

ASSESSMENT OF RADIOLOGIC FACILITIES IN SELECTED RURAL HEALTH UNIT IN MAGUINDANAO DEL NORTE

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Abstract

This study assessed the status of radiologic facilities and services in selected Rural Health Units (RHUs) in Maguindanao del Norte. It aimed to determine the demographic profile of respondents, evaluate the availability and condition of radiologic facilities and services, identify problems encountered by RHUs, and gather recommendations for improvement. The study used a Convergent Parallel Mixed Methods Research Design, combining descriptive-correlational and thematic analysis approaches. Data were gathered through a researcher-made questionnaire from healthcare personnel selected through availability sampling. Statistical tools such as frequency count, percentage, weighted mean, standard deviation, and Pearson-r correlation were used in analyzing quantitative data, while thematic analysis was applied to qualitative responses.

Findings revealed that most RHUs lack adequate radiologic equipment, services, trained personnel, and compliance with Department of Health (DOH) standards. Maintenance practices and safety measures were also found to be insufficient, resulting in frequent patient referrals to other healthcare facilities. Some demographic variables showed significant relationships with certain aspects of radiologic facility assessment, leading to the partial acceptance and rejection of the null hypothesis. Respondents recommended acquiring radiologic equipment, increasing government support, hiring and training qualified personnel, improving referral systems, and strengthening community awareness. The study concluded that selected RHUs in Maguindanao del Norte face major challenges in providing effective radiologic services due to limited resources and inadequate infrastructure. Comprehensive interventions and stronger collaboration among healthcare institutions and government agencies are recommended to improve healthcare delivery in rural communities.

Keywords: Radiologic Facilities, Rural Health Unit, Maguindanao del Norte

INTRODUCTION

Access to quality healthcare services is essential in promoting positive health outcomes for all members of the community particularly those living in rural and geographically isolated areas. Among the fundamental services in primary healthcare is diagnostic imaging which plays a critical role in detecting diseases early, guiding treatment decisions and monitoring patient progress. Basic imaging modalities such as X-ray and ultrasound are considered essential components of primary care because they help healthcare providers identify injuries, infections and internal conditions that are not easily detected through clinical examinations alone (World Health Organization (WHO), 2021). Diagnostic imaging is particularly important in the management of both communicable and non-communicable disease which remain significant causes of morbidity and mortality in developing countries (The Lancet Commission on Diagnostics, 2021).

Despite its central role in healthcare delivery, access to diagnostic imaging remains uneven especially in rural areas. Studies conducted in the Philippines have shown that diagnostic imaging services are concentrated in urban centers leaving rural health units under-equipped and underserved (Department of Health, (DOH) 2019). These disparities are partly due to logistical, financial and infrastructural barriers that limit the availability and accessibility of basic diagnostic facilities in rural settings (WHO, 2021). As a result, patients in rural areas often face challenges in obtaining timely imaging services which may lead to delayed diagnosis, increased referrals to higher level hospitals and higher out of pocket expenditures (Wilson et al., 2019).

In the Philippine setting, government policies have recognized the importance of strengthening primary healthcare including ensuring the availability of essential medical equipment and services in rural health facilities (DOH, 2019). Programs such as the Philippine Essential Medical Device List aim to standardize priority health technologies including diagnostic imaging tools across public health settings (DOH, 2020). However, challenges remain in ensuring equitable distribution and proper maintenance of these resources in rural areas (WHO, 2021). Given the critical role of radiologic imaging in early detection, diagnosis and effective treatment, and the persistent disparities in imaging access between rural and urban communities (LCD, 2021), it is important to systematically assess the status of radiologic facilities at the primary healthcare level.

A focused assessment can provide baseline data on the availability and functional status of equipment, maintenance of the equipment, availability of human resource and the compliance with Department of Health Accreditation. Such data are essential for guiding policy decisions and strengthening rural health systems. By identifying these existing gaps in these aspects, the study aims to generate baseline data that can serve as a foundation for evidence-based planning and decision-making at the municipal and provincial levels. Ultimately, assessing the readiness and adequacy of radiologic facilities is essential in promoting timely diagnosis and supports in improving health outcomes among the population served by these Rural Health Units in Maguindanao del Norte.

Statement of the Problem

This study aims to assess the radiologic facilities in selected RHUs in Maguindanao del Norte. Specifically, it seeks to answer the following questions:

1. What is the demographic profile of the respondents in terms of:
 - 1.1 Age;
 - 1.2 Sex;
 - 1.3 Civil Status
 - 1.4 Position; and
 - 1.5 Employment Status
2. What is the status of selected Rural Health Units in Maguindanao del Norte in terms of:
 - 2.1 Presence of Radiologic Facilities;
 - 2.2 Availability of Radiologic Services;
 - 2.3 Maintenance of Radiologic Equipment;
 - 2.4 Availability of Human Resources; and
 - 2.5 Compliance with Department of Health Standards and Accreditation?
3. What problems are encountered by the selected Rural Health Units in Maguindanao del Norte in relation to radiologic facilities and services?
4. What suggestions can be proposed by the respondents to improve the presence and availability of radiologic facilities in the selected Rural Health Units?
5. Is there a significance relationship between the demographic profile and the assessment of radiologic facilities in selected Rural Health Units in Maguindanao del Norte.

Hypothesis

Ho: There is no significant relationship between the demographic profile of the respondents and their assessment of radiologic facilities in selected Rural Health Units in Maguindanao del Norte.

Ha: There is significant relationship between the demographic profile of the respondents and their assessment of radiologic facilities in selected Rural Health Units in Maguindanao del Norte.

METHODS

This study employed a Convergent Parallel Mixed Method Research Design to comprehensively assess the status of radiologic facilities and services in selected Rural Health Units in Maguindanao del Norte. This research design involves the simultaneous collection of both quantitative and qualitative data, separate analysis of two data sets and integration of the findings during interpretation and discussion. The quantitative component of the study employed a descriptive correlational approach to determine the demographic profile of the respondents and assess the status of radiologic facilities and services in terms of presence of radiologic equipment, availability of radiologic services, maintenance of radiologic equipment, availability of human resources and compliance with DOH

Standards and Accreditation. It also determined the significant relationship between the demographic profile of respondents and their assessment of radiologic facilities through the use of statistical tools.

On the other hand, the qualitative component focused on identifying the problems encountered by Rural Health Units and the suggestions proposed by respondents to improve the presence and availability of radiologic facilities and services. The qualitative data gathered from open-ended responses were analyzed using thematic analysis to identify common themes, patterns and recommendations from respondents. The use of Convergent Parallel Mixed Methods enabled the researchers to gather comprehensive and in-depth information by combining numerical data and respondents' personal insights and experiences. The integration of quantitative and qualitative findings provided a clearer understanding of the existing condition of radiologic facilities and services in Rural Health Units and the possible interventions needed to improve healthcare delivery in rural communities.

The study was conducted in selected Rural Health Units located in the province of Maguindanao del Norte specifically municipalities of Datu Blah Sinsuat, Upi, and Datu Odin Sinsuat. These municipalities were chosen because they are government operated primary healthcare facilities that provide basic health services including limited diagnostic and radiologic services to their respective communities. The selected RHUs serves predominantly rural populations and play a vital role in the delivery of primary healthcare services particularly in areas where access to secondary and tertiary hospitals is limited. Assessing the radiologic facilities in these RHUs is essential to understand its capacity to support diagnostic imaging needs at the community level. These municipalities represent a range of geographic and demographic characteristics within Maguindanao del Norte making them suitable sites for evaluating the current status of radiologic facilities in rural healthcare settings. The findings of the study are expected to provide relevant information that may contribute to the improvement of radiologic services and healthcare delivery in similar rural communities.

The respondents of the study consisted of healthcare personnel currently employed in the selected Rural Health Units in Maguindanao del Norte. This includes nurses, midwives, public health nurse and municipal health officers working within the Rural Health Unit. The inclusion of all RHU healthcare personnel allows the researchers to gather a broader perspective regarding the presence, availability and functionality of radiologic facilities. Participation in the study will be voluntary and only those who consented will be included as respondents.

RESULTS

Table 1
Demographic Profile of the Respondents

Demographic Profile	f	%
<i>Name of Rural Health Unit</i>		

	DBS	23	29.5
	DOS	20	25.6
	UPI	35	44.9
<i>Age</i>			
	20 – 29 years old	18	23.1
	30 – 39 years old	20	25.6
	40 – 49 years old	24	30.8
	50 years old and above	16	20.5
<i>Sex</i>			
	Male	3	3.8
	Female	75	96.2
<i>Civil Status</i>			
	Single	24	30.8
	Married	51	65.4
	Widowed	2	2.6
	Separated	1	1.3
<i>Employment Status</i>			
	Permanent	31	39.7
	Contractual	40	51.3
	Job Order	3	3.8
	Others	4	5.1
<i>Position</i>			
	Municipal Health Officer	3	3.8
	Public Health Nurse	1	1.3
	Nurse	21	26.9
	Midwife	53	67.9
	Total	78	100.0

Table 1 presents the demographic profile of the respondents. This further reveal that in terms of the Name of Rural Health Unit, UPI has the highest with 35 or 44.9%, followed by DBS with 23 or 29.5%, and DOS with 20 or 25.6%, indicating that the majority of respondents came from UPI. In terms of age, 40 – 49 years old has the highest with 24 or 30.8%, followed by 30 – 39 years old with 20 or 25.6%, 20 – 29 years old with 18 or 23.1%, and 50 years old and above with 16 or 20.5%, indicating that most respondents belong to the middle-age adult group.

Moreover, in terms of sex, female respondents dominate with 75 or 96.2%, while male respondents are only 3 or 3.8%, showing that the respondents are predominantly female. In terms of civil status, married respondents have the highest with 51 or 65.4%, followed by single with 24 or 30.8%, widowed with 2 or 2.6%, and separated with 1 or 1.3%, indicating that the majority are married. In terms of employment status, contractual employees dominate with 40 or 51.3%, followed by permanent with 31 or 39.7%, others with 4 or 5.1%, and job order with 3 or 3.8%, suggesting that most respondents are employed under contractual status.

On the other hand, in terms of position, midwife has the highest with 53 or 67.9%, followed by nurse with 21 or 26.9%, Municipal Health Officer with 3 or

3.8%, and Public Health Nurse with 1 or 1.3%, indicating that the majority of respondents are midwives. Overall, the demographic profile reveals that the respondents are predominantly female, married, contractual employees, and midwives coming mostly from UPI Rural Health Unit.

Table 2.a

Status of Radiologic Equipment in terms of Presence of Radiologic Equipment

Statement	Mean	SD	Interpretation
1. The RHU has existing radiologic equipment (e.g., Xray, Ultrasound)	1.06	.295	Strongly Disagree
2. The RHU has adequate space for radiologic services.	1.23	.579	Strongly Disagree
3. The availability equipment meets basic diagnostic needs.	1.31	.811	Strongly Disagree
4. The RHU has complete basic radiologic facilities.	1.06	.247	Strongly Disagree
5. The absence of radiologic equipment is evident in RHU	2.85	1.387	Agree
Overall	1.50	.664	Disagree
3.50 – 4.00	Strongly Agree		
2.50 – 3.49	Agree		
1.50 – 2.49	Disagree		
1.00 – 1.49	Strongly Disagree		

Table 2.a presents the status of radiologic equipment in terms of presence of radiologic equipment. This further reveal that the respondents disagree, with an overall mean of 1.50 and a standard deviation of .664, interpreted as “Disagree.” This indicates that the respondents generally perceive that radiologic equipment and facilities are lacking in the selected Rural Health Units.

Moreover, statement 5 “The absence of radiologic equipment is evident in RHU” got the highest mean with a mean of 2.85 and a standard deviation of 1.387, interpreted as “Agree.” This was followed by statement 3 “The availability equipment meets basic diagnostic needs.” with a mean of 1.31 and a standard deviation of .811, interpreted as “Strongly Disagree.” These findings suggest that respondents strongly acknowledge the absence of radiologic equipment and the inability of RHUs to meet diagnostic needs.

On the other hand, statement 1 “The RHU has existing radiologic equipment (e.g., Xray, Ultrasound)” and statement 4 “The RHU has complete basic radiologic facilities.” got the lowest means with a mean of 1.06 and standard deviations of .295 and .247, respectively, both interpreted as “Strongly Disagree.” These results indicate that the RHUs lack existing radiologic equipment and complete radiologic facilities.

Table 2.b

Status of Radiologic Equipment in terms of Availability of Radiologic Services

Statement	Mean	SD	Interpretation
1. Radiologic services are available in the RHU when needed.	1.06	.295	Strongly Disagree
2. Radiologic services are accessible to patients.	1.12	.360	Strongly Disagree
3. Services are provided regularly without interruption.	1.21	.519	Strongly Disagree
4. Patients can easily avail radiologic services.	1.14	.476	Strongly Disagree
5. Patients are referred to other facilities due to lack of services.	2.97	1.367	Agree
Overall	1.50	.603	Disagree
3.50 – 4.00	Strongly Agree		
2.50 – 3.49	Agree		
1.50 – 2.49	Disagree		
1.00 – 1.49	Strongly Disagree		

Table 2.b presents the status of radiologic equipment in terms of availability of radiologic services. This further reveal that the respondents disagree, with an overall mean of 1.50 and a standard deviation of .603, interpreted as “Disagree.” This indicates that radiologic services are generally not available in the selected Rural Health Units.

Moreover, statement 5 “Patients are referred to other facilities due to lack of services.” got the highest mean with a mean of 2.97 and a standard deviation of 1.367, interpreted as “Agree.” This was followed by statement 3 “Services are provided regularly without interruption.” with a mean of 1.21 and a standard deviation of .519, interpreted as “Strongly Disagree.” These findings suggest that patients are frequently referred to other facilities due to unavailability of radiologic services.

On the other hand, statement 1 “Radiologic services are available in the RHU when needed.” got the lowest mean with a mean of 1.06 and a standard deviation of .295, interpreted as “Strongly Disagree.” This was followed by statement 2 “Radiologic services are accessible to patients.” with a mean of 1.12 and a standard deviation of .360, interpreted as “Strongly Disagree.” These results indicate that radiologic services are inaccessible and unavailable within the RHUs.

Table 2.c

Status of Radiologic Equipment in terms of Maintenance of Radiologic Equipment

Statement	Mean	SD	Interpretation
1. Radiologic equipment undergoes	1.19	.536	Strongly Disagree

regular maintenance.				
2. Equipment is inspected periodically.	1.19	.560	Strongly Disagree	
3. Repairs are addressed promptly.	1.18	.503	Strongly Disagree	
4. There is a system for maintenance and servicing.	1.19	.536	Strongly Disagree	
5. Some equipment becomes non-functional due to poor maintenance.	1.79	1.199	Disagree	
Overall	1.31	.667	Strongly Disagree	

3.50 – 4.00 Strongly Agree

2.50 – 3.49 Agree

1.50 – 2.49 Disagree

1.00 – 1.49 Strongly Agree

Table 2.c presents the status of radiologic equipment in terms of maintenance of radiologic equipment. This further reveal that the respondents strongly disagree, with an overall mean of 1.31 and a standard deviation of .667, interpreted as “Strongly Disagree.” This indicates that maintenance practices for radiologic equipment are generally absent or inadequate in the selected Rural Health Units.

Moreover, statement 5 “Some equipment becomes non-functional due to poor maintenance.” got the highest mean with a mean of 1.79 and a standard deviation of 1.199, interpreted as “Disagree.” This was followed by statement 1 “Radiologic equipment undergoes regular maintenance.” with a mean of 1.19 and a standard deviation of .536, interpreted as “Strongly Disagree.” These findings suggest that poor maintenance contributes to equipment problems within the RHUs.

On the other hand, statement 3 “Repairs are addressed promptly.” got the lowest mean with a mean of 1.18 and a standard deviation of .503, interpreted as “Strongly Disagree.” This was followed by statement 2 “Equipment is inspected periodically.” with a mean of 1.19 and a standard deviation of .560, interpreted as “Strongly Disagree.” These results indicate that maintenance systems and repair mechanisms are lacking in the RHUs.

Table 2.d

Status of Radiologic Equipment in terms of Availability of Human Resources

Statement	Mean	SD	Interpretation
1. There are qualified personnel to operate radiologic equipment.	1.17	.495	Strongly Disagree
2. The RHU has sufficient staff for radiologic services.	1.15	.363	Strongly Disagree
3. Personnel are trained in handling radiologic equipment.	1.17	.439	Strongly Disagree
4. Staff are knowledgeable about radiologic procedures.	1.21	.519	Strongly Disagree
5. There is a shortage of trained	2.27	1.402	Disagree

personnel in the RHU.		Overall	1.39	.644	Strongly Disagree
3.50 – 4.00	Strongly Agree				
2.50 – 3.49	Agree				
1.50 – 2.49	Disagree				
1.00 – 1.49	Strongly Agree				

Table 2.d presents the status of radiologic equipment in terms of availability of human resources. This further reveal that the respondents strongly disagree, with an overall mean of 1.39 and a standard deviation of .644, interpreted as “Strongly Disagree.” This indicates that the selected Rural Health Units generally lack qualified personnel and human resources for radiologic services.

Moreover, statement 5 “There is a shortage of trained personnel in the RHU.” got the highest mean with a mean of 2.27 and a standard deviation of 1.402, interpreted as “Disagree.” This was followed by statement 4 “Staff are knowledgeable about radiologic procedures.” with a mean of 1.21 and a standard deviation of .519, interpreted as “Strongly Disagree.” These findings suggest that RHUs experience shortage of trained personnel and lack knowledgeable staff for radiologic procedures.

On the other hand, statement 2 “The RHU has sufficient staff for radiologic services.” got the lowest mean with a mean of 1.15 and a standard deviation of .363, interpreted as “Strongly Disagree.” This was followed by statement 1 “There are qualified personnel to operate radiologic equipment.” together with statement 3 “Personnel are trained in handling radiologic equipment.” both with a mean of 1.17, interpreted as “Strongly Disagree.” These results indicate insufficient staffing and lack of trained personnel for radiologic services.

Table 2.e

Status of Radiologic Equipment in terms of Compliance with DOH standards and Accreditation

Statement	Mean	SD	Interpretation
1. The RHU follows DOH Standards for radiologic facilities.	1.38	.725	Strongly Disagree
2. Radiation safety protocols are implemented.	1.26	.612	Strongly Disagree
3. Required licenses and accreditations are complied with.	1.24	.607	Strongly Disagree
4. Safety equipment (e.g., lead aprons, warning signs) are available.	1.22	.573	Strongly Disagree
5. The RHU undergoes inspection for DOH Compliance.	1.53	.936	Disagree
Overall	1.33	.691	Strongly Disagree
3.50 – 4.00	Strongly Agree		
2.50 – 3.49	Agree		

1.50 – 2.49 Disagree
1.00 – 1.49 Strongly Agree

Table 2.e presents the status of radiologic equipment in terms of compliance with DOH standards and accreditation. This further reveal that the respondents strongly disagree, with an overall mean of 1.33 and a standard deviation of .691, interpreted as “Strongly Disagree.” This indicates that the selected Rural Health Units generally do not comply with DOH standards and accreditation requirements related to radiologic facilities and services.

Moreover, statement 5 “The RHU undergoes inspection for DOH Compliance.” got the highest mean with a mean of 1.53 and a standard deviation of .936, interpreted as “Disagree.” This was followed by statement 1 “The RHU follows DOH Standards for radiologic facilities.” with a mean of 1.38 and a standard deviation of .725, interpreted as “Strongly Disagree.” These findings suggest that compliance monitoring and implementation of standards remain inadequate in the RHUs.

On the other hand, statement 4 “Safety equipment (e.g., lead aprons, warning signs) are available.” got the lowest mean with a mean of 1.22 and a standard deviation of .573, interpreted as “Strongly Disagree.” This was followed by statement 3 “Required licenses and accreditations are complied with.” with a mean of 1.24 and a standard deviation of .607, interpreted as “Strongly Disagree.” These results indicate lack of safety equipment and poor compliance with licensing and accreditation requirements within the RHUs.

PROBLEMS ENCOUNTERED BY THE SELECTED RURAL HEALTH UNITS IN MAGUINDANAO DEL NORTE IN RELATION TO RADIOLOGIC FACILITIES AND SERVICES

THEME 1: ABSENCE OF RADIOLOGIC EQUIPMENT AND FACILITIES

The most dominant problem identified by the respondents is the complete absence of radiologic equipment and facilities in the RHUs. Majority of the respondents emphasized that their facilities do not have available X-ray machines, ultrasound, or any form of radiologic equipment. This absence greatly affects the ability of RHUs to provide diagnostic imaging services to patients.

As stated by respondents, “No available radiologic equipment at the RHU as of the moment.” (Respond 1), “No existing facility.” (Respond 3), “No radiologic equipment available.” (Respond 5), “We don’t have radiologic facilities.” (Respond 10), “There is no radiologic facility in the RHU.” (Respond 17), “No radiologic facilities available.” (Respond 25), and “No X Ray” (Respond 28). These responses indicate that many RHUs operate without even the most basic radiologic diagnostic capability, which significantly limits healthcare services in the community.

THEME 2: LACK OF RADIOLOGIC SERVICES

Closely related to the absence of equipment is the lack of radiologic services being offered in the RHUs. Respondents emphasized that since there are

no facilities or equipment, radiologic services are completely unavailable.

This is evident in the responses, “All services mentioned above are not available in our facility.” (Respond 7), “All services mentioned above are not available in our facility.” (Respond 8), “Not Available” (Respond 9), “We don’t have radiologic facilities and services in RHU.” (Respond 31), and “The RHU doesn’t have or offered any radiologic facilities and services” (Respond 33).

These responses reveal that the issue is not only the lack of equipment but also the complete absence of service provision in the RHUs.

THEME 3: LACK OF TRAINED PERSONNEL

Another major issue identified is the shortage or absence of trained personnel capable of handling radiologic services and equipment. Respondents highlighted the lack of radiologic technologists, radiologists, and trained staff.

As stated by respondents, “Lack of trained personnel for radiologic equipment” (Respond 11), “No available equipment and staff.” (Respond 14), “No radiologic facilities / equipment and no available or trained personnel” (Respond 21), “No radiologist and equipment” (Respond 22), and “The RHU or facility are not qualified or no qualities for radiology activities because no trained personnel, no room for the radiology procedure and no equipment either.” (Respond 26).

These responses suggest that human resource limitations remain a significant barrier even if equipment becomes available.

THEME 4: DEPENDENCE ON REFERRAL SYSTEM AND ACCESSIBILITY ISSUES

Respondents also reported dependence on referral systems because patients need to travel to hospitals or other facilities for radiologic services. This creates accessibility challenges, especially in remote areas.

As stated by respondents, “Distance to nearest radiologic center (from GIDA area to DBS Hospital)” (Respond 18), “Patients were referred to other facility or to the hospitals or clinics having Xray Machines for proper diagnosis.” (Respond 27), and “RHU Pura have no radiology facilities that’s why it’s difficult to refer patient to radiology facilities.” (Respond 34).

These responses indicate that reliance on external facilities delays access to diagnostic imaging services.

THEME 5: DELAYS IN DIAGNOSIS AND FINANCIAL BURDEN

Respondents emphasized that the absence of radiologic facilities results in delayed diagnosis and additional financial burden for patients.

One respondent strongly stated, “Whenever a patient needs imaging, we have to refer them out to the nearest hospital, which is not always easy many of

our patients cannot afford the travel and some simply do not follow through with the referral. These cases delays in diagnosis and sometimes we end up managing patients without the imaging we really need to confirm our clinical impression.” (Respond 24). Similarly, respondents shared “Delayed diagnosis, no available equipment, no trained personnel” (Respond 29) and “It is a burden for them to travel since they have a financial constraint.” (Respond 27).

These responses reveal that lack of radiologic services negatively affects patient outcomes and creates economic difficulties.

THEME 6: LACK OF INFRASTRUCTURE AND FACILITY READINESS

Some respondents mentioned that RHUs are not physically prepared to support radiologic services because of lack of rooms and proper infrastructure.

As stated by respondents, “No standard facility for Xray or ultrasound” (Respond 19) and “No room for the radiology procedure” (Respond 26).

These responses indicate that infrastructure limitations also hinder the establishment of radiologic services.

THEME 7: NORMALIZATION OF ABSENCE OF SERVICES

A few respondents expressed that there are “no problems” simply because radiologic services do not exist in their RHUs.

As stated by one respondent, “No problem because we have no equipment.” (Respond 20).

This response reflects the normalization of the absence of radiologic services in some RHUs.

Overall, the thematic analysis revealed that the Rural Health Units (RHUs) experience significant challenges in relation to radiologic facilities and services. The most dominant issue identified is the absence of radiologic equipment and facilities, resulting in the complete lack of radiologic services in many RHUs. Respondents also emphasized the shortage of trained personnel such as radiologic technologists and radiologists, which further limits service delivery. Moreover, the absence of facilities forces RHUs to rely heavily on referral systems, creating accessibility issues, delays in diagnosis, and financial burdens for patients who need to travel to distant hospitals or clinics. Infrastructure limitations, such as the absence of standard radiology rooms and facility readiness, were also identified as barriers to establishing radiologic services. Furthermore, some respondents expressed a sense of normalization regarding the absence of radiologic services, indicating that the lack of facilities has become an accepted condition in some RHUs.

SUGGESTIONS THAT CAN BE PROPOSED BY THE RESPONDENTS TO IMPROVE THE PRESENCE AND AVAILABILITY OF RADIOLOGIC FACILITIES IN THE SELECTED RURAL HEALTH UNITS

THEME 1: ACQUISITION OF RADIOLOGIC EQUIPMENT AND ESTABLISHMENT OF FACILITIES

The most prominent recommendation from respondents is the acquisition of radiologic equipment and the establishment of radiologic facilities in RHUs.

As stated by respondents, "Request for radiologic equipment." (Respond 3), "Put radiologic facility" (Respond 21), "to have radiologic facility in the RHU." (Respond 27), "Request x ray machine to IPHO or MOH." (Respond 30), and "Hoping someday RHU Pura will have radiology facility." (Respond 34).

These responses indicate a strong demand for accessible diagnostic imaging services within RHUs.

THEME 2: REQUEST FOR GOVERNMENT SUPPORT AND FUNDING

Many respondents emphasized the need for support and funding from government agencies such as LGUs, MOH, and IPHO.

This is evident in the responses, "Request from Municipality government for funding and establishment radiologic facilities." (Respond 12), "Strongly communicate to World Health Organization or Ministry of Health" (Respond 4), "request funds and support to the LGU for the equipment" (Respond 18), and "Advocate to the LGU and IPHO Maguindanao del Norte for capital outlay allocation" (Respond 24).

These responses suggest that financial and policy support are necessary for the establishment of radiologic facilities.

THEME 3: HIRING AND TRAINING OF QUALIFIED PERSONNEL

Another major theme is the need for trained radiologic personnel and staff development.

As stated by respondents, "Have manpower / radiologist, radtech" (Respond 3), "More trainings for RHU Staff." (Respond 11), "Availability of trained radiologic staff" (Respond 25), "Trained radiologic technologist should be hired." (Respond 28), and "We are hoping to have a licensed Radiologist in our RHU" (Respond 31).

These responses indicate that human resource development is essential in improving radiologic services.

THEME 4: IMPROVING ACCESSIBILITY OF RADIOLOGIC SERVICES

Respondents also emphasized making radiologic services more accessible to the community.

As stated by respondents, "Please provide radiology services for accessible services to our community." (Respond 8) and "I strongly recommend making radiologic services available at the RHU to improve accessibility for patients"

(Respond 29).

These responses highlight the importance of bringing healthcare services closer to patients.

THEME 5: PARTNERSHIPS, PROGRAMS, AND ALTERNATIVE SOLUTIONS

Some respondents suggested alternative approaches such as partnerships, outreach programs, and telemedicine.

As stated by respondents, “Explore public-private partnership arrangements” (Respond 24), “Active Case Finding by bringing x ray machines in our area” (Respond 26), and “Advocate for telemedicine-integrated radiologic (teleradiology)” (Respond 24).

These responses indicate that innovative approaches may help address limitations in RHUs.

THEME 6: STRENGTHENING REFERRAL SYSTEMS AND SUPPORT MECHANISMS

A few respondents emphasized improving referral systems and patient support.

As stated by respondents, “Established a formalized and documented referral pathway” (Respond 24) and “assistance for patients through MOOE funded transport support” (Respond 24).

These responses indicate that continuity of care remains important while facilities are still unavailable.

THEME 7: AWARENESS AND COMMUNITY EDUCATION

Some respondents emphasized promoting awareness regarding radiologic services.

As stated by one respondent, “Promote awareness educate the community about the availability and importance of radiologic services to increase utilization.” (Respond 16).

This response indicates that community education may improve healthcare utilization.

THEME 8: LIMITED SUGGESTIONS DUE TO ABSENCE OF SERVICES

A few respondents expressed limited suggestions because of the total absence of radiologic services.

As stated by respondents, “None. Due to the fact we have nothing to improve because of the total absence of the said services/facilities.” (Respond 15) and “None” (Respond 17).

These responses reflect the severe lack of resources in some RHUs.

Overall, the thematic analysis revealed that respondents strongly recommend the acquisition of radiologic equipment and the establishment of radiologic facilities within RHUs as the primary strategy for improvement. Respondents also emphasized the importance of government support and funding from agencies such as the Local Government Unit (LGU), Ministry of Health (MOH), and Integrated Provincial Health Office (IPHO) to sustain radiologic services. Another major recommendation is the hiring and training of qualified personnel, including radiologic technologists and radiologists, to ensure proper operation of the facilities.

Additionally, respondents highlighted the need to improve accessibility of radiologic services, especially for patients from remote communities. Some participants also suggested developing partnerships, outreach programs, and telemedicine-integrated radiologic services as alternative solutions while permanent facilities are still unavailable. Strengthening referral systems, transportation support, and community awareness programs were likewise identified as important measures to improve continuity of care and utilization of radiologic services. However, a few respondents expressed limited suggestions due to the complete absence of radiologic facilities in their RHUs.

Table 3

Relationship between the demographic profile and the assessment of radiologic facilities in selected Rural Health Units in Maguindanao del Norte

	A. presence of Radiologic Equipment				B. Availability of Radiologic Services			
	r	p	Interpretation	Decision	r	p	Interpretation	Decision
Age	-.096	.404	Not Significant	Accept Ho	-.149	.192	Not Significant	Accept Ho
Sex	-.263	.020	Significant	Reject Ho	-.047	.683	Not Significant	Accept Ho
Civil Status	-.183	.109	Not Significant	Accept Ho	-.084	.465	Not Significant	Accept Ho
Employment	-.061	.595	Not Significant	Accept Ho	-.055	.631	Not Significant	Accept Ho
Position	-.165	.150	Not Significant	Accept Ho	.081	.481	Not Significant	Accept Ho

	C. Maintenance of Radiologic Equipment				D. Availability of Human Resources			
	r	p	Interpretation	Decision	r	p	Interpretation	Decision
Age	-.110	.337	Not Significant	Accept Ho	.242	.033	Significant	Reject Ho
Sex	-.007	.954	Not Significant	Accept Ho	-.094	.414	Not Significant	Accept Ho
Civil Status	.076	.509	Not Significant	Accept Ho	-.137	.232	Not Significant	Accept Ho

Employment	.041	.719	Not Significant	Accept Ho	.028	.810	Not Significant	Accept Ho
Position	.125	.276	Not Significant	Accept Ho	-.062	.592	Not Significant	Accept Ho

	E. Compliance with DOH standards and Accreditation			
	r	P	Interpretation	Decision
Age	-.345	.002	Significant	Reject Ho
Sex	.039	.733	Not Significant	Accept Ho
Civil Status	-.179	.177	Not Significant	Accept Ho
Employment	.306	.006	Significant	Reject Ho
Position	-.070	.544	Not Significant	Accept Ho

Table 3 presents the relationship between the demographic profile and the assessment of radiologic facilities in selected Rural Health Units in Maguindanao del Norte. This further reveal that in terms of Presence of Radiologic Equipment, only sex shows a significant relationship with an r-value of -.263 and a p-value of .020, interpreted as Significant, thus the null hypothesis is rejected. On the other hand, age ($r = -.096$, $p = .404$), civil status ($r = -.183$, $p = .109$), employment ($r = -.061$, $p = .595$), and position ($r = -.165$, $p = .150$) are interpreted as Not Significant, thus the null hypothesis is accepted. These findings indicate that sex significantly influences the assessment of presence of radiologic equipment while the remaining demographic variables do not.

Moreover, in terms of Availability of Radiologic Services, all demographic variables including age ($r = -.149$, $p = .192$), sex ($r = -.047$, $p = .683$), civil status ($r = -.084$, $p = .465$), employment ($r = -.055$, $p = .631$), and position ($r = .081$, $p = .481$) are interpreted as Not Significant, thus the null hypothesis is accepted. Similarly, in terms of Maintenance of Radiologic Equipment, all variables namely age ($r = -.110$, $p = .337$), sex ($r = -.007$, $p = .954$), civil status ($r = .076$, $p = .509$), employment ($r = .041$, $p = .719$), and position ($r = .125$, $p = .276$) are interpreted as Not Significant, thus the null hypothesis is accepted. These results indicate that demographic profile does not significantly influence the assessment of availability of radiologic services and maintenance of radiologic equipment.

On the other hand, in terms of Availability of Human Resources, only age shows a significant relationship with an r-value of .242 and a p-value of .033, interpreted as Significant, thus the null hypothesis is rejected, while sex ($r = -.094$, $p = .414$), civil status ($r = -.137$, $p = .232$), employment ($r = .028$, $p = .810$), and position ($r = -.062$, $p = .592$) are interpreted as Not Significant, thus the null

hypothesis is accepted.

Furthermore, in terms of Compliance with DOH Standards and Accreditation, both age ($r = -.345$, $p = .002$) and employment ($r = .306$, $p = .006$) show significant relationships, interpreted as Significant, thus the null hypothesis is rejected. Meanwhile, sex ($r = .039$, $p = .733$), civil status ($r = -.179$, $p = .177$), and position ($r = -.070$, $p = .544$) are interpreted as Not Significant, thus the null hypothesis is accepted.

Overall, these findings reveal that only selected demographic variables such as sex, age, and employment show significant relationships in specific dimensions of radiologic facility assessment, while most demographic variables remain not significant.

DISCUSSION

Demographic Profile of Respondents

The findings revealed that the majority of respondents came from the UPI Rural Health Unit, indicating that most of the data gathered were contributed by healthcare personnel from the said municipality. This suggests that UPI RHU had greater representation and participation in the study, which may also imply a higher level of engagement and availability of healthcare workers within the area. The strong participation from UPI may reflect the active involvement of healthcare personnel in rural health service delivery and research-related activities.

In terms of age, respondents aged 40–49 years old comprised the highest percentage. This finding indicates that the majority of respondents belong to the middle-adulthood stage, suggesting that many healthcare workers already possess considerable professional experience, maturity, and practical knowledge in the healthcare field. Experienced personnel are often more capable of handling complex healthcare responsibilities and decision-making processes, which may contribute to the reliability and credibility of the responses gathered in the study. This finding supports the study of Abrigo (2019), which reported that the healthcare workforce in the Philippines is gradually aging, particularly among healthcare professionals in public service settings.

With regard to sex, female respondents overwhelmingly dominated the study population, while male respondents accounted for only a small proportion. This reflects the reality that healthcare services, particularly nursing and midwifery professions, are traditionally female-dominated fields. According to the Philippine Institute for Development Studies 2021, women continue to comprise the majority of healthcare workers, especially among nurses and midwives in the Philippines. Likewise, the World Health Organization reported that women account for approximately 70% of the global health and social care workforce, emphasizing the significant contribution of women in healthcare delivery. The predominance of female respondents in this study may therefore reflect the nurturing, caregiving, and patient-centered nature commonly associated with healthcare professions.

As to civil status, married respondents constituted the majority of the participants. This finding suggests that most healthcare workers in the study

have already established family responsibilities, which may influence their perspectives, work experiences, and level of commitment in performing their duties. Married employees are often perceived as more stable, responsible, and capable of balancing professional and personal obligations. Their life experiences may also contribute to improved interpersonal relationships and patient care practices in healthcare settings.

In terms of employment status, contractual employees ranked the highest among the respondents. This finding indicates that a significant portion of healthcare personnel are employed under contractual arrangements, which reflects the current workforce realities in many public healthcare institutions in the Philippines. According to Tejero et al. (2022), rural health units and local government units often experience difficulties in recruiting and retaining permanent healthcare workers because of limited financial resources and budget constraints. As a result, many healthcare workers are employed on a temporary or contractual basis. This condition may have implications for job security, workforce stability, employee motivation, and long-term retention of healthcare professionals in rural communities.

Regarding position, midwives represented the majority of the respondents. This finding highlights the essential role of midwives in the delivery of primary healthcare services, especially in rural communities where maternal and child healthcare programs are highly prioritized. Midwives are often considered frontline healthcare providers responsible for prenatal care, maternal health services, immunization support, and community-based health education. A study conducted on Rural Health Midwives in the Philippines (Dimog et al, 2023) emphasized that midwives play a crucial role in ensuring accessible healthcare services in geographically isolated and disadvantaged areas. Their strong representation in the study further emphasizes their vital contribution to the effectiveness of community health programs and rural healthcare delivery systems.

These demographic findings suggest that the respondents were predominantly female, married, middle-aged, contractual employees, and mostly midwives from the UPI Rural Health Unit. These characteristics indicate that the respondents possess relevant professional backgrounds and practical experiences that can provide meaningful and reliable information for the study. Furthermore, the demographic profile reflects the existing workforce composition in rural healthcare settings, particularly the strong participation of female healthcare professionals and midwives in delivering community-based health services. The findings also underscore the continuing challenges related to workforce staffing, employment stability, and healthcare personnel distribution within rural health institutions in the Philippines.

Status of radiologic equipment in terms of the presence of radiologic equipment in the selected Rural Health Units (RHUs).

The findings revealed an overall mean that was interpreted as “Disagree.” This indicates that respondents generally perceive that radiologic equipment and facilities are insufficient or lacking in the selected RHUs. The result implies that most RHUs are not adequately equipped with the necessary radiologic resources

needed to support efficient healthcare delivery and diagnostic services. The inadequacy of diagnostic equipment in rural healthcare settings remains a significant challenge, particularly in geographically isolated and underserved communities where access to advanced medical services is limited.

Among the indicators, statement 5, "The absence of radiologic equipment is evident in RHU," obtained the highest mean which interpreted as "Agree." This finding demonstrates that respondents strongly recognize the lack of radiologic equipment within their healthcare facilities. The relatively high standard deviation further suggests variations in responses, which may indicate that while some RHUs possess limited diagnostic equipment, many continue to experience serious shortages in radiologic resources. This finding is consistent with the study of Silva et al. (2021), which emphasized that healthcare facilities in low-resource and rural areas often face inadequate access to diagnostic imaging technologies due to financial limitations, insufficient infrastructure, and unequal distribution of healthcare resources.

The study noted that the absence of radiologic equipment significantly affects the capability of rural healthcare facilities to provide accurate and timely diagnosis for patients. This was followed by statement 3, "The availability of equipment meets basic diagnostic needs," which garnered a mean interpreted as "Strongly Disagree." This suggests that respondents believe the available radiologic equipment is inadequate to address even the most basic diagnostic requirements of patients. The inability to meet diagnostic needs may negatively affect the quality of healthcare services, delay diagnosis and treatment, and contribute to inefficiencies in patient management within RHUs.

According to the World Health Organization 2021, diagnostic imaging services such as X-ray and ultrasound are essential components of primary healthcare because they support early disease detection, accurate diagnosis, and proper treatment planning. However, many developing countries and rural health facilities continue to experience shortages of diagnostic imaging resources, limiting the effectiveness of healthcare delivery. On the other hand, statement 1, "The RHU has existing radiologic equipment (e.g., X-ray, Ultrasound)," and statement 4, "The RHU has complete basic radiologic facilities," both obtained the lowest mean interpreted as "Strongly Disagree." These findings clearly indicate that respondents perceive the RHUs as lacking essential radiologic equipment and complete radiologic facilities. The low standard deviation values imply consistency among respondents' perceptions regarding the absence of such facilities.

This finding supports the study conducted by Mollura et al. (2020), which reported that many rural and low-income healthcare facilities globally continue to experience limited access to basic imaging modalities such as X-ray and ultrasound due to inadequate government investment, maintenance challenges, and shortage of trained radiologic personnel. The absence of these essential facilities greatly affects healthcare accessibility and compromises the quality of patient care in underserved communities. Furthermore, the findings may also reflect broader healthcare system challenges in rural areas, including insufficient healthcare funding, limited procurement of medical equipment, and inequitable allocation of healthcare resources.

In the Philippines, rural healthcare institutions often face difficulties in obtaining advanced diagnostic technologies because of budgetary constraints and prioritization of other healthcare needs. As emphasized by the Department of Health and several healthcare studies, strengthening diagnostic capacity in primary healthcare facilities is essential in improving universal healthcare access and reducing healthcare disparities between urban and rural communities.

Overall, the findings suggest that radiologic equipment and facilities in the selected Rural Health Units remain inadequate. The absence of essential diagnostic equipment such as X-ray and ultrasound machines highlights a major challenge faced by RHUs in providing comprehensive healthcare services. The lack of complete radiologic facilities may hinder early detection, accurate diagnosis, and timely treatment of diseases, thereby affecting the overall quality of patient care. These findings underscore the urgent need for increased investment in radiologic infrastructure, procurement of essential diagnostic equipment, and strengthening of healthcare resources in rural health facilities. Improving radiologic services in RHUs can contribute significantly to better healthcare outcomes, more efficient patient management, and enhanced delivery of primary healthcare services in rural communities.

Status of radiologic equipment in terms of the availability of radiologic services in the selected Rural Health Units (RHUs).

The findings revealed an overall mean of interpreted as “Disagree.” This indicates that respondents generally perceive that radiologic services are not readily available in the selected RHUs. The result suggests that healthcare facilities in rural areas experience significant limitations in providing essential radiologic services necessary for patient diagnosis, monitoring, and treatment. The lack of accessible diagnostic imaging services in rural communities remains a major healthcare concern because radiologic procedures play a vital role in the early detection and management of diseases.

Among the indicators, statement 5, “Patients are referred to other facilities due to lack of services,” obtained the highest mean interpreted as “Agree.” This finding implies that patient referrals to other healthcare facilities are common because the RHUs are unable to adequately provide the necessary radiologic services. The high mean reflects the respondents’ strong acknowledgment of the inadequacy of radiologic services within their facilities. The relatively high standard deviation further indicates differences in experiences among respondents, possibly due to variations in service availability among RHUs. Some facilities may have minimal diagnostic capabilities, while others may completely lack radiologic services. This finding supports the study of Mollura et al. (2020), which emphasized that patients in low-resource and rural healthcare settings are frequently referred to higher-level healthcare institutions because of inadequate diagnostic imaging resources and limited healthcare infrastructure. The study further explained that lack of imaging services contributes to delayed diagnosis and treatment, particularly in underserved communities.

This was followed by statement 3, “Services are provided regularly without interruption,” which obtained a mean interpreted as “Strongly Disagree.” This

finding indicates that respondents believe radiologic services are not consistently available and are often interrupted or unavailable. Irregular service provision may negatively affect patient care, delay diagnosis, and create inconvenience for patients who rely on timely medical imaging procedures. According to the World Health Organization (WHO), continuous access to diagnostic imaging services is essential in strengthening primary healthcare systems and improving patient outcomes. However, healthcare facilities in rural and developing areas often encounter interruptions in radiologic services because of equipment shortages, inadequate maintenance, insufficient funding, and lack of trained personnel. These limitations reduce the efficiency of healthcare delivery and may compromise patient safety and treatment effectiveness.

On the other hand, statement 1, "Radiologic services are available in the RHU when needed," obtained the lowest mean interpreted as "Strongly Disagree." Similarly, statement 2, "Radiologic services are accessible to patients," garnered a mean also interpreted as "Strongly Disagree." These findings clearly indicate that radiologic services are perceived as inaccessible and unavailable within the RHUs. The low standard deviation values further suggest consistency in the respondents' perceptions regarding the lack of accessibility and availability of these services.

This finding is consistent with the report of the Lancet Commission on Diagnostics 2021, which highlighted that millions of people living in low- and middle-income countries continue to experience limited access to diagnostic services, particularly in rural healthcare settings. The report emphasized that inadequate diagnostic access contributes significantly to poor health outcomes, delayed disease management, and increased healthcare inequalities among vulnerable populations. The findings may also reflect broader challenges faced by rural healthcare institutions in the Philippines, including insufficient healthcare funding, lack of diagnostic infrastructure, and unequal distribution of healthcare services between urban and rural communities. Rural Health Units often rely on referrals to hospitals and private diagnostic centers because many RHUs lack essential imaging equipment and trained radiologic personnel. This situation may place additional financial and emotional burdens on patients, especially those residing in geographically isolated and disadvantaged areas where transportation and healthcare access are already limited.

Overall, the findings demonstrate that radiologic services in the selected Rural Health Units remain insufficient and inaccessible to many patients. The frequent referral of patients to other healthcare facilities highlights the inability of RHUs to provide continuous and adequate radiologic services. This condition may contribute to delayed diagnosis, additional healthcare expenses, inconvenience for patients, and overcrowding in referral hospitals or diagnostic centers. Furthermore, the lack of accessible radiologic services may compromise the quality and efficiency of healthcare delivery in rural communities. Therefore, the findings underscore the importance of strengthening radiologic service delivery in RHUs through improved healthcare infrastructure, procurement of essential diagnostic equipment, regular maintenance of facilities, and allocation of trained radiologic personnel. Enhancing radiologic services in rural healthcare facilities can significantly improve patient care, support timely diagnosis and treatment, and

promote equitable access to healthcare services in underserved communities.

Status of radiologic equipment in terms of the maintenance of radiologic equipment in the selected Rural Health Units (RHUs).

The findings revealed an overall mean interpreted as “Strongly Disagree.” This indicates that respondents generally perceive that maintenance practices for radiologic equipment are inadequate or largely absent in the selected RHUs. The findings suggest that proper upkeep, monitoring, servicing, and preventive maintenance of radiologic equipment are not consistently implemented, which may negatively affect the functionality, reliability, and efficiency of diagnostic services. Proper maintenance of radiologic equipment is essential in ensuring accurate diagnostic results, patient safety, and continuity of healthcare services. However, the findings imply that maintenance management systems in many RHUs remain weak and insufficient.

Among the indicators, statement 5, “Some equipment becomes non-functional due to poor maintenance,” obtained the highest mean interpreted as “Disagree.” Although interpreted as “Disagree,” the statement still reflects concerns regarding the condition of radiologic equipment and implies that poor maintenance practices may contribute to equipment malfunction in certain RHUs. The relatively high standard deviation further indicates varying experiences among respondents, possibly because maintenance practices differ across healthcare facilities. Some RHUs may have limited maintenance support, while others may entirely lack technical servicing and repair systems.

This finding is consistent with the study of Malkin and Keane (2010), which revealed that a large percentage of medical equipment in low-resource healthcare settings becomes non-functional because of inadequate maintenance systems, lack of spare parts, and insufficient technical expertise. The study emphasized that ineffective maintenance programs significantly reduce the operational lifespan of medical equipment and compromise healthcare delivery. This was followed by statement 1, “Radiologic equipment undergoes regular maintenance,” which garnered a mean interpreted as “Strongly Disagree.” This finding indicates that respondents generally believe that regular maintenance procedures are not being conducted in the RHUs. The absence of routine preventive maintenance may increase the likelihood of equipment deterioration, service interruptions, inaccurate diagnostic results, and unexpected equipment failures.

According to the World Health Organization (WHO), preventive maintenance is an essential component of healthcare technology management because it helps ensure the safety, accuracy, and reliability of diagnostic equipment. The WHO further emphasized that healthcare facilities should implement scheduled maintenance programs and regular servicing to maximize equipment efficiency and minimize operational downtime. On the other hand, statement 3, “Repairs are addressed promptly,” obtained the lowest mean interpreted as “Strongly Disagree.” This was followed by statement 2, “Equipment is inspected periodically,” with a mean also interpreted as “Strongly Disagree.” These findings suggest that repair and inspection mechanisms are insufficient within the RHUs.

Delayed repairs and lack of periodic inspection may further contribute to the decline in equipment performance and operational efficiency. Inadequate inspection and repair systems may also increase the risk of inaccurate diagnostic procedures and prolonged service interruptions, which can negatively affect patient care. This finding supports the study conducted by Perry and Malkin (2011), which found that healthcare facilities in developing countries commonly experience delays in equipment repair because of limited financial resources, lack of biomedical engineers, and inadequate technical support systems. As a result, many diagnostic devices remain unused or non-functional for extended periods.

Furthermore, the findings may reflect broader challenges within rural healthcare systems, including insufficient funding for healthcare technology management, limited access to trained maintenance personnel, and inadequate prioritization of equipment servicing programs. Rural healthcare facilities often face difficulties in sustaining radiologic equipment because maintenance services and technical support are usually concentrated in urban hospitals and specialized healthcare institutions. Without proper maintenance and inspection programs, radiologic equipment may deteriorate more rapidly, reducing the quality and accessibility of diagnostic services in rural communities.

Overall, the findings indicate that maintenance systems for radiologic equipment in the selected Rural Health Units are weak and inadequate. The lack of regular maintenance, prompt repair, and periodic inspection may lead to equipment breakdowns, interruptions in healthcare services, inaccurate diagnostic outcomes, and reduced efficiency in patient diagnosis and treatment. These conditions may ultimately compromise the quality of healthcare delivery and patient safety within rural healthcare settings. Therefore, the findings emphasize the importance of establishing effective maintenance programs, allocating sufficient financial resources for equipment servicing, and implementing regular inspection schedules to ensure the proper functioning, safety, and longevity of radiologic equipment in RHUs. Strengthening equipment maintenance practices can contribute significantly to improved healthcare service delivery, enhanced diagnostic accuracy, and better patient outcomes in rural communities.

Status of radiologic equipment in terms of the availability of human resources in the selected Rural Health Units (RHUs)

The findings revealed an overall mean interpreted as “Strongly Disagree.” This indicates that respondents generally perceive that RHUs lack adequate and qualified human resources necessary for radiologic services. The findings suggest that staffing limitations and the shortage of trained personnel significantly affect the delivery of radiologic services in rural healthcare facilities. Human resources are considered one of the most important components of healthcare delivery because qualified personnel are essential in ensuring accurate diagnostic procedures, safe equipment operation, and efficient patient care.

However, the findings imply that many RHUs continue to experience difficulties in maintaining an adequate workforce for radiologic services. Among the indicators, statement 5, “There is a shortage of trained personnel in the RHU,” obtained the highest mean interpreted as “Disagree.” Despite the interpretation,

the result still reflects concerns regarding the shortage of trained personnel in RHUs. The relatively high standard deviation further indicates varied responses among participants, which may imply that some RHUs have slightly better staffing conditions than others, although shortages remain evident overall. This finding supports the report of the World Health Organization (WHO), which emphasized that healthcare workforce shortages remain a major challenge in low- and middle-income countries, particularly in rural and underserved communities.

The WHO reported that inadequate numbers of trained healthcare professionals significantly limit the delivery of essential healthcare services, including diagnostic imaging and radiologic procedures. This was followed by statement 4, "Staff are knowledgeable about radiologic procedures," which garnered a mean, interpreted as "Strongly Disagree." This finding indicates that respondents generally believe that staff members lack sufficient knowledge and expertise regarding radiologic procedures. Limited knowledge among healthcare personnel may affect the quality, safety, and effectiveness of radiologic services provided to patients. Improper handling of radiologic equipment and insufficient understanding of diagnostic procedures may also increase the risk of inaccurate imaging results, equipment damage, and patient safety concerns.

According to a study conducted by Mollura et al. (2020), inadequate training and lack of specialized radiologic personnel are among the primary barriers affecting the sustainability of radiologic services in low-resource healthcare settings. The study emphasized that continuous professional training and technical education are essential in strengthening diagnostic imaging services in rural communities. On the other hand, statement 2, "The RHU has sufficient staff for radiologic services," obtained the lowest mean interpreted as "Strongly Disagree." Similarly, statement 1, "There are qualified personnel to operate radiologic equipment," and statement 3, "Personnel are trained in handling radiologic equipment," both obtained a mean also interpreted as "Strongly Disagree." These findings indicate that RHUs generally lack sufficient staffing and trained personnel capable of operating and managing radiologic equipment effectively. The consistent responses among respondents suggest a common perception that human resource limitations are a significant concern within rural healthcare facilities.

This finding aligns with the study of Anyangwe and Mtonga (2007), which highlighted that many developing countries experience serious shortages of healthcare professionals because of workforce migration, unequal distribution of personnel, and limited opportunities for specialized healthcare training. Rural healthcare facilities are often the most affected because healthcare workers tend to prefer urban areas where resources, compensation, and career opportunities are more available. Furthermore, the findings may also reflect broader healthcare workforce challenges in the Philippines, particularly in geographically isolated and disadvantaged areas where shortages of healthcare professionals remain common.

Rural Health Units frequently experience limited staffing because of budgetary constraints, insufficient plantilla positions, and difficulties in recruiting and retaining trained healthcare workers. In many rural communities, healthcare

personnel are often required to perform multiple responsibilities beyond their area of specialization, which may further affect the efficiency and quality of healthcare services. Overall, the findings reveal that the selected Rural Health Units face significant challenges in terms of human resources for radiologic services. The shortage of qualified and trained personnel limits the ability of RHUs to provide efficient, safe, and reliable diagnostic services. Inadequate staffing and insufficient training may also increase the risk of operational inefficiencies, delayed patient care, inaccurate diagnostic procedures, and improper handling of radiologic equipment.

These findings highlight the importance of strengthening workforce development through the recruitment of qualified personnel, implementation of continuous professional training programs, and establishment of capacity-building initiatives to improve the quality and accessibility of radiologic services in RHUs. Enhancing the competency and availability of healthcare personnel can significantly contribute to improved healthcare delivery, patient safety, and diagnostic efficiency in rural healthcare settings.

The status of radiologic equipment in terms of compliance with Department of Health (DOH) standards and accreditation in the selected Rural Health Units (RHUs).

The findings revealed an overall mean interpreted as “Strongly Disagree.” This indicates that respondents generally perceive that the selected RHUs do not adequately comply with DOH standards and accreditation requirements related to radiologic facilities and services. The findings suggest that compliance measures, regulatory standards, safety requirements, and accreditation practices remain insufficient in many RHUs. Compliance with healthcare regulations and accreditation standards is essential in ensuring quality healthcare delivery, patient safety, and effective radiologic practices.

However, the findings imply that many rural healthcare facilities continue to face difficulties in meeting these standards because of limited resources, insufficient equipment, and lack of institutional support. Among the indicators, statement 5, “The RHU undergoes inspection for DOH compliance,” obtained the highest mean interpreted as “Disagree.” This finding implies that inspections for DOH compliance are not consistently conducted in RHUs. The relatively high standard deviation indicates differences in respondents’ experiences, which may suggest that some RHUs undergo inspections while others rarely experience compliance monitoring. Regular inspections are important in ensuring that healthcare facilities adhere to established operational and safety standards.

According to the World Health Organization (WHO), effective regulatory systems and routine monitoring are necessary to maintain quality healthcare services and ensure that diagnostic facilities comply with patient safety standards. Inadequate inspection mechanisms may contribute to poor implementation of radiologic regulations and increase the risk of unsafe healthcare practices. This was followed by statement 1, “The RHU follows DOH standards for radiologic facilities,” which garnered a mean interpreted as “Strongly Disagree.” This result indicates that respondents generally believe that RHUs are not fully implementing

the standards required for radiologic facilities. Failure to comply with DOH standards may affect the quality, safety, and effectiveness of radiologic services provided to patients. Healthcare standards are designed to ensure that diagnostic procedures are performed accurately, safely, and consistently across healthcare institutions.

The findings support the study conducted by Mollura et al. (2020), which emphasized that healthcare facilities in low-resource settings often experience challenges in complying with radiologic standards because of inadequate infrastructure, lack of technical expertise, and limited government support. The study further explained that poor compliance with radiologic standards may compromise diagnostic accuracy and patient safety. On the other hand, statement 4, "Safety equipment (e.g., lead aprons, warning signs) are available," obtained the lowest mean interpreted as "Strongly Disagree." This was followed by statement 3, "Required licenses and accreditations are complied with," which obtained a mean also interpreted as "Strongly Disagree." These findings indicate that RHUs lack essential safety equipment and experience poor compliance with licensing and accreditation requirements.

The absence of adequate safety equipment may expose healthcare workers and patients to potential radiation hazards and compromise the safety of radiologic procedures. Protective devices such as lead aprons, radiation shields, and warning signs are necessary to minimize radiation exposure and ensure compliance with radiation protection standards. According to the International Atomic Energy Agency (IAEA), radiation protection and safety measures are fundamental requirements in diagnostic imaging facilities to protect both patients and healthcare personnel from unnecessary radiation exposure. Failure to provide safety equipment and comply with accreditation requirements may increase occupational hazards and reduce the quality of healthcare services.

Furthermore, the findings may also reflect broader healthcare system challenges in rural areas, including inadequate funding for healthcare infrastructure, insufficient regulatory monitoring, and limited access to accreditation programs. Rural healthcare facilities often face difficulties in meeting compliance standards because resources are frequently concentrated in urban hospitals and specialized healthcare institutions. Limited financial capacity may prevent RHUs from procuring safety equipment, upgrading facilities, and securing necessary licenses and certifications for radiologic services. Overall, the findings demonstrate that compliance with DOH standards and accreditation requirements for radiologic services in the selected Rural Health Units remains inadequate. The lack of regular inspections, insufficient safety equipment, and poor compliance with licensing and accreditation standards may negatively affect the quality, safety, and reliability of radiologic services. These conditions may increase the risk of radiation hazards, compromise patient safety, and reduce the effectiveness of diagnostic procedures.

Therefore, the findings emphasize the need for stricter implementation of DOH regulations, regular compliance monitoring, provision of adequate safety equipment, and improvement of accreditation practices to ensure safe, effective, and standardized radiologic services in RHUs. Strengthening compliance systems

and promoting adherence to regulatory standards can significantly contribute to improved healthcare quality, enhanced patient safety, and more efficient delivery of radiologic services in rural healthcare settings.

Overall, the study findings revealed that the status of radiologic equipment and services in the selected Rural Health Units (RHUs) remains inadequate in terms of equipment availability, service accessibility, maintenance practices, human resources, and compliance with Department of Health (DOH) standards and accreditation requirements. Across all indicators, respondents consistently expressed negative perceptions, as reflected by the low overall mean scores interpreted mostly as “Disagree” and “Strongly Disagree.” These findings suggest that RHUs continue to face significant challenges in providing effective and reliable radiologic services to rural communities. In terms of the presence of radiologic equipment, respondents generally disagreed that RHUs possess sufficient radiologic facilities and diagnostic equipment. The findings revealed that many RHUs lack essential imaging tools such as X-ray and ultrasound machines, preventing healthcare facilities from meeting basic diagnostic needs. Respondents also strongly acknowledged the evident absence of radiologic equipment in their RHUs. This result supports the findings of Hinrichs-Krapels et al. (2023), which identified poor infrastructure, inadequate equipment, and limited resources as major barriers in delivering radiology services in low-resource and rural healthcare settings.

The World Health Organization (WHO) also emphasized that diagnostic imaging is an essential component of healthcare because it supports timely disease detection, diagnosis, and treatment planning, particularly in underserved and rural areas. Similarly, the findings regarding the availability of radiologic services showed that these services are generally inaccessible and unavailable within RHUs. Respondents noted that patients are frequently referred to other healthcare facilities due to the absence of radiologic services. This indicates that RHUs are unable to provide continuous and sufficient diagnostic support for patients in rural communities. These findings are consistent with studies showing that rural populations often experience limited access to imaging services due to shortages in staff, equipment, and healthcare infrastructure. According to Lyon et al. (2015), as cited in rural radiology research, nearly one-fourth of emergency transfers from rural hospitals were associated with lack of radiologic services, particularly the absence of available radiologists and imaging equipment.

The lack of accessible radiologic services may contribute to delayed diagnosis, additional transportation expenses, inconvenience to patients, and overcrowding in referral hospitals. The study also revealed serious concerns regarding the maintenance of radiologic equipment. Respondents strongly disagreed that regular maintenance, periodic inspection, and prompt repair systems are effectively implemented within RHUs. These findings indicate that maintenance practices remain weak and insufficient. Poor maintenance systems may result in equipment malfunction, interruptions in radiologic services, and reduced reliability of diagnostic procedures. Research conducted in Zambia by Ng'andwe and Bwanga (2022) similarly found that imaging services in rural healthcare facilities are negatively affected by inadequate maintenance systems,

bureaucratic procurement processes, and weak supply management for equipment and consumables.

The study further emphasized that lack of financial resources and technical support contributes to equipment deterioration and service inefficiency in rural healthcare settings. In terms of human resources, the findings further revealed that RHUs experience shortages of qualified and trained personnel for radiologic services. Respondents strongly disagreed that there are sufficient staff members capable of operating radiologic equipment and performing radiologic procedures effectively. They also perceived that healthcare personnel lack adequate knowledge and training regarding radiologic services. These findings support existing literature which states that rural healthcare facilities commonly experience shortages of radiologists, radiologic technologists, and trained healthcare professionals. The shortage of qualified personnel limits the efficiency, safety, and quality of radiologic services and may contribute to delays in patient care and improper equipment handling. Workforce limitations in rural settings are also linked to low staff retention, limited opportunities for professional development, and unequal distribution of healthcare workers between urban and rural areas.

Furthermore, compliance with DOH standards and accreditation requirements was found to be inadequate among the selected RHUs. Respondents strongly disagreed that their facilities consistently comply with standards concerning radiologic safety, licensing, accreditation, and availability of protective equipment such as lead aprons and warning signs. These findings indicate weaknesses in regulatory implementation and monitoring of radiologic practices within RHUs. The WHO highlighted that improving medical imaging capacity requires strong regulatory systems, safety standards, and compliance monitoring to ensure quality and equitable healthcare services. Inadequate compliance with safety and accreditation standards may expose healthcare personnel and patients to unnecessary radiation risks and compromise the quality and reliability of diagnostic services. Taken as a whole, the findings suggest that the selected Rural Health Units face multiple and interconnected challenges in establishing and sustaining effective radiologic services. The absence of adequate equipment, limited service accessibility, poor maintenance systems, shortage of trained personnel, and insufficient compliance with DOH standards collectively weaken the capability of RHUs to deliver quality healthcare services. These deficiencies may negatively affect patient outcomes, delay diagnosis and treatment, and reduce the overall efficiency of healthcare delivery in rural communities.

The findings of the study strongly emphasize the need for comprehensive interventions to strengthen radiologic services in RHUs. Such interventions may include procurement of essential imaging equipment, improvement of healthcare infrastructure, implementation of regular maintenance and inspection programs, recruitment and continuous training of qualified personnel, and stricter enforcement of DOH standards and accreditation requirements. Moreover, studies suggest that innovative strategies such as digital imaging systems, tele-radiology, and mobile radiologic services may help improve healthcare access in underserved rural communities. Strengthening these areas may significantly

improve diagnostic capabilities, patient safety, healthcare accessibility, and the overall quality of healthcare services provided in Rural Health Units.

THEMATIC ANALYSIS

PROBLEMS ENCOUNTERED BY THE SELECTED RURAL HEALTH UNITS IN MAGUINDANAO DEL NORTE IN RELATION TO RADIOLOGIC FACILITIES AND SERVICES

The findings revealed that the selected Rural Health Units (RHUs) in Maguindanao del Norte experience significant challenges in relation to radiologic facilities and services. Through thematic analysis, several recurring issues emerged, namely the absence of radiologic equipment and facilities, lack of radiologic services, shortage of trained personnel, dependence on referral systems, delays in diagnosis and financial burden, lack of infrastructure readiness, and the normalization of the absence of radiologic services. These findings demonstrate how the lack of diagnostic imaging resources continues to affect the quality and accessibility of healthcare services in rural communities.

The most dominant problem identified by the respondents was the complete absence of radiologic equipment and facilities in the RHUs. Most respondents emphasized that their facilities do not possess even the most basic imaging equipment such as X-ray machines or ultrasound devices. The absence of these facilities greatly limits the capability of RHUs to provide immediate and accurate diagnostic services to patients. Without radiologic equipment, healthcare providers are unable to conduct essential diagnostic procedures necessary for confirming medical conditions, monitoring diseases, and guiding treatment plans. This finding highlights the disparity between rural healthcare facilities and larger healthcare institutions that have more advanced diagnostic capabilities. The lack of equipment suggests inadequate healthcare investment and limited allocation of resources toward rural diagnostic services.

Closely related to the absence of equipment is the lack of radiologic services offered in the RHUs. Since many RHUs do not possess radiologic equipment, respondents explained that radiologic services are entirely unavailable in their facilities. This indicates that patients in these communities are deprived of essential imaging services that are commonly considered part of basic healthcare. The absence of radiologic services negatively affects healthcare delivery because healthcare providers are forced to rely solely on physical assessment and clinical judgment without the support of diagnostic imaging. This limitation may reduce the accuracy of diagnosis and delay appropriate interventions. The findings further suggest that the inability of RHUs to provide radiologic services contributes to unequal access to healthcare among rural populations.

Another important issue identified in the study is the shortage of trained personnel capable of handling radiologic procedures and equipment. Respondents emphasized the absence of radiologic technologists, radiologists, and trained healthcare workers in their RHUs. Even if radiologic equipment were to become available, the lack of qualified personnel would still hinder the operation and sustainability of radiologic services. This finding demonstrates that human resource limitations remain a major challenge in rural healthcare systems. Trained

professionals are essential not only for operating imaging equipment but also for ensuring patient safety, maintaining image quality, and interpreting diagnostic results. The shortage of skilled personnel may be attributed to limited training opportunities, workforce shortages, and the difficulty of retaining healthcare professionals in geographically isolated and disadvantaged areas.

The study also revealed that RHUs heavily depend on referral systems because patients must travel to hospitals or clinics outside their communities to access radiologic services. Respondents described the difficulties encountered when referring patients to distant facilities, particularly for residents living in geographically isolated and disadvantaged areas. This dependence on referrals creates accessibility challenges, especially for patients who lack transportation or financial resources. Long travel distances may discourage patients from seeking diagnostic procedures, resulting in incomplete medical evaluation and delayed treatment. The findings imply that the absence of radiologic services within RHUs weakens the efficiency of primary healthcare delivery and increases the burden on referral hospitals.

In addition, respondents emphasized that the lack of radiologic facilities contributes to delays in diagnosis and creates financial burdens for patients. Since patients are referred to distant hospitals or private clinics for imaging procedures, they often incur transportation expenses and additional healthcare costs. Some respondents noted that many patients cannot afford the travel expenses or fail to complete referrals because of financial constraints. As a result, healthcare providers sometimes manage patients without the necessary imaging confirmation, which may compromise the quality of care and patient outcomes. Delayed diagnosis may worsen medical conditions, prolong illness, and increase the risk of complications. This finding underscores the relationship between healthcare accessibility and socioeconomic challenges faced by rural populations.

Another theme identified in the study is the lack of infrastructure and facility readiness for radiologic services. Some respondents stated that their RHUs do not have designated rooms or standard facilities required for radiologic procedures. Radiologic services require appropriate infrastructure to ensure radiation safety, proper equipment installation, and compliance with healthcare standards. The absence of suitable infrastructure indicates that many RHUs are not yet prepared to establish or sustain radiologic services. This finding suggests that improving radiologic healthcare in rural areas requires not only equipment acquisition but also infrastructure development and facility enhancement.

Furthermore, the study revealed a concerning theme regarding the normalization of the absence of radiologic services in some RHUs. A few respondents expressed that there were “no problems” because their facilities never had radiologic equipment or services in the first place. This response reflects how the prolonged absence of diagnostic imaging services has become accepted as a normal condition within certain rural healthcare settings. Such normalization may reduce urgency among stakeholders to advocate for improvements and may contribute to the continued neglect of rural diagnostic healthcare needs.

Overall, the findings of the study demonstrate that the selected RHUs in

Maguindanao del Norte face multiple and interconnected challenges related to radiologic facilities and services. The absence of radiologic equipment, lack of trained personnel, inadequate infrastructure, and dependence on referral systems collectively hinder the delivery of effective healthcare services in rural communities. These limitations contribute to delayed diagnosis, financial burden, and reduced access to quality healthcare among patients. The findings highlight the urgent need for healthcare development initiatives aimed at improving radiologic facilities, strengthening workforce capacity, enhancing infrastructure, and expanding accessible diagnostic services within RHUs.

SUGGESTIONS THAT CAN BE PROPOSED BY THE RESPONDENTS TO IMPROVE THE PRESENCE AND AVAILABILITY OF RADIOLOGIC FACILITIES IN THE SELECTED RURAL HEALTH UNITS

The thematic analysis of the respondents' suggestions revealed that the improvement of radiologic facilities and services in the selected Rural Health Units (RHUs) requires comprehensive strategies involving infrastructure development, government support, workforce enhancement, service accessibility, partnerships, referral systems, and community awareness. The findings demonstrate that respondents recognize the importance of strengthening diagnostic imaging services as an essential component of healthcare delivery in rural communities. The most prominent recommendation among respondents was the acquisition of radiologic equipment and the establishment of radiologic facilities within RHUs. Many respondents expressed the need for X-ray machines, ultrasound equipment, and dedicated radiologic facilities to improve healthcare services in their respective areas.

This finding highlights the strong demand for accessible diagnostic imaging services in rural communities. According to the World Health Organization (WHO), diagnostic imaging services are essential for accurate disease detection, clinical decision-making, and treatment planning, particularly in primary healthcare settings and underserved communities. The WHO further emphasized that the lack of imaging facilities in rural areas contributes to delayed diagnosis and poor healthcare outcomes (World Health Organization, 2023). Similarly, DeStigter et al. (2021) noted that the availability of imaging equipment in low-resource healthcare systems significantly improves healthcare accessibility and patient management. These studies support the respondents' recommendations regarding the urgent need to establish radiologic facilities within RHUs. Another major theme identified was the request for government support and funding from agencies such as the Local Government Unit (LGU), Ministry of Health (MOH), and Integrated Provincial Health Office (IPHO).

Respondents emphasized that financial assistance and policy support are necessary to establish and sustain radiologic services. This finding is consistent with previous studies indicating that insufficient healthcare funding remains one of the major barriers to the development of radiologic infrastructure in rural areas. Hinrichs-Krapels et al. (2023) found that limited financial investment, inadequate infrastructure, and poor resource allocation significantly affect the delivery of radiologic services in low-resource healthcare facilities. Likewise, the WHO

emphasized that government commitment and sustainable financing are critical in strengthening diagnostic imaging systems and ensuring equitable healthcare access across communities. These findings suggest that strong collaboration between RHUs and government institutions is essential for improving radiologic services. The thematic analysis also revealed the need for hiring and training qualified personnel such as radiologists and radiologic technologists.

Respondents highlighted the importance of workforce development and continuous staff training to ensure effective operation of radiologic equipment and delivery of quality healthcare services. This finding supports existing literature stating that shortages of trained healthcare professionals are among the primary challenges affecting rural healthcare systems. According to Radiology Today (2019), many rural healthcare facilities experience limited access to radiologists and radiologic technologists, resulting in inadequate diagnostic services and delayed patient care. Additionally, studies have shown that continuous professional development and skills training improve healthcare workers' competency, service efficiency, and patient safety. The shortage of qualified personnel in RHUs therefore emphasizes the importance of recruitment programs, training opportunities, and capacity-building initiatives to strengthen radiologic services.

Another important theme focused on improving accessibility of radiologic services to rural communities. Respondents strongly recommended making radiologic services available within RHUs to minimize the need for patients to travel long distances to referral hospitals. This finding reflects the continuing healthcare disparities experienced by rural populations, particularly in accessing diagnostic services. According to the WHO, limited accessibility to imaging services in rural areas contributes to delayed diagnosis, increased healthcare costs, and poorer health outcomes among vulnerable populations. Furthermore, studies on rural healthcare systems indicate that accessible diagnostic services improve early disease detection and reduce patient burden associated with transportation and referral expenses. These findings support the respondents' recommendation to bring radiologic services closer to communities to improve healthcare utilization and patient outcomes. Respondents also suggested alternative approaches such as partnerships, outreach programs, and telemedicine-integrated radiologic services. Some participants recommended public-private partnerships, mobile X-ray services, and teleradiology systems to address the lack of permanent radiologic facilities.

These findings are supported by studies emphasizing the effectiveness of innovative healthcare delivery strategies in underserved areas. According to a study published in Diagnostics (2025), tele-radiology and digital imaging technologies help improve access to diagnostic services in remote communities by allowing radiologic images to be interpreted by specialists from distant locations. Similarly, mobile radiologic services and outreach programs have been identified as effective interventions in improving healthcare accessibility for geographically isolated populations. These innovative approaches may therefore help RHUs address current limitations while awaiting permanent infrastructure development.

Another theme emphasized the importance of strengthening referral

systems and patient support mechanisms. Respondents suggested formalizing referral pathways and providing transportation assistance for patients requiring radiologic procedures outside the RHU. This finding indicates the need to maintain continuity of care despite the absence of local radiologic facilities. Research has shown that effective referral systems improve coordination of healthcare services, reduce delays in treatment, and enhance patient outcomes. Additionally, transportation support programs are considered essential in rural healthcare settings where patients often face financial and geographical barriers in accessing specialized services. Strengthening referral networks may therefore help RHUs provide more efficient and patient-centered healthcare services. The findings also highlighted the importance of awareness and community education regarding radiologic services. One respondent emphasized the need to educate the community about the availability and significance of radiologic services to encourage healthcare utilization.

Community awareness programs are important because they improve public understanding of preventive healthcare, early diagnosis, and the benefits of diagnostic imaging. Studies suggest that health education campaigns contribute to increased healthcare-seeking behavior and improved utilization of medical services, particularly in rural and underserved communities. However, a few respondents expressed limited suggestions due to the total absence of radiologic facilities and services in their RHUs. These responses reflect the severe lack of resources and infrastructure in certain healthcare facilities. The inability of some respondents to propose improvements demonstrates the extent of the challenges faced by RHUs in delivering radiologic services. This finding further supports existing literature indicating that healthcare systems in low-resource rural areas continue to struggle with inadequate infrastructure, insufficient equipment, and limited workforce capacity.

Overall, the thematic analysis revealed that respondents strongly recommend the establishment of radiologic facilities, acquisition of imaging equipment, increased government funding, workforce development, and implementation of innovative healthcare strategies to improve radiologic services in RHUs. The findings are consistent with published studies and international healthcare recommendations emphasizing the importance of accessible diagnostic imaging services in strengthening primary healthcare systems. Improving radiologic services in RHUs may significantly enhance early disease detection, patient management, healthcare accessibility, and overall quality of healthcare delivery in rural communities.

Table 3 presents the relationship between the demographic profile of respondents and their assessment of radiologic facilities in selected Rural Health Units (RHUs) in Maguindanao del Norte. The findings revealed that only selected demographic variables showed significant relationships with specific dimensions of radiologic facility assessment, while most demographic factors were found to have no significant relationship. These results suggest that demographic characteristics may influence perceptions of radiologic facilities only in certain aspects, while assessments in general remain relatively consistent across respondents. The predominance of non-significant relationships indicates that the

problems associated with radiologic facilities are widely experienced across RHUs regardless of respondents' demographic background.

In terms of the presence of radiologic equipment, sex was found to have a significant relationship with the respondents' assessment, indicating that male and female respondents differed in their perceptions regarding the availability of radiologic equipment within RHUs. This finding may be associated with differences in professional experiences, work responsibilities, and exposure to radiologic procedures between male and female healthcare personnel. According to the study of Newman (2014), gender differences in healthcare workplaces may influence employees' perceptions, attitudes, and evaluations of healthcare services due to variations in occupational roles and clinical responsibilities. Female healthcare workers, particularly nurses and midwives, are often more directly involved in patient care and frontline service delivery, which may affect their awareness of equipment limitations and service deficiencies within healthcare facilities.

However, age, civil status, employment status, and position were all found to have no significant relationship with the assessment of radiologic equipment. This implies that respondents generally shared similar perceptions regarding the lack or inadequacy of radiologic equipment regardless of their demographic background. The finding supports the idea that the absence of radiologic equipment is a common concern experienced across RHUs and recognized uniformly by healthcare personnel. This is consistent with studies emphasizing that rural healthcare facilities commonly experience shortages of diagnostic imaging equipment because of inadequate healthcare funding, poor infrastructure, and unequal distribution of medical resources. Since these challenges affect healthcare facilities broadly, healthcare workers tend to develop similar perceptions regarding equipment inadequacy regardless of demographic characteristics.

With regard to the availability of radiologic services, all demographic variables were found to be not significant. This indicates that respondents, regardless of age, sex, civil status, employment status, or position, shared similar assessments regarding the accessibility and availability of radiologic services in RHUs. The uniformity of responses suggests that the lack of radiologic services is a widespread issue affecting all healthcare personnel and communities served by the RHUs. This finding is consistent with the report of the World Health Organization (WHO), which emphasized that rural healthcare facilities in many developing countries experience limited access to diagnostic imaging services due to shortages in infrastructure, equipment, and trained personnel. Because these limitations are commonly experienced across healthcare settings, perceptions regarding service availability tend to remain similar among healthcare workers regardless of demographic background.

Similarly, the findings revealed that demographic variables did not significantly influence respondents' assessment of maintenance of radiologic equipment. Age, sex, civil status, employment status, and position all showed no significant relationship with equipment maintenance. This suggests that respondents consistently perceived maintenance practices as inadequate

regardless of their demographic profile. The findings imply that problems related to maintenance, inspection, and repair of radiologic equipment are common concerns within RHUs. This finding supports the study conducted by Malkin and Keane (2010), which reported that healthcare facilities in low-resource settings frequently experience insufficient maintenance systems because of limited funding, lack of technical expertise, and inadequate infrastructure support.

The consistent responses among respondents may therefore reflect shared experiences regarding weak maintenance systems in RHUs. On the other hand, age showed a significant relationship with the assessment of availability of human resources. This finding indicates that respondents from different age groups varied in their perceptions regarding the adequacy of trained personnel and workforce availability for radiologic services. Older respondents may possess greater professional experience and exposure to healthcare service delivery, allowing them to assess staffing conditions differently compared to younger personnel. According to the study of Sharma and Dhar (2016), professional experience and age may influence healthcare workers' perceptions regarding workforce adequacy, organizational effectiveness, and service quality because experienced personnel tend to have broader exposure to healthcare operations and institutional challenges.

However, sex, civil status, employment status, and position were found to have no significant relationship with the assessment of human resources. This indicates that most respondents, regardless of these demographic characteristics, generally agreed on the shortage of trained radiologic personnel within RHUs. The findings support the report of the World Health Organization on Human Resources for Health, which emphasized that healthcare workforce shortages remain a common challenge in rural and underserved communities, affecting healthcare delivery systems regardless of demographic factors among personnel. Furthermore, the findings revealed that both age and employment status showed significant relationships with compliance with Department of Health (DOH) standards and accreditation.

This suggests that respondents' perceptions regarding compliance with safety standards, licensing requirements, and accreditation practices differ according to age and employment classification. Older respondents may have more familiarity with institutional policies, healthcare regulations, and accreditation procedures due to longer years of service. Likewise, employment status may influence respondents' awareness and involvement in organizational compliance processes. Permanent employees, for example, may have greater exposure to administrative policies and regulatory requirements compared to contractual or temporary staff. According to the World Health Organization, healthcare workers who are more involved in institutional governance and administrative processes are more likely to possess greater awareness of regulatory compliance and accreditation systems.

Meanwhile, sex, civil status, and position were found to have no significant relationship with compliance assessment, indicating similar perceptions among respondents regardless of these demographic characteristics. This suggests that issues related to compliance with DOH standards and accreditation are recognized

as institutional concerns affecting RHUs as a whole rather than problems limited to specific groups of healthcare workers. Overall, the findings demonstrate that only selected demographic variables such as sex, age, and employment status significantly influenced specific aspects of radiologic facility assessment, while the majority of demographic variables showed no significant relationship. The predominance of non-significant results suggests that respondents generally shared common experiences and perceptions regarding the inadequacy of radiologic facilities and services in RHUs.

This consistency of responses may indicate that the challenges affecting radiologic services—such as lack of equipment, limited accessibility, inadequate maintenance, shortage of trained personnel, and insufficient compliance with standards—are systemic issues experienced throughout the RHUs regardless of demographic background. The findings further emphasize the need for institutional and structural improvements rather than demographic-based interventions alone. Strengthening radiologic facilities in RHUs may require comprehensive strategies including acquisition of radiologic equipment, enhancement of healthcare infrastructure, implementation of preventive maintenance programs, recruitment and continuous training of qualified personnel, and stricter compliance with DOH standards and accreditation requirements. Addressing these concerns may help improve the overall quality, accessibility, safety, and effectiveness of radiologic services in rural healthcare settings and contribute to better healthcare outcomes within the community.

Summary

This study aimed to assess the status of Radiologic facilities and services in selected Rural Health Units in Maguindanao del Norte. The study was conducted at selected Rural Health Units in Maguindanao del Norte specifically, Upi, Datu Blah Sinsuat, and Datu Odin Sinsuat with 78 respondents who are currently working in the RHUs. Specifically, it examined the demographic profile of respondents, the status of radiologic facilities in terms of equipment, services, maintenance, human resources and compliance with DOH Standards, the problems encountered by RHUs, the suggested improvements and the relationship between demographic profile and assessment of radiologic facilities. Using a descriptive-correlational research design, data were gathered from Rural Health Unit Healthcare Personnel through a researcher-made questionnaire.

Major findings

Based on the findings of the study, the following Major Findings were drawn:

1. **Demographic Profile of the Respondents** The majority of the respondents belonged to the age group 40–49 years old, indicating that most respondents were middle-aged adults with considerable professional experience in healthcare services. In terms of sex, the respondents were predominantly female. Most respondents were married, employed under contractual status, and occupied the position of midwives in their respective Rural Health Units (RHUs). These findings suggest that the respondents were mainly experienced female

healthcare workers actively engaged in community healthcare delivery within RHUs in Maguindanao del Norte.

2. **Status of Selected Rural Health Units in Terms of Radiologic Facilities and Services.**

Presence of Radiologic Facilities The respondents generally disagreed that the selected RHUs possess adequate radiologic equipment and facilities. The findings revealed that many RHUs lack essential diagnostic imaging equipment such as X-ray and ultrasound machines. Respondents strongly acknowledged the evident absence of radiologic facilities within RHUs, indicating limited diagnostic capabilities in rural healthcare settings.

Availability of Radiologic Services The respondents generally disagreed that radiologic services are available and accessible within RHUs. The findings showed that patients are frequently referred to other healthcare institutions due to the lack of radiologic services. This indicates that RHUs are unable to consistently provide diagnostic imaging services needed by patients in rural communities.

Maintenance of Radiologic Equipment The respondents strongly disagreed that regular maintenance, inspection, and prompt repair systems are effectively implemented for radiologic equipment. The findings revealed weak maintenance practices and insufficient technical support, which may contribute to equipment malfunction and interruptions in healthcare services.

Availability of Human Resources The respondents strongly disagreed that RHUs have sufficient qualified and trained personnel for radiologic services. The findings revealed shortages of radiologic technologists, radiologists, and adequately trained healthcare staff capable of handling radiologic equipment and procedures.

Compliance with Department of Health (DOH) Standards and Accreditation The respondents strongly disagreed that RHUs adequately comply with DOH standards and accreditation requirements related to radiologic facilities and services. The findings revealed insufficient implementation of radiologic safety measures, lack of protective equipment, and inadequate compliance with licensing and accreditation standards.
3. **Problems Encountered by Selected Rural Health Units in Relation to Radiologic Facilities and Services** The study revealed several major problems encountered by RHUs in relation to radiologic facilities and services. These include the absence of essential radiologic equipment, unavailability of radiologic services, inadequate maintenance systems, shortage of trained and qualified personnel, insufficient funding and government support, and poor compliance with DOH standards and accreditation requirements. These challenges negatively affect the accessibility, quality, efficiency, and safety of healthcare services provided to rural communities.
4. **Suggestions Proposed by the Respondents to Improve the Presence and Availability of Radiologic Facilities** The respondents strongly recommended the acquisition of radiologic equipment and establishment of radiologic facilities within RHUs as the primary strategy

for improvement. They also emphasized the importance of increased government funding and support from agencies such as the LGU, MOH, and IPHO. Other recommendations include hiring and training qualified personnel, improving accessibility of radiologic services, implementing tele-radiology and outreach programs, strengthening referral systems and patient support mechanisms, establishing partnerships with private institutions, and promoting community awareness regarding radiologic services.

5. **Significant Relationship Between the Demographic Profile and Assessment of Radiologic Facilities** The findings revealed that only selected demographic variables showed significant relationships with specific dimensions of radiologic facility assessment. Specifically, sex showed a significant relationship with the presence of radiologic equipment; age showed a significant relationship with availability of human resources and compliance with DOH standards and accreditation; and employment status showed a significant relationship with compliance with DOH standards and accreditation. However, most demographic variables showed no significant relationship with the assessment of radiologic facilities. Thus, the null hypothesis stating that “there is no significant relationship between the demographic profile of respondents and the assessment of radiologic facilities in selected Rural Health Units in Maguindanao del Norte” was partially accepted and partially rejected. The null hypothesis was rejected in dimensions where significant relationships were identified and accepted in dimensions where no significant relationship was found.

Conclusion

The study concludes that the selected Rural Health Units in Maguindanao del Norte face significant challenges in providing effective and accessible radiologic services due to inadequate infrastructure, insufficient resources, shortage of trained personnel and weak compliance with healthcare standards. Therefore, comprehensive interventions and stronger collaboration among healthcare institutions, government agencies and stakeholders are necessary to improve radiologic facilities and enhance healthcare delivery in rural communities.

Therefore, based on the findings and conclusion of this study, the following recommendations are proposed to improve the presence, availability and effectiveness of radiologic facilities and services in selected Rural Health Units in Maguindanao del Norte.

Recommendations:

1. **Acquisition of Radiologic Equipment and Establishment of Facilities** - The Local Government Units (LGUs), Ministry of Health (MOH, Integrated Provincial Health Office (IPHO) and other concerned agencies may prioritize the procurement of essential radiologic equipment such as X-ray and Ultrasound Machines for Rural Health Units. Establishing functional radiologic facilities within RHUs may help improve diagnostic capabilities,

support early disease detection and reduce unnecessary referrals to distant healthcare institutions.

2. **Increase Government Funding and Resource Allocation** - Government agencies and healthcare administrators should allocate sufficient financial resources for the development and sustainability of radiologic services in Rural Health Units. Funding should cover the purchase of equipment, infrastructure improvement, maintenance programs and operational expenses.
3. **Strengthening Human Resource Development** - Rural Health Units should recruit qualified radiologic technologists and trained healthcare personnel to ensure the safe and efficient operation of radiologic services. Continuous professional development programs, seminars and trainings related to radiologic procedures, radiation safety and equipment handling should also be conducted regularly to improve the competency of healthcare workers.
4. **Implementation of Regular Maintenance and Inspection Programs** - Rural Health Units and healthcare administrators should establish regular maintenance schedules and inspection systems for radiologic equipment to ensure proper functionality, safety and reliability. Prompt repair mechanisms and technical support services should also be strengthened to minimize equipment downtime and interruptions in healthcare services.
5. **Enhancement of Compliance with DOH Standards and Accreditation** - Rural Health Units should strictly comply with Department of Health Standards and Accreditation requirements related to radiologic facilities and services. Safety measures such as the provision of lead aprons, warning signs and radiation protection devices should be prioritized to ensure patient and healthcare worker safety. Regular monitoring and compliance assessments should also be conducted by responsible agencies.
6. **Improvement of Accessibility to Radiologic Services** - Healthcare administrators should develop strategies to communities, particularly in geographically isolated areas. Establishing community-based radiologic facilities may help reduce transportation burdens, healthcare costs and delays in diagnosis and treatment among patients.
7. **Development of Partnerships and Innovative Healthcare Strategies** - Rural Health Units may explore partnerships with private healthcare institutions, non-government organizations and other stakeholders to support radiologic service development. Innovative approaches such as mobile radiologic services, outreach programs and tele-radiology systems may also be implemented to improve healthcare access in underserved communities while permanent facilities are still being established.
8. **Strengthening Referral Systems and Patient Support Mechanism** - Rural Health Units should establish formalized referral pathways and coordination systems with higher healthcare facilities to ensure continuity of care for patients requiring advanced diagnostic procedures. Transportation assistance and patient support programs may also be considered to reduce the burden on patients referred to distant facilities.
9. **Promotion of Community Awareness and Health Education** - Rural Health

Units should conduct health education and awareness campaigns regarding the importance and availability of radiologic services. Increasing public awareness may encourage healthcare utilization, promote early consultation and improve community participation in preventive healthcare practices.

10. Recommendations for Future Researchers - Future researchers may conduct similar studies involving a larger sample size and wider geographic coverage to further validate the findings of this study. Additional variables such as patient satisfaction, healthcare outcomes, financial capacity and organizational readiness may also be explored to provide a more comprehensive understanding of radiologic service delivery in rural healthcare settings.

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