023). Perceptions of teleradiology adoption in healthcare institutions: A systematic review. Journal of Telemedicine and Telecare, 29(4), 210–222. https://doi.org/10.1177/1357633X23100123

AlQudah, A., Abu Haimed, M., & Tawalbeh, L. (2021). Technology acceptance model in healthcare: Predicting adoption of telemedicine. Health Informatics Journal, 27(3), 14604582211023456. https://doi.org/10.1177/14604582211023456

Butzner, M., & Cuffee, Y. (2021). Teleradiology: Improving access and diagnostic efficiency in modern hospitals. Radiology Management, 43(2), 14–21.

Dazai, M. (2023). Advances in teleradiology: Remote interpretation and teleconsultation in clinical practice. Clinical Imaging, 91, 27–34. https://doi.org/10.1016/j.clinimag.2023.01.005

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319–340. https://doi.org/10.2307/249008

Pankhania, M. (2020). Teleradiology during the COVID-19 pandemic: Operational challenges and solutions. British Journal of Radiology, 93(1109), 20200511. https://doi.org/10.1259/bjr.20200511

Rackimuthu, S., Karthikeyan, A., & Ramasamy, M. (2022). The impact of teleradiology on workflow efficiency and patient care outcomes. Journal of Digital Imaging, 35(6), 1405–1413. https://doi.org/10.1007/s10278-022-00624-1

Ranschaert, E. R. (2020). Teleradiology: Current status and future perspectives. Insights into Imaging, 11(1), 1–12. https://doi.org/10.1186/s13244-020-00855-8

Smith, A., Lee, K., & Johnson, R. (2020). Evaluating clinician competency in teleradiology systems. Telemedicine and e-Health, 26(12), 1525–1534. https://doi.org/10.1089/tmj.2019.0243

Worthing, P. (2021). Adoption of healthcare technology: The role of perception and competency. Journal of Medical Systems, 45(9), 87. https://doi.org/10.1007/s10916-021-01773-x