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Identify the diversity of diagnostic equipment, case variations, and number of human resources in the radiology polyclinic at Ibnu Sina teaching hospital Makassar in the January-December 2022 period

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ABSTRACT
The study was conducted at Ibnu Sina Teaching Hospital Makassar to investigate the diversity of diagnostic equipment, case variations, and human resources in radiology polyclinics in the period January-December 2022. This study used a descriptive cross-sectional design with a sample of patients who had undergone radiology examinations at the polyclinic radiology and recorded in the medical records of Ibnu Sina Teaching Hospital during that period. The research results showed that the diagnostic equipment at RSP Ibnu Sina Makassar for the period January - December 2022 was 1 unit of conventional radiology, 1 unit of ultrasonography (USG), and 1 unit of computed tomography (CT-Scan). Meanwhile, human resources were recorded at 15 people, with 7 radiographers, 1 administrative person, 1 radiation protection officer, and 6 radiology specialist doctors. The most cases were bronchitis 595 (20.93%) and hypertension heart disease 667 (23.46%) in the chest x-ray examination type, cholelithiasis 119 (13.84%) and fatty liver 116 (13.49%) in the ultrasound examination type. abdomen, and adnexal tumors or ovarian tumors 274 (42.35%) in the CT-Scan examination type.

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INTRODUCTION

Educational facilities are health service facilities other than teaching hospitals that are used as a place to provide medical education. Medical professional education (MPPD) students are expected to be able to meet the Medical Professional Education Standards which are the reference in administering medical education programs by the Faculty of Medicine. One of them is the Indonesian Muslim University which has a Faculty of Medicine which is a vehicle for education in the health sector. Which continues in the second stage after the undergraduate medical study program. In fulfilling medical professional education

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standards, MPPD continues the learning process in hospitals. These include diagnostic radiology health services (Andrasukma, 2020) .

The learning process at the hospital can make MPPD reach the Indonesian Doctor Competency Standards (SKDI). In this case, the faculty provides a workplace as a vehicle for clinical education. The clinical education vehicle in question is a teaching hospital (Rahayu, 2020). Teaching hospitals function as places for education, research and health services. In carrying out their duties during the professional education period, MPPD is given the opportunity to be involved in health services with the guidance and supervision of clinical teaching doctors (DPK). Apart from providing guidance, DPK also provides clinical services in accordance with statutory provisions, providing patients with a variety of cases and numbers in accordance with educational needs (Indonesia, 2019).

Most of the cases in teaching hospitals are referral cases so they are more suitable as a place for professional specialist - subspecialist education. Which diagnoses cases using radiology tools. Radiological imaging has benefits for patient follow-up as well as diagnostic significance (Nugraha, 2019).

Chest x-ray radiology imaging is one of the most frequently performed examinations. According to the Ministry of Health of the Republic of Indonesia in 2020, tuberculosis is ranked 2nd in the world with Indonesians being the highest number of tuberculosis sufferers in the world, so it is certain that there will be many requests for radiological lung imaging (Kemenkes, 2020).

This large number of requests creates a need for increased human resources in hospitals. With increased human resource skills such as radiology specialists, radiographers and radiology administrative staff, it is hoped that the diagnostic process will become faster and more precise (Fatimah, 2019).

Therefore, as a researcher, I am interested in conducting research to see the completeness of diagnostic equipment, case variations and human resources at the Ibnu Sina Hospital in Makassar according to hospital and teaching hospital standards in the field of radiology.

METHOD

This research is a descriptive study looking at the prevalence of diversity of diagnostic equipment, case variations and human resources in the radiology clinic at Ibnu Sina Teaching Hospital for the period January-December 2022. The research design used was cross-sectional. The samples for this study were patients who had completed a radiological examination and were recorded in the patient's medical record using purposive sampling, then the data were analyzed descriptively using a calculator in tabular form.

RESULTS AND DISCUSSION

This research was carried out at the Ibnu Sina Teaching Hospital in September 2023. The data obtained was in the form of medical record data from patients who had undergone radiological examinations at the radiology polyclinic in the period January-December 2022. The data taken in this study was filtered based on inclusion and exclusion criteria to see

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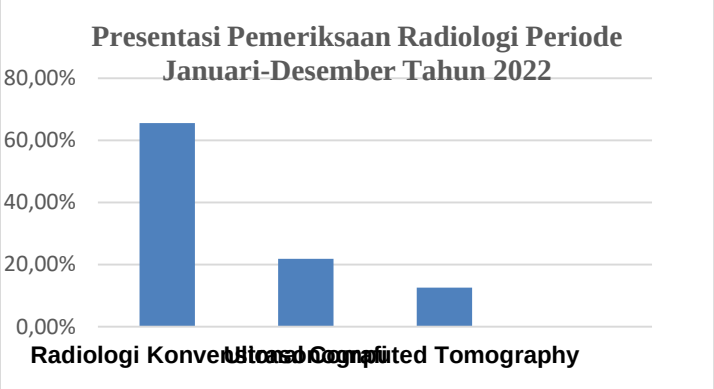
variations in diagnostic equipment, case variations, and human resources. From research in the form of administrative data for diagnostic equipment, data was obtained on 3 radiology tools and there were 15 medical personnel in the human resources category, while from patient medical record data it was found that the total number of radiological examination cases was 13,704 and the total variation of cases was 4,350 cases.

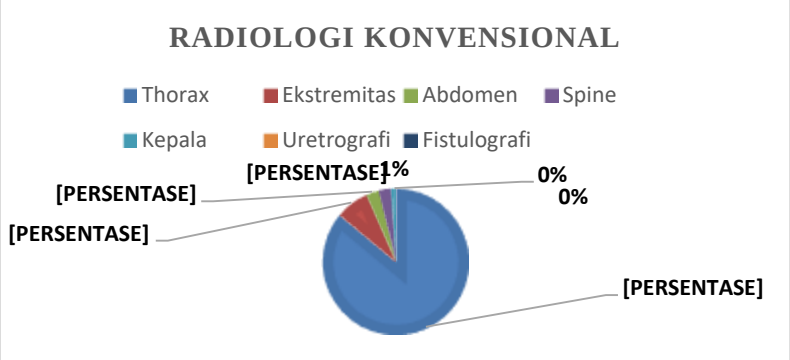
The following are the results of the research description which are presented in the form of a chart as follows:

Table 1. Presentation of Radiological Examinations for the Period January-December 2022



From table 1, conventional radiology examinations were most frequently performed with a total sample of 8,976 (65.50%), followed by Ultrasonography examinations 2,998 (21.88%), and finally CT-Scans 1,730 (12.62%).

Table 2. Percentage of Conventional Radiology Examinations for the Period January-December 2022



In table 2 of conventional radiology examinations or conventional X-Rays, the most examinations from January to December 2022 were Thorax examinations 7,721 (86.02%), Extremity examinations 667 (7.43%), Abdomen examinations 261 (2.91%), Spine examination was 237 (2.64%), head examination was 77 (0.86%), X-Ray examination with contrast was Urethrography 7 (0.08%) and Fistulography 6 (0.06%).

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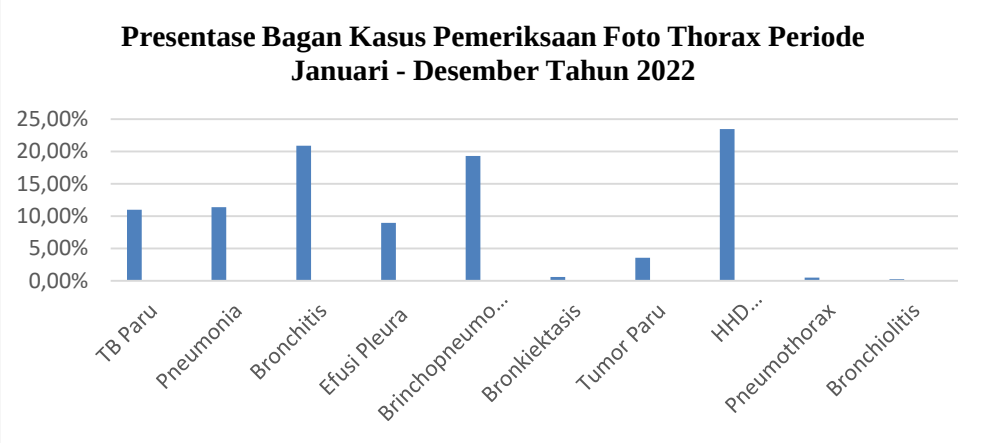
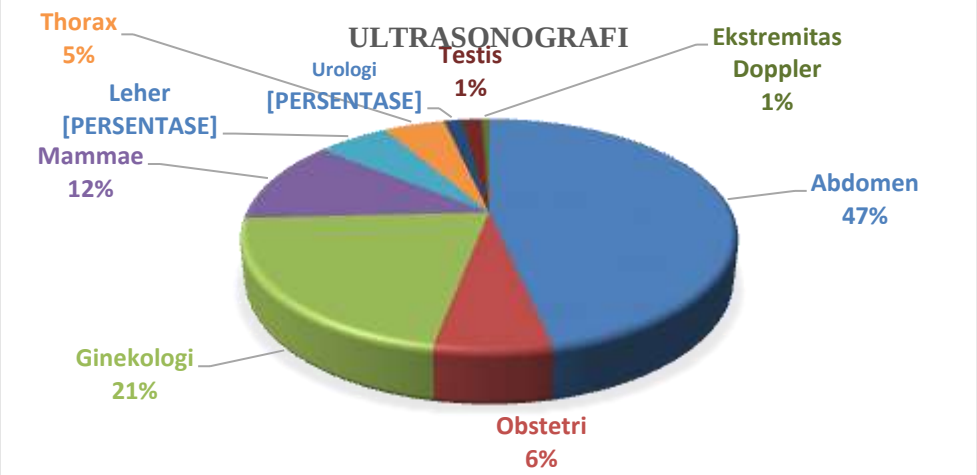
Table 3. Percentage of Thorax Photo Examination Cases for the Period January-December 2022



In table 3, the most cases of chest x-ray examination with the impression of reading results were cardiomegaly (Hypertension Heart Disease) with 667 (23.46%) cases, bronchitis 595 (20.93%), bronchopneumonia 550 (19.34%), pneumonia 324 (11.40%), pulmonary tuberculosis 313 (11.01%), pleural effusion 255 (8.97%), lung tumor or nodule 101 (3.55%), bronchiectasis 17 (0.60%), pneumothorax 14 (0.49%), and finally bronchiolitis in 7 (0.25%) cases.

Table 4. Percentage of Ultrasonography Examinations for the Period January-December 2022



In table 4 of Ultrasonography examinations, the most frequent examinations from January to December 2022 were Abdomen examinations 1,396 (46.56%), Obstetrics-Gynecology examinations 194 (6.47%) and 632 (21.18%), mammary examinations 350 (11.67%), neck examination 171 (5.70%), thorax examination 145 (4.84%), urological examination 45 (1.50%), testicular examination 44 (1.48%), and finally extremity examination Doppler 21 (0.60%).

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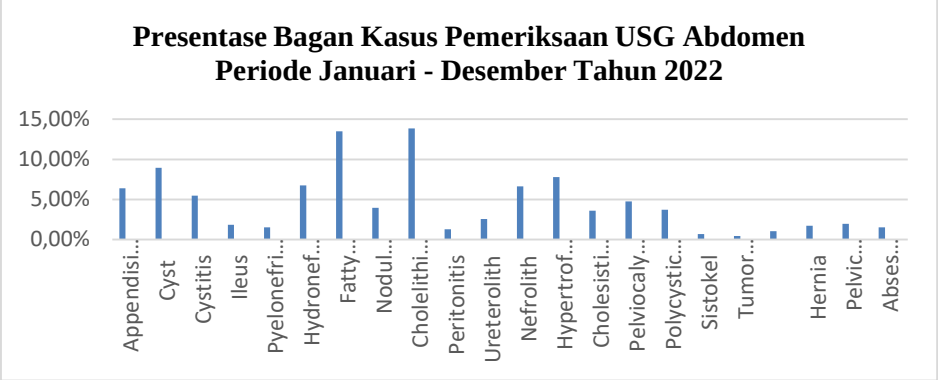
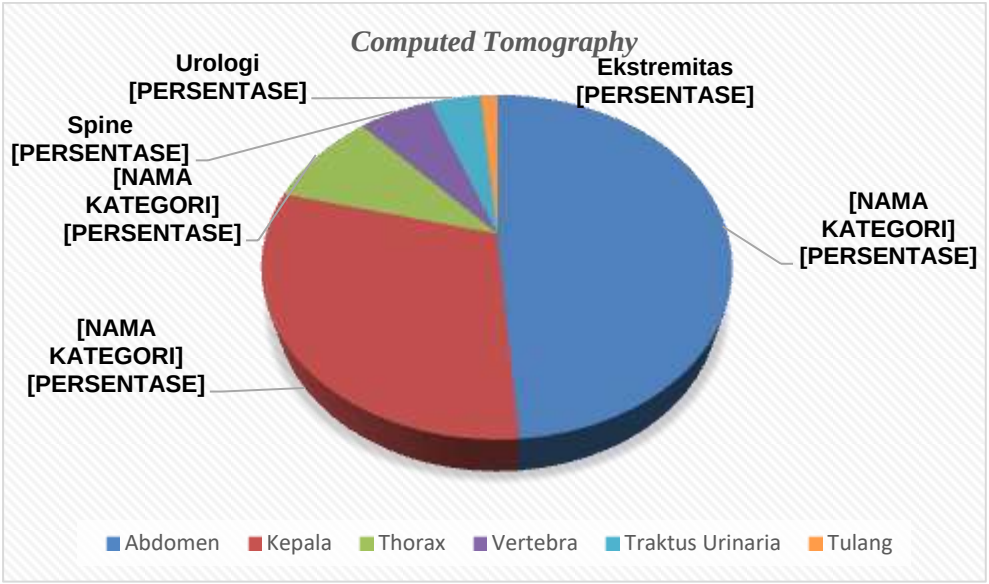
Table 5. Percentage of Abdominal Ultrasonography Examination Cases for the Period January- December 2022



In table 5 of abdominal ultrasound examination, the most cases were cholelithiasis 119 (13.84%), hepatomegaly and fatty liver 116 (13.49%), tumor or cyst 77 (8.95%), prostate hypertrophy 67 (7.79%), hydronephrosis 58 (6.74%), nephrolith 57 (6.63%), appendicitis 55 (6.39%), cystitis 47 (5.46%), pelviocaliectasis 41 (4.77%), liver nodule 34 (3.95%), polycystic kidney 32 (3.72%), cholecystitis 31 (3.60%), pelvic inflammatory disease 17 (1.98%), ileus 16 (1.86%), hernia 15 (1 .74%), liver abscess 13 (1.53%), pyelonephritis 13 (1.53%), peritonitis 11 (1.28%), ectopic pregnancy 9 (1.05%), cystocele 6 (0.70%) and finally colon tumors in 4 (0.46%) cases.

Table 6. Percentage of Computed Tomography Examinations for the Period January-December 2022



In table 6 CT-Scan examinations, the most frequent examinations from January to December 2022 were Abdomen examinations 844 (48.79%), Head examinations 523

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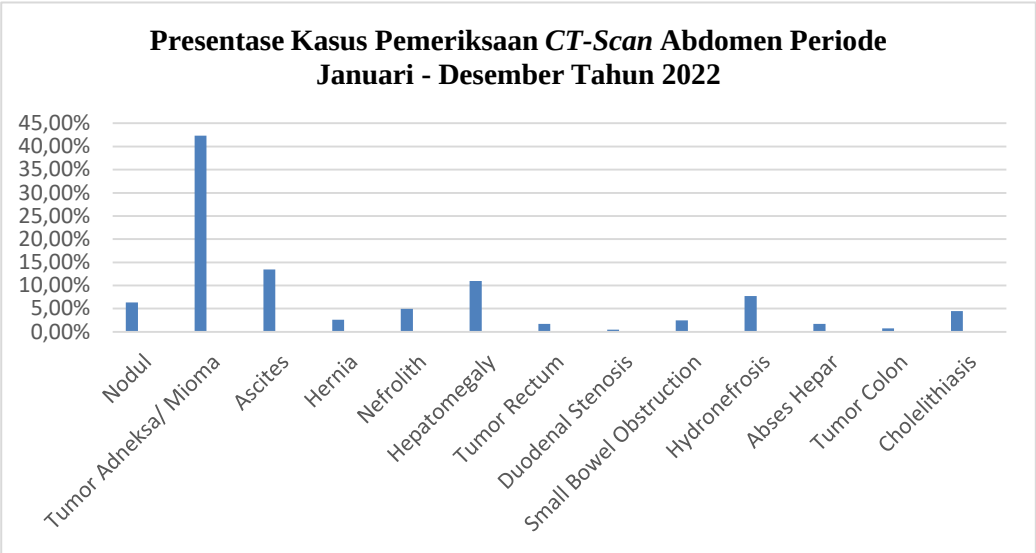
(30.23%), Thorax examinations 159 (9.29%), Spine examinations 105 (6.07%), Urological examination 73 (4.22%), and finally Extremity examination 26 (1.40%).

Table 7. Percentage of Abdominal Computed Tomography Examination Cases for the Period January-December 2022



In table 7 of the abdominal CT-Scan examination, the most cases were adnexal tumors or uterine myoma 274 (42.35%), ascites 87 (13.45%), hepatomegaly 71 (10.97%), hydronephrosis 50 (7.73 %), nodules or tumors 41 (6.34%), nephroliths 32 (4.94%), cholelithiasis 29 (4.49%), hernia 17 (2.63%), small bowel obstruction 16 (2.47%), liver abscess 11 (1.70%), rectum tumor 11 (1.70%), colon tumor 5 (0.77%), and finally duodenal stenosis 3 (0.46%) cases.

Discussion

The data that has been obtained shows that the human resources and radiological diagnostic equipment available in the radiology installation are in accordance with the requirements for a Type B Hospital, which is equivalent to the number of specialist doctors, 7 radiographers, 1 PPR person, and 1 administrative person. With 1 unit of Conventional Radiology diagnostic equipment, 1 unit of Ultrasonography, and 1 unit of CT-Scan. Based on the regulations of the Indonesian Ministry of Health, each radiology examination unit must have 2 workers so that with a total of 3 units of diagnostic equipment owned, the number of radiographers is more than enough, 7 people are more than enough and specialist doctors with a regulation of 25 patients per day, 6 specialist doctors have met the requirements. (Herring, 2012).

The results of the number of types of radiological examinations show that conventional radiological examinations are the most frequently performed examinations, conventional radiology is the imaging tool most commonly obtained. Common uses of conventional radiology include chest x-rays, plain abdominal radiographs, and are always used as an initial examination of cases to rule out fractures or arthritis. From the results

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above, it was found that there were more radiological examinations of the lungs than other body examinations. Lung examination without x-ray examination is currently considered incomplete. A lung disease cannot be excluded with certainty before a radiological examination is carried out (Efendi, 2020).

Basic Health Research (Riskesdas) conducted by the Ministry of Health in 2018 increased the incidence of hypertension compared to the results in 2013. The prevalence of hypertension based on the 2018 Riskesdas results was 34.1%. Hypertension is one of the main risk factors for cardiovascular disease, cardiomegaly. According to the profile of the South Sulawesi Health Service in 2021, non-communicable diseases are the cause of 60% of deaths, one of which is COPD. COPD is a group of progressive lung diseases, the most common of which are emphysema and chronic bronchitis. According to the World Health Organization (WHO), around 64 million people suffer from bronchitis in the world. The main risk factors are smoking, air pollution, dust and chemicals (Hakim, 2017).

According to the Health Service profile, the number of pneumonia cases in 2020 was around 33,345 cases. The incidence of pneumonia is more common in developing countries. Pneumonia attacks around 450 million people every year. Based on 2018 RISKESDAS data, the prevalence of pneumonia based on health worker diagnosis is around 2%, whereas in 2013 it was 1.8%. In 2010 in Indonesia, pneumonia was included in the top 10 inpatient diseases in hospitals with a crude fatality rate (CFR) or the death rate for a particular disease in a certain time period divided by the number of cases, which was 7.6%. In 2020 the number of pulmonary TB sufferers in districts/cities was 18,863 cases, Makassar city has the most pulmonary TB sufferers (Imanuel, 2021).

Ultrasonography imaging is relatively cheap compared to CT-Scan and MRI imaging. It is proven in the results above that the second most common radiological examination is Ultrasonography followed by CT-Scan examination. Ultrasound is very useful in evaluating the upper abdomen, female pelvic organs, and superficial structures such as the thyroid, breasts, scrotum, pregnant women, and children where the above results obstetric-gynecological examinations are often carried out accompanied by a thorough abdominal examination. Ultrasonography is very useful in imaging soft tissue and for differentiating solid and cystic structures so that ultrasound examinations are often performed for mammary and gynecological examinations (Zamri).

The incidence of cholelithiasis in Indonesia is thought to not be much different from the figures in other countries in Southeast Asia. Meanwhile, fatty liver is a fatty liver disease with a prevalence of 10-50% in the world. Based on data from the Center for Anatomical Pathology in Indonesia, malignant ovarian tumors are the third most common malignant tumor among malignant tumors in the female genital tract. Apart from that, malignant ovarian tumors are the third largest cause of death after malignant breast tumors and malignant cervical tumors. Ovarian tumors are one of the diseases that are often found on abdominal ultrasound examinations, apart from that, the majority of cysts in the liver are also often found on ultrasound examinations. And this data is in line with abdominal CT-Scans that the most cases found are ovarian tumors or uterine myomas (Tsuruya, 2021)

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CT scan imaging is more expensive to obtain and operate than other radiological examinations. CT-Scan is a useful screening tool to detect possible tumors or lesions in the stomach. It can be used to take pictures of the head to find the location of injuries, tumors, blood clots that cause strokes, bleeding, and other conditions. Lung examination to reveal the presence of tumors, pulmonary embolism (blood clots), excess fluid, and other conditions such as emphysema or pneumonia. In fractures of bones, joints, cartilage, or tendons because it usually produces more detail than conventional radiology (Rahayu, 2020).

CONCLUSIONS

The complete set of diagnostic equipment available at the Ibnu Sina Makassar Teaching Hospital meets the criteria for an educational hospital with a total of 3 units of radiology equipment including conventional radiology, ultrasonography and Computed Tomography. The number of human resources in the radiology polyclinic at Ibnu Sina Hospital Makassar has met the requirements for a teaching hospital or type B hospital with a total of 15 people divided into 7 radiographers, 1 administrative person, 1 radiation protection officer, and 6 doctors. radiology specialist. Meanwhile, the number of types of radiological examinations at the radiology polyclinic at Ibnu Sina Hospital in Makassar from January to December 2022 reached 13,704 radiological examinations. Of the total, conventional radiology examinations are the most frequently performed examinations, followed by ultrasonography and CT scans. The most cases in conventional radiology examinations are thorax examinations with images of cardiomegaly (HHD) and bronchitis, from ultrasonography examinations, abdominal examinations are the most common type of examination followed by the most cases being cholelithiasis and fatty liver. Meanwhile, the most common type of CT-Scan examination is on the abdomen in cases of ovarian tumors. In conventional radiological examinations, chest x-ray examinations are the most common type of radiological examination, while in abdominal examinations, ultrasonography and CT-scan imaging are the most common. It is recommended for future researchers to examine the level of patient satisfaction when carrying out examinations in the Radiology Installation as a reference for evaluating hospitals in developing diagnostic equipment and human resources.

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