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## INTEGRATION, ADAPTATION OF DIGITAL TOOLS, AND PRACTICE IN PATIENT MANAGEMENT IN DIGITALIZED ENVIRONMENT AMONG RADIOLOGIC TECHNOLOGISTS

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#### ABSTRACT

This study investigated how digital technologies, such as electronic health records (EHRs) and artificial intelligence (AI), changed the job of radiologic technologists. It emphasized the necessity of ongoing professional growth to improve abilities and adjust to this changing environment, despite of obstacles, including insufficient training, budgetary limitations, and cultural resistance. The study examined efficient integration and patient management techniques focusing radiologic technologists in Metro Manila, Philippines. It suggested a professional development program to improve healthcare delivery and increase diagnostic accuracy. The study, used a descriptive correlational approach, looked at how radiologic technologists integrated, adapted, and managed patients in a digital setting. Expert reviewers verified the questionnaire, which evaluated patient management methods, the degree of digital tool integration, and the degree of adaptability to these tools. The instrument's reliability and internal consistency were satisfactory during reliability testing. Using a stratified random sample technique, radiologic technologists at Jose Reves Memorial Medical Center and Philippine Orthopedic Center in Manila were asked to complete a questionnaire created by the researcher to gather primary data. According to the results, the radiologic technologists are very skilled at integrating and modifying digital technologies, and they consistently used efficient patient care techniques. The study did not, however, discover any connection between patient management procedures and adaptation or the degrees of digital tool integration and adaptation. The degree of integration and patient management techniques were significantly correlated. These findings conclude that, even while radiologic technologists use digital technologies efficiently, an action plan was developed and need to implement, monitor and evaluate to sustain integration and adaptation in the digitalized patient management environment.

**Keywords:** Integration, Adaptation Of Digital Tools, Patient Management, Digitalized Environment, Radiologic Technologist.

## **1. INTRODUCTION**

Today's rapidly advancing digital healthcare environment significantly transforms the roles of radiologic technologists. It highlighted the crucial integration and adaptation of digital tools, such as artificial intelligence (AI) and electronic health records (EHRs), to enhance diagnostic accuracy and improve patient care. Radiologic technologists must engage in continuous professional development through training programs, certification courses, and fostering a culture of lifelong learning to stay updated with technological advancements and regulatory requirements.

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The study indicated that AI can potentially improve the quality and efficiency of radiological procedures. However, radiologic technologists must adapt to these digital transformations and navigate the related ethical challenges. Despite the advantages of technological integration, several barriers hinder effective adaptation and patient management. Inadequate training, financial constraints, cultural resistance, and poor communication often obstruct progress. Additionally, data security and confidentiality concerns complicate the integration of digital tools.

Most existing studies on these topics focus on foreign contexts, revealing a lack of literature addressing radiologic technologists' integration and adaptation in the Philippines. This study aimed to explore how technologists in Metro Manila integrate and manage patient care in a digitalized environment. Furthermore, the researcher proposed a professional development program to improve or sustain the skills of radiologic technologists, ultimately contributing to improved diagnostic accuracy, better patient care, and a more effective healthcare system.

## **2. METHODOLOGY**

The descriptive correlational research design was utilized to explore relationships between variables and analyze attitudes and behaviors through numerical data. The primary data were collected via a questionnaire completed by radiologic technologists at Jose Reyes Memorial Medical Center (JRMMC) and Philippine Orthopedic Center (POC). The study had a total of 60 respondents; however, only 57 radiologic technologists were included in the analysis. This was determined using the Raosoft calculator, applying a 95% confidence level and a 5% margin of error. A stratified random sampling technique was used for selection. A self-made questionnaire was utilized in this study and was validated by experts and with the used of Cronbach alpha the questionnaire showed strong reliability and, good internal consistency. After obtaining the necessary approvals, printed questionnaires were distributed and collected from respondents, ensuring confidentiality. Data were then compiled and submitted for statistical analysis.

### **3. RESULTS AND DISCUSSIONS**

Tab	Table 1 Level of Integration in Managing the Patient in A Digitalized Environment									
	Lev	vel of Integration of Digital Tools	Weighte	Verbal		Ra				
	Ind	licators	d Mean	Interpr	etati	nk				
				on						
	1.	I can effectively communicate with patients using	3.47	Very	well	5.5				
		digital platforms.		integrated						
	2.	I can easily access patient data through a unified	3.44	Very	well	7				
		digital platform.		integrated						
	3.	I can communicate by digital tools between various	3.47	Very	well	5.5				
		departments concerning patient care.		integrated						
	4.	I can collaborate with other healthcare professionals	3.53	Very	well	3.5				
		using digital tools.		integrated						
	5.	I can effectively use digital resources to educate	3.54	Very	well	2				
		patients about their procedures.		integrated						

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		integrated		
	well	Verv	3.42	Overall weighted Mean
		integrated		improve patient care strategies.
9	well	Very	3.25	10. I can use data analytics to identify trends and
		integrated		outcomes through data analytics technologies.
8	well	Very	3.26	9. I can track and monitor patient progress and
0	11	integrated	0.04	scheduling patients.
3.5	well	Very	3.53	8. I can utilize digital platforms to conduct virtual
~ ~		integrated		real-time using electronic health records, or EHRs.
1	wen	very	5.50	7. I can nequently update and leview patient data in
1	w.a11	Vom	256	instruments used in patient care.
10	rated	Well-integr	3.19	6. I can resolve technical problems with digital
	rated	Well-integr	3.19	6. I can resolve technical problems with digital

Legend: Very well integrated -4, Well integrated -3, Slightly integrated -2, Not at all integrated -1

Table 1 presents the findings from a study examining the level of integration of digital tools in managing patient care within a digitalized healthcare environment. The highest mean score was attributed to the indicator where the radiologic technologist can frequently update and review patient data in real-time using electronic health records (EHRs), which achieved a score of 3.56. This was followed closely by the indicator, "can effectively use digital resources to educate patients about their procedures," with a mean score of 3.54. Additionally, the indicator concerning collaboration with other healthcare professionals using digital tools also evidenced strong integration, achieving a mean score of 3.53.

However,- specific challenges were identified, such as-resolving technical problems with digital instruments used in patient care, which received a slightly lower mean score of 3.19, indicating a high but less proficient area.

The overall weighted mean of 3.42 categorized the integration as "very well integrated," reflecting the strong proficiency of healthcare professionals in utilizing digital tools for patient management while identifying specific areas that may benefit from further training and support.

#### **Adaptation of Digital Tools in Managing Patients**

Lev Ind	vel of Adaptation of Digital Tools licators	Weigh ted Mean	Verbal Interpreta	tion	Ra nk
1.	I am adapted to transitioning from paper-based to digital tools in patient management	3.61	very adapted	well	2
2.	I feel comfortable learning and using digital tools to manage patient information and perform radiographic procedures.	3.51	very adapted	well	6

Table 2. Level of Adaptation of Digital Tools in Managing Patients

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3.	I can handle technical issues related to digital	3.63	very	well	1
	imaging equipment.		adapted		
1	L can adapt quickly when now digital tools or	2 5 1	work	wall	15
4.	I can adapt quickly when new digital tools of	5.54	very	wen	4.3
	systems are introduced for radiographic procedures.		adapted		
5.	I can manage patients effectively by following the	3.56	very	well	3
	guidelines and protocols in using the digital tools		adanted		
6	Lam appable of using digital data analysis to make	251	uauptea	vva11	15
0.	I am capable of using digital data analysis to make	5.54	very	wen	4.3
	well-informed decisions regarding patient care.		adapted		
7.	I can efficiently adapt digital tools with existing	3.42	very	well	7
	workflows in patient management		adanted		
0	Low ano optime in anoviding foodbook on digital toola	2.26	adapted		0
ð.	I am proactive in providing feedback on digital tools	3.20	very	wen	9
	to improve the effectiveness in patient management.		adapted		
9.	I can maintain patient confidentiality and security	3.19	well adapte	ed	10
	while using digital tools for managing sensitive		1		
	information				
	information.				
10.	I can analyze digital data to make informed	3.28	very	well	8
	decisions about patient care.		adapted		
	Overall weighted Mean	3 16	Verv	well	
	Overall weighten wieall	5.40		vv CII	
			adapted		

Legend: Very well adapted -4, Well adapted -3, Slightly Adapted -2, Not adapted -1

Table 2 highlights the adaptation levels of radiologic technologists regarding digital tools. The highest scoring item was related to the capability to handle technical issues related to digital imaging equipment (mean score: 3.63), followed closely by adapting to transitioning from paper-based to digital tools (mean score: 3.61).

Indicators such as adapting quickly to new digital tools showed confidence among technologists, with a notable mean score of 3.54. The overall weighted mean of 3.46 categorized the adaptation as "very well adapted," demonstrating strong adaptability among professionals in utilizing digital tools for patient management.

## **Practices in Patient Management in a Digitalized Environment**

## **Table 3.Practice in Managing Patients in a Digitalized Environment**

Pra Ind	actice in Managing Patients licators	Weight ed Mean	Verbal Interpretati on	Rank
1.	I retrieve and review patient records through	3.7	Always	2
	digital systems.			
2.	I use digital tools for scheduling patient	3.32	Always	7
	appointments in my daily practice.			
3.	I utilize digital platforms to communicate	3.42	Always	5.5
	with patients regarding their care.			

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				VOI. 0, INO. 02, 2025
4.	I use digital resources to help patients understand their diagnoses and treatment options.	3.42	Always	5.5
5.	I use digital tools to monitor patient's progress.	3.19	Often	10
6.	I employ digital tools to help enhance the quality of patient care.	3.39	Always	8
7.	I send diagnostic and imaging results to patients and doctors digitally.	3.63	Always	3.5
8.	I share patient information with healthcare teams through digital platforms for better coordination.	3.63	Always	3.5
9.	I encourage patients to maintain their health using mobile health ap	3.25	Always	9
10.	I assess the effectiveness of digital tools in increasing patient satisfaction and engagement in their own care.	3.68	Always	1
	Overall weighted Mean	3.46	Always	

Table 3 summarizes practices in managing patients digitally. The highest mean score was found in assessing the effectiveness of digital tools in increasing patient satisfaction and engagement (mean score: 3.68). The utilization of digital systems to retrieve patient records scored slightly lower but still marked the practitioners' commitment to blending technology within their daily practices (mean score: 3.67).

Despite the generally strong practices observed, the indicator regarding encouraging patients to maintain health using mobile health applications highlighted room for improvement, receiving a mean score of 3.25. The overall weighted mean score for practices was 3.46, classified as "always," indicating consistent utilization of digital strategies for patient management. Relationships Between Variables

## **Relationship between Integration and Adaptation**

Table 4. Relationship Between the Level of Integration of Digital Tools in Managing thePatients in a Digitalized Environment and the Level of Adaptation of Digital Tools inManaging the Patients

Variables		Statistical Treatment (Pearson's)	p-value	Decision	Interpretati on
Integration a adaptation	and	r=062 (Negligible correlation)	.510	Failed to reject H0	Not Significant
*Significant @ 0	.05				

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As shown in Table 4, a Pearson's r value of -0.062 was calculated between levels of integration and adaptation, indicating a negligible correlation. The p-value of 0.510 exceeded the significance level of 0.05, concluding that no significant relationship exists between these variables.

Relationship	between	Integration	and	Practices
Relationship	beeneen	megration	unu	1 Iuchees

Table 5. Relationship Between Radiologic Technologists' Level of Adaptation To Digital Tools and Practice in Patient Management in a Digitalized Environment

Variables		Statistical Treatment (Pearson's)	p-value	Decision	Interpretati on
Integration practices	and	r=.204 (low correlation)	.029*	H0 rejected	Significant
*Significant @	0.05				

For the relationship between the level of integration in managing the patients in a digitalized environment and the practices in managing them, Pearson's r value of .204 was obtained, indicating a low correlation. Meanwhile, a probability value of .029, which was lower than the test of significance at .05 showed that there was sufficient statistical evidence to reject the null hypothesis, suggesting a significant relationship between the variables. This means that the greater the respondents' level of integration, the better their practices in managing the patients in a digitalized environment.

This relationship can be explained by several factors highlighted in the literature. First, digital tools can enhance the efficiency and accuracy of patient management by providing immediate access to patient information enabling evidence-based decision-making. Studies have shown that healthcare professionals who utilize digital platforms exhibit greater confidence in their clinical decisions, as access to real-time data can lead to improved communication and coordination among healthcare teams (Bates et al., 2020).

The study's findings support the research of Sabol et al.,(2021), which cited that the use of digital tools has been linked to improved patient outcomes. A systematic review indicated that integrating the electronic health records (EHR) and digital management systems allowed for better tracking of patient progress and adherence to treatment plans, thereby optimizing care. Additionally, the ability to analyze patient data trends through these tools facilitates proactive interventions, which can enhance overall patient management practices. Furthermore, research suggested that radiologic technologists who were more proficient in digital tool integration tend to have more robust training and education in utilizing such technologies, promoting a culture of continuous learning and adaptation in a digitalized environment (Goula et al., 2021). This increased proficiency can lead to more effective management strategies that ultimately benefit patient care.

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#### **Relationship between Adaptation and Practices**

Table 6. Relationship Between Radiologic Technologists' Level of Adaptation and Practice in Patient Management in a Digitalized Environment

Variables		Statistical Treatment (Pearson's)	p-value	Decisio	n		Interpretati on
Adaptation practices	and	r=.001 (negligible correlation)	.997	Failed H0	to	reject	Not Significant
*Significant @							

Table 6 reflects a Pearson's r value of 0.204 between the levels of adaptation and practices, indicating a low yet significant correlation (p-value: 0.029). This result infers that greater tool adaptation-may relate positively to the practices employed in patient management, revealing that as radiologic technologists become more adept at using digital resources, their practices reflect this competence.

The relationship between integration and practices, referenced in Table 5, yielded a Pearson's r value of 0.204 with a p-value of 0.029, leading to the rejection of the null hypothesis and indicating a significant correlation. This suggests that enhanced integration of digital tools translates into improved management practices for patient care.

### **4. CONCLUSION**

Radiologic technologists exhibit considerable capability in integrating and adapting digital tools—significantly enhancing patient management. The study highlights the need for healthcare institutions to invest in ongoing training and development programs, targeting integration and adaptation efforts to boost efficacy in employing digital tools.

Future research should consider longitudinal studies to evaluate the long-term impacts of these integrations on patients' outcomes and overall care efficiency. Addressing areas where adaptation and practices can be refined will benefit individual practitioners and enhance the quality of care provided within the healthcare system.

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