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ASSESSING PATIENT'S SAFETY OF RADIOLOGY DEPARTMENT – AN ESSENTIAL COMPONENT OF PATIENT CARE

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Abstract

Radiology is an indispensable substrate of present day Healthcare, and its expansion is rampant. The division of Radiology Imaging, is subjected to throw its spotlights in keeping the patient care and safety with highest probable benchmarks, that commences from the minute of a supplication being demanded, all along the process of routine, until the complete detail of the imaging be furnished. As such, this inevitable need towards patient safety unlashes this paper to summarize the values through which an organisation is checked of its safety protocols, with alternate elevated options if any defects found in the present system, that further extends by charting the satisfactory level of patients who assessed the service priorly for the betterment of future patients. The study deals with quantitative accumulation of source, by spreading out to patients a structured questionnaire, using convenience sampling method. In conclusion, patient safety in radiology is a dynamite issue that encapsulates Progressive research, Inter-dependence, and ceaseless up gradation.

Keywords: Diagnostic Radiology, Patient safety, Patient Satisfaction.

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INTRODUCTION:

Contemporarily, Healthcare has secured its rank as one of India's renounced high level sectors (in terms of revenue and employment).The industry itself is a abode of plethora of gateways in the provision of medical supplies, patient services, and facilities, thereby inclusive areas of interests like Hospitals, Clinics, Chemist shops, Medical tool manufacturers, Pharmaceutical companies, Secured policy providers, and other fellow organizations, exerting its heavy hands to propagate civil wellness, ensuring, yielding the same to every person who lacks or in immediate or prolonged need as its prime significance.

Providence of reliable safe care in a complicated, time-pursued swift dynamic environment is one among many noticeable hardships the field is subjected to. The radiology department uses extra modern tech-instruments that engrosses sound interpersonal auditory skills between varieties of healthcare setups in accordance with numerous care-taker flow. Diagnostic radiology is a branch of radiology department that uses various imaging technologies, such as X-rays, ultrasound, magnetic resonance imaging (MRI), computed tomography (CT), and nuclear medicine, to visualize the internal structures of the human body. These imaging technologies plays a crucial part in distinguishing and tending to differing medical conditions, from fractures and tumors to cardiovascular infirmities and neurological malfunctions. Over decades, it shall be justifiable to say there's been a noteworthy progress rather than a depleting retreat, a clear breakthrough by Technological exaltation, software, visual imagery methods whose usage are Boundless. However, it would be irrational to think it's a field of flawlessness and spotlessness when exposure to radiation linked deeds has got its dooms, howbeit the amount is always stay put in the safe line, with no intention of deliberate harm imposed over none.

The sole mark of radiographers and radiologists focusses on endorsing simultaneous contribution of wellness and defense to the patients. With the potential havocs in radiology being multidimensional, the culmination of patient protection aims on bulwarking trivial threats from any of the progressive diagnostic steps that accomplice with strategies sketched out or movements undertaken. Errors are prone either in managing the patients and possession of imaging, or in image reporting that turns hazardous. The familiar faults either by human error or by system malfunction includes mismatched Patient Identity, chosen site, or side of imaging erred, perception or interpretation of imaging unintellectual , technician/radiologist's lack of knowledge about the patient in their gestation period or other related concerns. Hence, quality of exercise, administration, crowd working and ceaseless training about radiology hassles and their precautionary standards are indispensable for all radiology personnel, to upgrade the system quality thereby issuing radiology defense.

REVIEW LITERATURE:

(Bruno & Nagy, 2014)First and foremost, any quality and safety initiative should focus on creating a "safety culture" within the workplace. This entails teaching employees to view issues from a "systems lens" and to stop pointing fingers and criticizing one another when mistakes are made by humans [3]. (Donnelly et al., 2010) Horizontal interventions - such as operating rounds with radiology leadership, safety coach programs, training in mistake avoidance, and a program for communicating lessons learned—can successfully enhance radiology's safety culture and performance [5]. (European Society of Radiology (ESR, 2019) Potential risks under a range of categories are taken into account and described, ranging from less-obvious subjects like data privacy and miscommunication, to direct effects of

radiation exposure, through the use of drugs and contrast. The ESR and EFRS work to keep safety concerns at the center of subsequent academic, resourcing, & development plans. Integrating patient safety into curriculum can help advance toward a patient safety culture and a system of safety [6].(Larson et al., 2015) Patient safety's most crucial components are also its least tangible ones so building systems and a culture will be essential to sustaining and raising safety standards as radiology continues to operate in a more complicated healthcare setting [9].

(Lee et al., 2016)Continuous staff training in patient administration, screening, and evaluation is essential in light of ongoing technology innovation in order to enhance patient safety and provide better treatment [10]. (Tourgeman-Bashkin et al., 2013) Proactive methods, such as action research, can be used to improve patient safety because they empower workers, foster a culture of safety, and foster open communication, all of which have a positive impact on patient safety [14]. (Wallin et al., 2019) Risks for patient safety accidents can be exacerbated by a lack of information and communication, both within and outside. It should be noted that damage isn't always brought on by what happens in the radiology department [15]. (Zygmont et al., 2017) Effective IT infrastructure, training opportunities, and management support of just cultures are critical components for advancing quality and safety research. In the near future, radiology will place a lot of emphasis on advancing current performance measurements and discovering new indicators in ways that enhance patient care and results [17].

OBJECTIVES:

The objectives of the study aimed to be covered are to estimate the safety standards against the universal or well – defined ones, ensured to the patients in the radiology department, thereby voicing out the dents and hollows if found, as enhanced up gradation plans towards patient care can be advocated. Followed by, a trial of patient contentment aftermath their concerned diagnostics with the on – set values.

LIMITATIONS:

With certain levels of limitations affecting the cent efficiency of the study, rooting up of pros to sabotage these cons are letting out its branches. The major limitations found to be Time – tied environment obstructing a comprehensive research, while the study is kept at bay within Chennai and its suburbs as its undertaken in a particular regional – bound diagnostic centres / hospitals. The next be, Exclusive to Indian residents alone. To top it all, a crucial lag marks to be the favorite responses of the patients that impacts the outputs through differing insights and mind – thoughts.

RESEARCH METHODOLOGY:

The systematic enquiry of study undertaken founded on a quantitative perspective in which the primary data is gathered from dates 15th February to 6th March, by disseminating the structured questionnaires virtually to the Post - Diagnostic patients, their safety securing calibrations, in the domain of radiology, to which a review literature is applied also. The questionnaire framed is branched to two, the former manifesting, demographic traits of the involved, while the latter is based on scrutinizing contemporary safety strongholds, with differing scales and the one handled here is Likert. With the incorporation of convenience sampling ideology for grasping the Datum, weighing a sum of 180 samples of input, has instated tools like Descriptive statistics (Frequency distribution and percentage), Chi- square and Correlation analysis, and SPSS software to decode the yield.

DATA ANALYSIS AND RESULTS:

DESCRIPTIVE STATISTICS:

A total of 180 patients have responded to the survey, of which 58.3% were Female and 41.7% were Male. Details regarding Age and Area of Residence are presented in the **Table 1**.

Variables	**Categories**	**N=180**	**Percentage**
AGE	Less than 20	15	8.3%
	20-40	105	58.3%
	40-60	46	25.6%
	Above 60	14	7.8%
GENDER	Male	75	41.7%
	Female	105	58.3%
AREA OF RESIDENCE	Urban	65	36.1%
	Semi – urban	52	28.9%
	Rural	63	35%

Table 1 – Demographic characteristics of the patients

Table 2 represents the variables related to patient's safety in radiology department. After analyzing the data, it can be noticed that majority of the patients were satisfied with the safety measures provided to them in the radiology department. **Chart 1** depicts the overall satisfactory level of patients.

Variables	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
The patient identification is properly cross – cross-checked.	48 (26.7%)	107 (59.4%)	8 (4.4%)	11 (6.1%)	6 (3.3%)
Is the requisition form priorly overviewed.	55 (30.6%)	91 (50.6%)	20 (11.1%)	14 (7.8%)	_
My medical history along with the confirmation of my / her LMP dates of child bearing age were noted	58 (32.2%)	86 (47.8%)	21 (11.7%)	11 (6.1%)	4 (2.2%)

correctly.					
The movement of the patients have been carried out with the use of suitable portables ensuring safety respectively.	61 (33.9%)	91 (50.6%)	18 (10%)	7 (3.9%)	3 (1.7%)
The technician in-charge informed, assisted and prepared me for the assessment duration with prior procedure reveal.	56 (31.1%)	89 (49.4%)	22 (12.2%)	9 (5%)	4 (2.2%)
I had been instructed to strip off my ornaments of any metals before the commencement of actual screening.	68 (37.8%)	87 (48.3%)	16 (8.9%)	7 (3.9%)	2 (1.1%)
I was provided with clean gowns / lead aprons, in the event of radiological subjection.	66 (36.7%)	78 (43.3%)	21 (11.7%)	11 (6.1%)	4 2.2%
The work environment was void of all impurities, with the standard of sanity levelling the required state.	69 (38.3%)	85 (47.2%)	19 (10.6%)	7 (3.9%)	_
The assurance to my rightful privacy wasn't distorted, while my diagnosis was tender with utmost care.	54 (30%)	104 (57.8%)	11 (6.1%)	7 (3.9%)	4 (2.2%)
Radiation cautioning signboards & notice banners were displayed at the appropriate sections.	65 (36.1%)	71 (39.4%)	26 (14.4%)	16 (8.9%)	2 (1.1%)
The diagnosis arena was severed from all amenities guarded to prevent any unauthorized amateur entries.	63 (35%)	82 (45.6%)	20 (11.1%)	10 (5.6%)	5 (2.8%)
The radiation zone is well shielded, with doors securely closed whenever opened.	72 (40%)	76 (42.2%)	19 (10.6%)	8 (4.4%)	5 (2.8%)

Table 2 – Frequency and Percentage of the variables

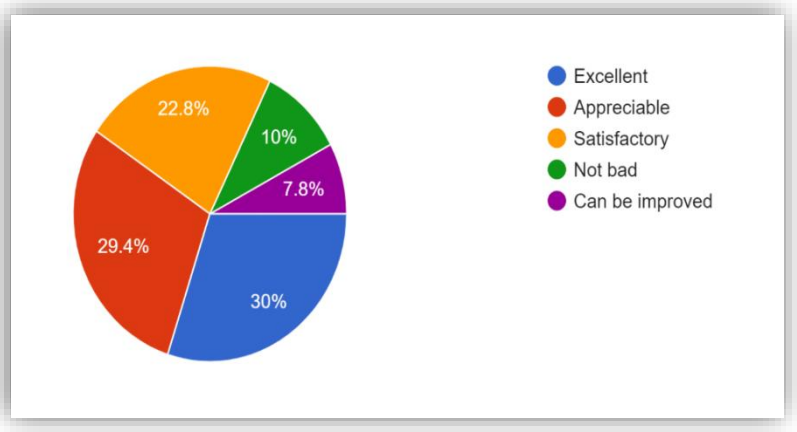

Chart 1 – Overall satisfaction of patients

CHI-SQUARE ANALYSIS:

The chi-square test of independence is a statistical test used to determine if there is a significant association between two categorical variables.

This study tries to test the association between Age and Overall satisfaction of the patients. The hypotheses are as follows: Null Hypothesis **(H_0):** There is no significant association between age and overall satisfaction of patient. Alternate Hypothesis **(H_1):** There is a significant association between age and overall satisfaction of patient.

The following result is obtained:

The significant value is 0.198 which is greater than 0.05(P value >0.05). Hence, we accept the null hypothesis, so there is no significant association between Age and Overall satisfaction of patient.

KARL PEARSON CORRELATION:

Correlation is a statistical measure that indicates how strongly two variables are related to each other. It shows the degree to which changes in one variable are associated with changes in the other variable.

This study tries to test the relationship between appropriate cross-checking of patient's identity and overall satisfaction of patient. The hypotheses are as follows: Null Hypothesis **(H_0):** There is no significant relationship between appropriate cross-checking of patient's identity and overall satisfaction of patient. Alternate Hypothesis **(H_1):** There is a significant relationship between appropriate cross-checking of patient's identity and overall satisfaction of patient.

The following result is obtained:

r value is positive and significant 2-tailed value is less than 0.05, hence we reject the null hypothesis and accept the alternate hypothesis. Since **r = 0.569**, there is a moderate positive correlation between appropriate cross-checking of patient's identity and overall satisfaction of patient.

DISCUSSION:

After keen analysis of the study undertaken, certain postulates are laid before some being appraisals from the former method of act, some demanding a radical change of element to prioritize the ultimate epitome of patient safety. With a well built up questionnaire that collected diverse responses from distinguishable crowd, thereby certain notable spots are in a place of strenuous chastisement, that includes Patient Identity proofreading, gaining the trust and co-operation of patients undergoing the process besides

their kith and kins by installing people-friendly technicians who can elaborate the process to both elites and amateurs, negligence of workers towards ignorant recently married females. Additionally, the system and culture of radiologists precisely their work ethics must always be at check, while ceaseless or periodic routine of new found training methodologies be taught by an expertise on campus or off campus for upliftment of service rendered towards the diverse range of civilians.

CONCLUSION:

Patient safety grabs the sole focus in the profession of all needed dignified health care. It's motto is to deter and mitigate perils, mistakes and vileness that might occur to the patients, while the designated healthcare is issued. The findings strongly portray efficient appraisal of Patient safety with decent satisfactory level of the patients. However, this doesn't make the field a grain of mustard seed with no flaws. In fact, everything has got its drawbacks with each of them either blooming to higher standard or succumbing to doom. Based on this, the field is still open to many progressive changes that may highlight the safety of its patients in a more effective manner by boosting the already existing protocols. Hereby, we conclude that Patient safety in radiology is a dynamite issue that encapsulates Progressive research, Inter-dependence, and ceaseless up gradation.

REFERENCES:

1. Agrawal, A. (2014). *Patient Safety*. Springer.
2. Broder, J. C., Cameron, S. F., Korn, W. T., & Baccei, S. J. (2018). Creating a radiology quality and safety program: Principles and pitfalls. *Radiographics*, *38*(6), 1786–1798.
3. Bruno, M. A., & Nagy, P. (2014). Fundamentals of quality and safety in diagnostic radiology. *Journal of the American College of Radiology*, *11*(12), 1115–1120.
4. Dickerson, J. M., Koch, B. L., Adams, J. M., Goodfriend, M. A., & Donnelly, L. F. (2010). Safety coaches in radiology: Decreasing human error and minimizing patient harm. *Pediatric Radiology*, *40*, 1545–1551.
5. Donnelly, L. F., Dickerson, J. M., Goodfriend, M. A., & Muething, S. E. (2010). Improving patient safety in radiology. *American Journal of Roentgenology*, *194*(5), 1183–1187.
6. European Society of Radiology (ESR. (2019). Patient safety in medical imaging: A joint paper of the European Society of Radiology (ESR) and the European Federation of Radiographer Societies (EFRS). *Radiography*, *25*(2), e26–e38.
7. Frush, K. S., Alton, M., & Frush, D. P. (2006). Development and implementation of a hospital-based patient safety program. *Pediatric Radiology*, *36*, 291–298.
8. Johnson, C. D., Krecke, K. N., Miranda, R., Roberts, C. C., & Denham, C. (2009). Developing a radiology quality and safety program: A primer. *Radiographics*, *29*(4), 951–959.
9. Larson, D. B., Kruskal, J. B., Krecke, K. N., & Donnelly, L. F. (2015). Key concepts of patient safety in radiology. *Radiographics*, *35*(6), 1677–1693.
10. Lee, Y.-H., Chen, C. C.-C., Lee, S.-K., Chen, C.-Y., Wan, Y.-L., Guo, W.-Y., Cheng, A., & Chan, W. P. (2016). Patient safety during radiological examinations: A nationwide survey of residency training hospitals in Taiwan. *BMJ Open*, *6*(9), e010756.
11. Parkes, M., Green, S., Stevens, A., & Clutton-Brock, T. (2014).

Assessing and ensuring patient safety during breath-holding for radiotherapy. *The British Journal of Radiology*, *87*(1043), 20140454.

12. Reagan, J. T., & Slechta, A. M. (2010). Factors related to radiation safety practices in California. *Radiologic Technology*, *81*(6), 538–547.

13. Swensen, S. J., & Johnson, C. D. (2005). Radiologic quality and safety: Mapping value into radiology. *Journal of the American College of Radiology*, *2*(12), 992–1000.

14. Tourgeman-Bashkin, O., Shinar, D., Donchin, Y., Zmora, E., Velleman, N., & Libson, E. (2013). Radiology department, human factors and organizational perspectives: Using action research to improve patient safety. *Israel Journal of Health Policy Research*, *2*(1), 1–9.

15. Wallin, A., Gustafsson, M., Anderzen Carlsson, A., & Lundén, M. (2019). Radiographers' experience of risks for patient safety incidents in the radiology department. *Journal of Clinical Nursing*, *28*(7–8), 1125–1134.

16. Williams, M. (2007). Improving patient safety in radiotherapy by learning from near misses, incidents and errors. *The British Journal of Radiology*, *80*(953), 297–301.

17. Zygmont, M. E., Itri, J. N., Rosenkrantz, A. B., Duong, P.-A. T., Gettle, L. M., Mendiratta-Lala, M., Scali, E. P., Winokur, R. S., Probyn, L., & Kung, J. W. (2017). Radiology research in quality and safety: Current trends and future needs. *Academic Radiology*, *24*(3), 263–272.