The Impact Of New Innovative Technology On The Accuracy And Efficiency Of Diagnostic Radiology Techniques: A Systematic Review

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Abstract

Background: The use of new innovative technologies in diagnostic radiology has the potential to completely transform the way healthcare is provided, enhance patient outcomes, and maximize the use of available resources. Nonetheless, there is still uncertainty around the diagnostic accuracy and efficiency of these technologies, which calls for a thorough review and research. **Aims**: The aim of this systematic review is to investigate how new and novel technologies affect the precision and effectiveness of diagnostic radiology procedures. The study specifically aims to evaluate the new innovative technology, diagnostic precision, investigate the effects of technology integration in health

community, and clarify the revolutionary potential of artificial intelligence (AI) in radiology.

Method: Up to 2023, a thorough search was carried out in databases, including Medline and EMBASE. Included were studies on the efficacy and accuracy of new, cutting-edge diagnostic radiological devices. Methodologies, findings, and conclusions were combined and examined to offer a thorough understanding of how technology affects diagnostic radiology procedures.

Results: Different medical imaging disciplines have differing degrees of diagnostic accuracy, according to our review. Though there are some worries about overestimating diagnostic precision, DL algorithms showed encouraging outcomes in pathology diagnosis in medical imaging. Benefits from technology integration in community health nursing include enhanced care coordination and patient participation. Furthermore, AI and radiologists working together in diagnostic radiology has the potential to revolutionize patient outcomes and resource efficiency.

Conclusion: The accuracy and efficiency of diagnostic radiology will be greatly impacted by the incorporation of new and creative technology. Although encouraging, issues like the overestimation of diagnostic accuracy and the requirement for standardized criteria call for more investigation and advancement. Our results highlight the need for strong implementation and assessment plans in order to fully use technology's potential to advance diagnostic radiology procedures.

Keywords: Radiology, Innovative Technology, Artificial Intelligence, Community Health, Diagnostic Accuracy, Efficiency, Systematic Review.

Introduction

Accuracy and efficiency are significantly affected by the incorporation of new and innovative technologies in the dynamic field of diagnostic radiology. Modern medical imaging techniques provide increased resolution, reliability, and safety, as Hussain et al. (2022) rightly point out, ushering in a new era of precision medicine. These developments offer improved sensitivity, specificity, and resolution in the diagnosis of complicated patient diseases, ranging from simultaneous PET/MRI to 3D USCT and PET/CT hybrids. Furthermore, Alruwaili et al. (2023) highlight the revolutionary potential of technology integration, especially in

Saudi Arabian community health nursing, where advantages include enhanced patient involvement and more efficient care coordination. (Hussain et al., 2022)

As elaborated by Walker (2023), the influence of innovation and technology in the medical profession has completely changed healthcare systems, particularly with regard to changes in medical imaging. Similarly, Kaisanesh (2023) emphasizes how artificial intelligence (AI) plays a critical role in radiology because it can work with radiologists to optimize medical imaging procedures, which improves patient outcomes and makes the most use of available resources.

The use of technology in the field of health has enormous beneficial aspects, and leads to significant enhancement to patient engagement, streamline care and coordination (Alruwaili, et al. 2023). Furthermore, Al.Ali et al in 2022 elaborated that effectiveness of technology related to healthcare sector. The explored that effect of technology on healthcare system on the way that how it is initiated (Al.Ali et al., 2022).

Therefore, to transform health care community, the new emerging technologies, the Artificial intelligence has a significant role in offering opportunities, recognizing bias, and improvement of disease management and boasts patient management (Matmi et al., 2023). Similarly, Shahbal et al. in 2022 determined that artificial intelligence is a great innovating in healthcare. According to the modern requirements, it is more fruitful and enhanced the healthcare in respect to modern trends and demands, and recommended to manage challenges in medicine, public health and pharmacy.

Hence, the significance of a multimodality approach in diagnostic imaging is emphasized by Steyerova and Burgetova (2022), who support cooperative evaluation across several imaging modalities and disciplines. Their results demonstrate how important it is for interdisciplinary teams to collaborate in order to fully utilize imaging technology in order to enhance patient survival and diagnosis. Chandramohan et al. (2023) have identified the potential benefits of integrating tele radiology with artificial intelligence (AI) and mobile digital imaging equipment as a means of mitigating the shortage of radiologists while also improving population screening and emergency care programs.

Artificial intelligence may help with medical imaging diagnosis in a number of ways, as suggested by Srivastav et al. (2023). These benefits include reduced interpretation mistakes,

increased workflow efficiency, and better diagnostic accuracy. However, it is also critical to recognize and deal with the drawbacks and difficulties that come with integrating AI, especially in light of the overestimation of diagnostic accuracy and the requirement for uniform standards to guarantee thorough testing and application. Our goal in doing this systematic review is to help you navigate these difficulties by offering a thorough overview of how new and novel technologies have affected diagnostic radiology practices. We also hope to identify areas that need additional study and development in order to improve patient care and clinical results.

The goal of present study in conducting this systematic review is to thoroughly investigate how new and novel technologies affect the precision and effectiveness of diagnostic radiology methods. We want to clarify the significance of these developments for clinical practice, patient care, and the larger healthcare environment by combining data from other research. We want to offer significant insights into the transformational potential of technology in diagnostic radiography by a thorough examination of methods, findings, and consequences.

Method

Research objectives
1) To thoroughly examine and evaluate research on the diagnostic accuracy of modern technology in medical imaging, evaluating their effectiveness in a range of specializations and modalities.
2) To conduct a thorough literature analysis in order to examine the impact of integrating technology, such as artificial intelligence (AI), on community health nursing practices. The primary areas of attention will be patient engagement, care coordination, and overall healthcare outcomes.
3) To investigate the effects of AI and radiologist cooperation on diagnostic radiological methods, investigating the ways in which this alliance affects precision, effectiveness, and the use of resources in clinical contexts.
4) To determine, evaluate, and provide solutions for the problems arising from the use of new, cutting-edge technology in diagnostic radiology in order to maximize the efficiency and dependability of diagnostic methods.

Research questions

1) To what extent do modern technologies identify disease in medical imaging across disciplines with respect to diagnostic accuracy?

2) What effects will technology integration, especially artificial intelligence (AI), have on community health nursing practices? Specifically, how will it affect care coordination and patient engagement?

3) What effects does AI and radiologists working together have on the precision and effectiveness of diagnostic radiology procedures, and what are the possible advantages for patient outcomes and resource use?

4) What obstacles and constraints come with incorporating new, cutting-edge technology into diagnostic radiology, and how may they be overcome to maximize the efficiency and dependability of diagnostic methods?

Literature search strategy: A methodical approach to searching was used in order to guarantee a thorough examination of pertinent material. Using a mix of keywords and technical phrases pertaining to diagnostic radiology, cutting-edge technology, deep learning algorithms, artificial intelligence, community health nursing, and diagnostic accuracy, databases such as Medline and EMBASE were queried until December 2023. To find further sources, the reference lists of the included research and pertinent review articles were manually searched.

Table 1: Syntax search

Syntax 1	"New innovation technology"
Syntax 2	" diagnostic radiology techniques"

Table 2: Statistics from the Data Base

No	Database	Syntax	Year	No of Researches
1	Medline	Syntax 1	2021 to 2023	
		Syntax 2		9
2	Google Scholar	Syntax 1		8
		Syntax 2		
3	EMBASE	Syntax 1		
		Syntax 2		6
4	Elsevier	Syntax 1		
		Syntax 2`		4

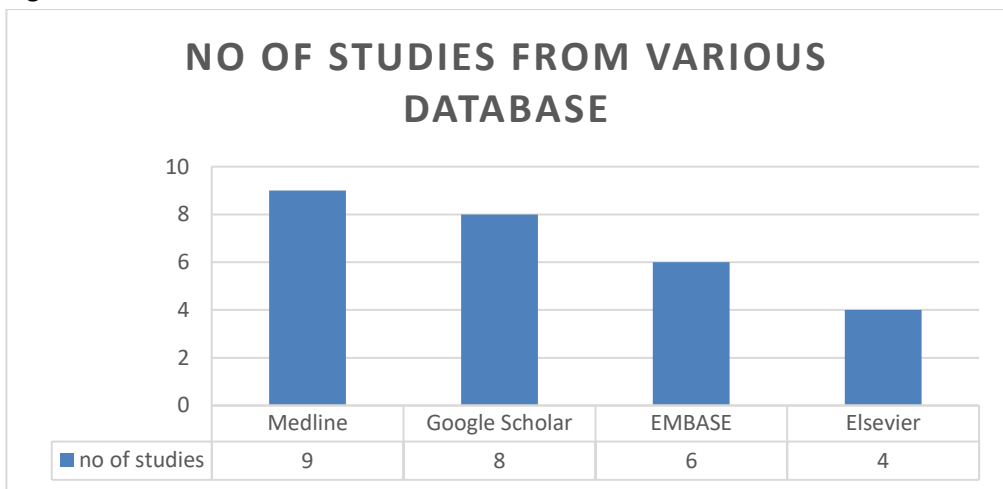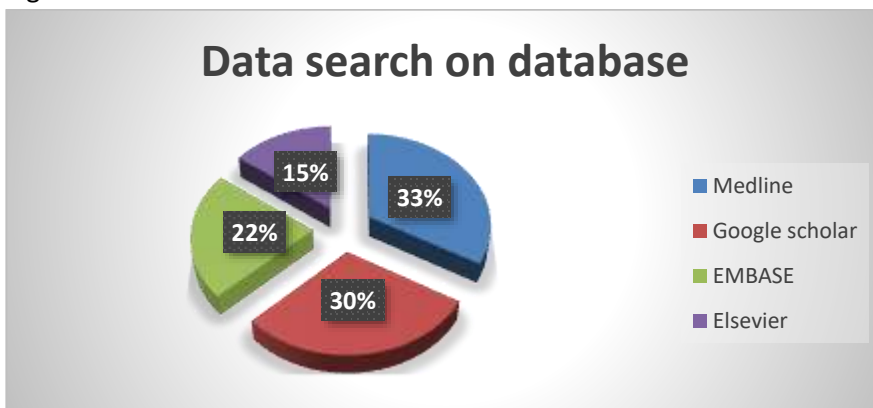Figure 1: No of studies from various databases

Figure 2: Data search on database

Inclusion and exclusion criteria

Inclusion criteria
1) Research articles published in journals with peer review.
2) Research summarizing how new technologies have affected diagnostic radiology methods.
3) Research on artificial intelligence, deep learning algorithms, and other technical developments in diagnostic radiology.
4) Research looking on the use of technology in community health nursing.
5) Research looking into AI and radiologists working together in diagnostic radiology.
6) Studies that shed light on the efficiency, advantages, drawbacks, and consequences of novel technologies in diagnostic radiography.

Exclusion criteria
1) Studies that do not pertain to the study topics include those that concentrate on clinical trials or non-human participants.
2) Research not discussing how new technologies affect diagnostic radiology methods.
3) Studies that only address non-technological elements of radiology diagnosis.
4) Research that do not offer enough information on the advantages, difficulties, implications, efficiency, or accuracy of diagnosis in diagnostic radiography.
5) Research not released in English.

Quality assessment: The quality assessment of the included studies was evaluated based on predetermined standards that were suitable for each article's research design. The clarity of the study objectives, suitability of the search approach, appropriateness of the inclusion criteria, and thoroughness of the data synthesis will be the basis for evaluating the methodological quality and risk of bias for review articles. Quality evaluation was used to concentrate on elements including research design, sample size, blinding, control of confounding variables, and adequate statistical analysis for both observational and experimental investigations. Studies with significant risk of bias or methodological flaws were not included in the final analysis; their shortcomings will be covered in the review. The purpose of this

quality evaluation procedure is to guarantee the authenticity and dependability of the results presented in the review.

Table 3: Assessment of the literature quality matrix

S. No	Author	Are the selection of studies described appropriately	Has the literature covered all relevant studies	Does the method section described	Were findings clearly described?	Quality rating
1	Hussain et al.	Yes	Yes	Yes	Yes	**High**
2	Alruwaili, et al.	**Yes**	Yes	Yes	Yes	**High**
3	walker, J. (2023)	Yes	Yes	Yes	Yes	**High**
4	Kaisanesh, J. (2023).	**Yes**	Yes	Yes	Yes	**High**
5	Steyerova & Burgetova,	Yes	Yes	Yes	Yes	**High**
6	Chandramohan, et al	Yes	Yes	Yes	Yes	**High**
7	Srivastav, et al	Yes	Yes	Yes	Yes	**High**
8	Aggarwal, et al.	**Yes**	Yes	Yes	Yes	**High**
9	Ahmad, T	Yes	Yes	Yes	Yes	**High**
10	van et al.	Yes	Yes	Yes	Yes	**High**

11		Yes		Yes	Yes	high
	Pinto-Coelho		Yes			

Study selection

To find relevent papers for the systematic review, the research selection method required many steps. First, duplicates were eliminated and all studies found through the database search were imported. Studies that blatantly do not fit the qualifying requirements were thus eliminated at this point. After the first screening, the whole texts of papers that could be of interest were obtained and evaluated independently. To ensure accountability and openness, the research selection procedure was recorded using a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram. The final systematic review will include only those papers that satisfy all inclusion criteria and are judged to be of sufficient quality.

Table 4: Selected Studies for SR (Systematic Review

S. No	Author	Research	Year
1	Hussain et al.	Modern Diagnostic Imaging Technique Applications and Risk Factors in the Medical Field: A Review	2022
2	Alruwaili, et al.	Integrating Technology and Innovation In Community Health Nursing Practice In Saudi Arabia; A Systematic Review	2023
3	Walker, j.	Advancements in Radiology A Comprehensive Review of Current Techniques and Emerging Technologies.	2023
4	Kaisanesh, J. (2023).	Artificial Intelligence in Radiology: Enhancing Diagnostic Accuracy	2023
5	Steyerova & Burgetova,	Current imaging techniques and impact on diagnosis and survival —a narrative review	2022
6	Chandramohan, et al	Tele radiology and technology innovations in radiology: status in India and its role in increasing access to primary health care.	2023
7	Srivastav, et al	Chatgpt in radiology: The advantages and limitations of artificial intelligence for medical imaging diagnosis	2023
8	Aggarwal, et al.	Diagnostic accuracy of deep learning in medical imaging: a systematic review and meta-analysis.	2021

9	Ahmad, T.	Emerging Technologies: Radiology Advancements in Critical Care Diagnostics.	2023
10	van et al.		2021
		How does artificial intelligence in radiology improve efficiency and health outcomes?.	
11	Pinto-Coelho	How Artificial Intelligence Is Shaping Medical Imaging Technology: A Survey of Innovations and Applications	2023

Results

Study Database: Researcher searched databases were Medline, Google scholar, EMBASE and Elsevier for the relevant researches and articles. These databases were selected due to their extensive coverage of academic literature in the innovation technology and radiology.

Title and abstract screening: After retrieving the initial set of articles was extracted and collected from the databases, a careful screening procedure was carried out using the article titles and abstracts. Relevant papers were eliminated from the research, and those that seemed to fit the inclusion criteria were chosen for further evaluation.
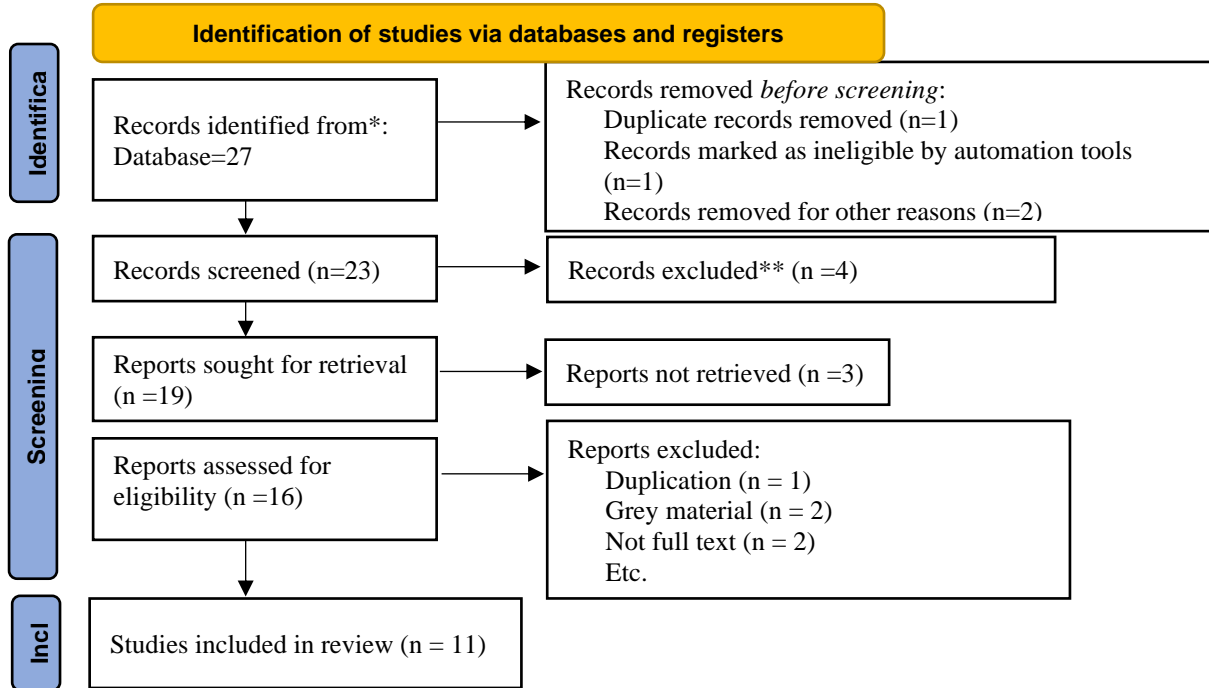
Full-Text Assessment: The entire texts of the chosen papers from the title and abstract screening stages were thoroughly assessed. That was analyzed and different parts of each article such as methodology, findings, and discussion sections to ascertain whether they should be included in the research synthesis. The final analysis contained just the articles that satisfied the predetermined inclusion criteria are not.

PRISMA Flowchart: The method of selecting studies was demonstrated using a flowchart based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The number of studies that were found, examined, evaluated for eligibility, and included in the final analysis is shown visually in the flowchart. The legitimacy and repeatability of the research selection procedure are guaranteed by this open reporting.

Identification of studies via databases and registers: To locate relevant studies, registration and database searches were combined with extensive database searches. Medline, Google scholar, EMBASE and Elsevier were the primary databases utilized due to their extensive coverage of scholarly literature in the nursing and healthcare domains. The search strategy included a

combination of keywords and search terms related to innovation, emerging technologies, and radiology.

Table 5: Identification of Studies via Database

Identification of studies via databases and registers

Identifica

Records identified from*:
Database=27

→ Records removed *before screening*:
   Duplicate records removed (n=1)
   Records marked as ineligible by automation tools (n=1)
   Records removed for other reasons (n=2)

Records screened (n=23) → Records excluded** (n =4)

Screening

Reports sought for retrieval (n =19) → Reports not retrieved (n =3)

Reports assessed for eligibility (n =16) → Reports excluded:
   Duplication (n = 1)
   Grey material (n = 2)
   Not full text (n = 2)
   Etc.

Incl

Studies included in review (n = 11)

Data extraction: Data extraction was done in order to methodically get important information from each included study. The variables of interest were outlined in a standardized data extraction form that was created based on the inclusion criteria and study goals. The retrieved data covered a wide range of topics, such as study features, participant demographics, intervention specifics, outcomes that were measured, and findings that were pertinent to the research objectives. Furthermore, information about each study's quality evaluation was also included.

Table 6: Research matrix

Author, Year	Aim of study	Methodology	Sample	Setting	Result
Hussain, S., Mubeen, I., Ullah, N., Shah, S. S. U. D., Khan, B. A., Zahoor, M., ... & Sultan, M. A. (2022).	To explain modern diagnostic imaging techniques, its applications and risk factors in the medical field.	A review article	Review article	Review article	Modern medical imaging techniques that offer high resolution, improved reliability, and safety for diagnosing, treating, and managing complicated patient problems include simultaneous PET/MRI, 3D USCT, and PET/CT hybrid. These methods guarantee the development of fresh, precise imaging instruments with increased sensitivity, specificity, and resolution.
Alruwaili, M. A., Ali, R. M., Shahbal, S., Alotaibi, S. G.,	This study examines telehealth, EHRs, mHealth, and education in	Literature review	Literature review	Literature review	There are several benefits to integrating technology into community health nursing

Althiyabi, N. A., Aldosari, M. K., ... & Alharthi, F. M. (2023).	detail in order to determine the effects of technology integration in community health nursing in Saudi Arabia.				practice in Saudi Arabia, including improved patient involvement, more efficient care coordination, and
Walker, j. (2023).	To find out the **Advancements in Radiology**	Literature review	Literature review	Department of Radiology, Australia	There is discussion of the possible difficulties and moral issues surrounding the use of these new technology. All things considered, radiologists, medical professionals, and researchers who want to keep up with the most recent advancements in the area will find great value in this study piece.
Kaisanesh, J. (2023).	explores the integration of AI into radiology practices, focusing on its potential	Experimental research	Not applicable	Department of public health, university of hua	AI and radiologists working together can transform medical imaging,

	to enhance diagnostic accuracy.				enhance patient outcomes, and maximise the use of available resources.
Steyerova, P., & Burgetova, A. (2022).	To elaborate the impacts of imagining techniques on diagnosis and survival.	Review article	Review article1	Review article	The study highlight the importance of the multimodality approach, which includes a combined evaluation of all imaging modalities and multidisciplinary teamwork with close collaboration of different medical specialties; practically illustrated examples are provided in a series of clinical scenarios.
Chandramohan, A., Krothapalli, V., Augustin, A., Kandagaddala, M., Thomas, H. M., Sudarsanam, T. D., ...	intended to map the instruments for technology now in use in order to enhance primary healthcare access to imaging; to	Scoping review	43 original articles and 52 non-academic materials were finally reviewed.	Review article	Research indicates that the integration of teleradiology with artificial intelligence and mobile digital imaging devices may help alleviate the scarcity of radiologists and

& Kalyanpur, A. (2023).	identify the knowledge gaps and obstacles that need to be filled in order for technology solutions to be widely adopted.				improve population screening and emergency care initiatives.
Srivastav, S., Chandrakar, R., Gupta, S., Babhulkar, V., Agrawal, S., Jaiswal, A., ... & Wanjari, M. B. (2023).	To find out the Advantages and Limitations of Artificial Intelligence for Medical Imaging Diagnosis	Review article	Review article	Review article	By decreasing interpretation mistakes and variability and increasing workflow efficiency, ChatGPT has demonstrated considerable potential in improving radiological diagnosis accuracy and efficiency.
Aggarwal, R., Sounderajah, V., Martin, G., Ting, D. S., Karthikesalingam, A., King, D., ... & Darzi, A. (2021).	to assess the DL algorithms' diagnostic accuracy in identifying pathology in medical imaging.	Review article	503 articles were included in the study	Review article	The findings explained that the diagnostic precision of DL algorithms on medical imaging to be overestimated. The creation of EQUATOR standards specifically for artificial intelligence in

					particular, STARD is urgently needed to offer direction on important matters in this area.
Ahmad, T. (2023). Emerging Technologies: Radiology Advancements in Critical Care Diagnostics. Frontier in Medical & Health Research, 1(1), 27-35.	To explore the emerging technologies, radiology advancement in critical care diagnosis	Experimental design	Not applicable	Not applicable	The researcher emphasise the significant changes and future possibilities of radiology in influencing critical care diagnosis by exploring the integration of artificial intelligence, technical breakthroughs in imaging modalities, and the consequences for patient care.
van Leeuwen, K. G., de Rooij, M., Schalekamp, S., van Ginneken, B., & Rutten, M. J. (2021)	To findout the way and extent that hwo artificial intelligence in radiology improve efficiency and health consequences	Quantitative research	470 undergraduate students	China	conclude that little is known about how AI will affect clinical practice and that the market is still developing. It is anticipated that increased real-world observation of

					AI in clinical practice will help assess the technology's worth and facilitate well-informed choices regarding its development, acquisition, and payment.
Pinto-Coelho, L. (2023).	To find out the impacts of artificial intelligence in medical imaging.	Qualitative analyses	147 participants	North Dakota State University).	The researcher concluded that the way that it is certain that AI will continue to have a significant and positive impact on healthcare in the future when cutting-edge AI techniques are combined with their real-world applications.

Data synthesis

Data synthesis entails the integration and interpretation of information from individual investigations. Depending on the goals and nature of the data, a variety of methods, including narrative synthesis, theme analysis, and meta-analysis, was used. By use of data synthesis, investigators seek to condense the combined information from several investigations into logical and significant conclusions that enhance comprehension of the research subject. Iteratively evaluating each study's quality and applicability, looking for patterns or contradictions, and formulating broad conclusions or ramifications are all part of this process.

Table 7: The following sub-themes have been observed among the studies, including in the systematic review.

No	Themes	Sub-themes
1	Impact of new innovative technology on the accuracy and efficiency of diagnostic radiology techniques	Patient safety
		Medical field
		Workload management
		Technologies integration in neuroimaging
2	Radiology and the emergence of new technology	Artificial intelligence
		Emerging technology

Discussion

Modern diagnostic imaging techniques, like simultaneous PET/MRI, 3D USCT, and PET/CT hybrid, have shown promising results in improving the modalities' resolution, safety, and reliability (Hussain et al., 2022). Additionally, using artificial intelligence in radiology as Kaisanesh (2023) has highlighted that promise in improving diagnostic accuracy and efficiency by processing large amounts of data and identifying patterns that may be invisible to the human eye. Hence, we achieved 1st objective of the study that "to thoroughly examine and evaluate research on the diagnostic accuracy of modern technology in medical imaging evaluating their effectiveness in a range of specializations and modalities". Similarly, AI algorithm have shown considerable promise in lowering variability, misinterpretation errors, and workflow inefficiencies, ultimately improving the accuracy and efficiency of radiological diagnosis (Srivastav et al., 2023).

Furthermore, the inclusion of research on AI's potential applications in dental imaging (Ahmad et al., 2023) highlights the revolutionizing power of AI technologies across a range of healthcare fields. So, 2ned objective of the study is achieved. Similarly, AI has the ability to significantly improve patient care and advance the field of dentistry by increasing timesavings, accuracy, and efficiency in dental practices. Furthermore, Pinto-Coelho's (2023) analysis of the effects of AI in medical imaging emphasizes the ongoing benefits of AI technologies for healthcare, especially when cutting-edge AI methods are integrated with practical uses. Hence we reached our 3rd objective of the study and achieved it.

However, it is critical to recognize the restrictions and difficulties the systematic study pointed up. The results may have been more heterogeneous because to differences in technique,

language, and outcome measures between research, which might have resulted in an overestimation of the effectiveness and diagnostic accuracy of cutting-edge radiological technology. Additionally, the necessity of standardized guidelines emphasizes the significance of fixing methodological discrepancies and improving reporting standards in future research, as recommended by Aggarwal et al. (2021) with regard to the introduction of EQUATOR standards particularly for artificial intelligence.

Overall, the results point to encouraging developments in diagnostic radiology techniques made possible by cutting-edge technologies, but more research is necessary to resolve methodological issues, standardize reporting procedures, and confirm the effectiveness and accuracy of these technologies in clinical settings. Working together, researchers, medical practitioners, and legislators can fully use cutting-edge radiological technology and enhance patient outcomes in the era of precision medicine.

Limitation & Implications

Limitations
One possible source of selection bias is the use of specific inclusion criteria, which may have excluded relevant research. Another possible source of bias is the dependence on published literature, which may favor studies with statistically significant results. Rapid advancement of technology may have rendered some studies outdated, affecting the relevance of findings. Variability in study designs, methodologies, and outcome measures across included studies may limit comparability and generalizability.

Implications
Present study highlights fields for further research, especially for standardized reporting guidelines and methodologies. Results and finding can give information about clinical decision-making and resource allocation. Present study contributes to advancing the field of radiology and improving patient consequences in accuracy medicine. Except from that, it gives future research directions and healthcare policies related to innovative technologies.

Recommendations

To improve comparability and reproducibility among research, promote the creation and implementation of standardized reporting criteria and techniques. It also encourages multidisciplinary cooperation between scientists, physicians, legislators, and tech developers to tackle the many difficulties involved in incorporating cutting-edge technologies into radiological practice. It also guarantees that healthcare personnel are competent in utilizing new technology in an efficient and secure manner, offer them thorough training programs. It will encourage longitudinal research in order to evaluate the long-term effects of cutting-edge technology on patient outcomes, diagnostic precision, and healthcare delivery.

What this article is adding in existing literature?
This article adds to the literature already in existence:
- Providing a comprehensive overview of the present status of technology integration in radiology by summarizing a wide variety of studies carried out in different contexts and specializations.
- Identifying important patterns, obstacles, and chances related to the use of cutting-edge technology, which will assist in guiding future paths for clinical research and practice.
- Supplying information on the possible advantages and drawbacks of various technology strategies, aiding legislators and healthcare professionals in their decision-making.
- Pointing up areas of uncertainty and needing further research to encourage future studies aimed at resolving important open-ended concerns in the field.
- Promoting best practices and patient-centered care while highlighting the significance of standardization, cooperation, and ethical concerns in the appropriate application of emerging technology.

Conclusion
Present study gives a thorough summary of how new; innovative technology affects the precision and effectiveness of diagnostic radiological procedures. The researcher discovered important trends, obstacles, and possibilities in the incorporation of technology into radiological practice by synthesizing a wide variety

of research. The results highlight how emerging technology, such as artificial intelligence and advanced imaging modalities have the power to transform diagnostic procedures and enhance patient outcomes. To guarantee the ethical and responsible application of new technologies, we also acknowledge the necessity of strong regulatory monitoring, multidisciplinary cooperation, and uniform reporting standards. By considering these factors and placing a high priority on patient-centered care, healthcare stakeholders may fully use technology to progress the area of radiology and improve the standard of treatment.

References

Aggarwal, R., Sounderajah, V., Martin, G., Ting, D. S., Karthikesalingam, A., King, D., ... & Darzi, A. (2021). Diagnostic accuracy of deep learning in medical imaging: a systematic review and meta-analysis. NPJ digital medicine, 4(1), 65.

Ahmad, T. (2023). Emerging Technologies: Radiology Advancements in Critical Care Diagnostics. Frontier in Medical & Health Research, 1(1), 27-35.

Al Ali, Y.T., Al Qahtani, A. A., Assiri, H. Y., Alyahya, A. M., Al Alkharsh, F. S., Assiri, A. Y., … & Alasiri, Y.H.(2022). Effectiveness of technology on organizational development and services in the Saudi health sector. Journal of pharmaceutical negative results, 2144-2155.

Alruwaili, M. A., Ali, R. M., Shahbal, S., Alotaibi, S. G., Althiyabi, N. A., Aldosari, M. K., ... & Alharthi, F. M. (2023). Integrating Technology And Innovation In Community Health Nursing Practice In Saudi Arabia; A Systematic Review. Journal of Namibian Studies: History Politics Culture, 35, 2829-2852.

Chandramohan, A., Krothapalli, V., Augustin, A., Kandagaddala, M., Thomas, H. M., Sudarsanam, T. D., ... & Kalyanpur, A. (2023). Teleradiology and technology innovations in radiology: status in India and its role in increasing access to primary health care. The Lancet Regional Health-Southeast Asia.

Hussain, S., Mubeen, I., Ullah, N., Shah, S. S. U. D., Khan, B. A., Zahoor, M., ... & Sultan, M. A. (2022). Modern diagnostic imaging technique applications and risk factors in the medical field: A review. BioMed Research International, 2022.

Kaisanesh, J. (2023). Artificial Intelligence in Radiology: Enhancing Diagnostic Accuracy.

Matmi, M. M., Alnonazi, A. E., Sulaimani, A. M., Alkhulagi, F. M., Asiri, A. M., Alayli, M. H., …. & Shahbal, S. (2023). Application of Artificial intelligence in community-Based primary health care: systematic review. Journal of Namibian studies: history politics Cultures, 35, 1269-1292.

Pinto-Coelho, L. (2023). How Artificial Intelligence Is Shaping Medical Imaging Technology: A Survey of Innovations and Applications. Bioengineering, 10(12), 1435.

Rajhi, F. A., Tohary, M. M. N., Mahzari, A. M. A., Shayani, A. Y., Kariri, K. M., Rajhi, M. A., …. & Kriri, M. M. (2020). Artificial intelligence; as an innovative effective instrument in healthcare; telemedicine, public health, and pharmacy – A systematic Review. Artificial intelligence, 41(12-2022).

Srivastav, S., Chandrakar, R., Gupta, S., Babhulkar, V., Agrawal, S., Jaiswal, A., … & Wanjari, M. B. (2023). ChatGPT in radiology: The advantages and limitations of artificial intelligence for medical imaging diagnosis. Cureus 15, e41435.

Steyerova, P., & Burgetova, A. (2022). Current imaging techniques and impact on diagnosis and survival—a narrative review. Ann Breast Surg, 6(3), 1-13.

van Leeuwen, K. G., de Rooij, M., Schalekamp, S., van Ginneken, B., & Rutten, M. J. (2021). How does artificial intelligence in radiology improve efficiency and health outcomes?. Pediatric Radiology, 1-7.

Walker, j. (2023). Advancements in Radiology A Comprehensive Review of Current Techniques and Emerging Technologies. Case Report - Imaging in Medicine (2023) Volume 15, Issue 4