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Knowledge of Medical and Nursing Students Regarding Breast Imaging

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Abstract. Background: Breast imaging plays an essential role in the diagnosis and management of breast disease. From screening asymptomatic patients to evaluating clinical abnormalities on diagnostic studies, breast imaging provides critical knowledge to the breast surgeon. Objectives: This study aimed to assess students' knowledge regarding breast imaging. Methodology: A cross-sectional descriptive study design was employed to evaluate the knowledge of medical and nursing students regarding breast imaging. The research was conducted at the University of Basrah. The study targeted female and male medical and nursing students in their first, second, third, and fourth years of study. A total of 150 students were invited to participate, aiming to achieve a representative sample of the student population. Results: The findings of this study indicate that the majority of the students, 77.3% have good knowledge about breast imaging. Conclusion: The present study concluded that the students have good knowledge about breast imaging.

Highlights:
1. Most students have good knowledge of breast imaging.
2. Breast imaging is important for early detection of breast cancer.
3. There are still gaps in knowledge that need to be addressed in the curriculum.

Keywords: Knowledge, Students, Breast Imaging, Medical, Nursing

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Introduction

Significant advancements in diagnostic imaging are still occurring as a result of social, political, and economic factors. The function of the diagnostic radiographer has expanded with a variety of career opportunities and the chance for role extension, advanced, and consultant practice due to rapidly changing technology and rising demand for radiography services in numerous patient paths [1]. More than ever before, radiography graduates must have a broad variety of abilities [2].

In order to satisfy a number of important documents, Higher Education Institutions (HEIs) must provide a curriculum that adequately prepares students for the tasks frequently associated with first-held posts [3-7]. Students also need to be exposed to specialized radiography areas to foster a fair and favorable view of all facets of the field and support well-informed career planning. Established practices are evolving in tandem with a changing workforce and workload. Before taking on more specialized responsibilities, radiographers no longer need to complete several years of "general" radiography, frequently with the chance to embrace a wider range of practice and skill set [8, 9]. In 2009, Ferris looked into specialization in diagnostic radiography and how radiologists perceive specialized practice areas like mammography. Potential prospects in specialized fields were perceived by those surveyed. There are established professional advancement opportunities in breast imaging [9].

There have long been reports of a scarcity in the mammography workforce. In 2001, it was addressed in conjunction with an increase in workload [8]. Nearly 54,000 women were diagnosed with breast cancer in 2013, more than 16 years into the UK's breast screening program, and the incidence is still rising [10]. If the present pilot age extension is carried out, 10 million more women will be screened, up from the current 8 million [11].

Additionally, the number of referrals for benign breast disease and the "worried well" has increased in the symptomatic service. The workforce is experiencing a problem at all four levels, in addition to the ongoing rise in demand. According to a recent national poll on the radiography workforce, 65% of participants said that mammographer positions were not being filled [12]. Furthermore, 50% of breast imaging consultant radiologists are expected to retire in the next ten years, and nearly 25% will do so in the next five. Similarly, 38% of breast radiologists are expected to retire in the next ten years, and 21% are expected to retire in the next five years [13]. The continuous provision of breast imaging services depends on radiographers being hired into this specialty, employees being retained, and upskilling into more advanced positions [14].

Materials and methods:

A cross-sectional descriptive study design was adopted to evaluate the knowledge of medical and nursing students concerning breast imaging. The research was conducted at the University of Basrah, a prominent institution offering comprehensive medical and nursing programs. The university is equipped with modern facilities that support healthcare education. The study targeted female and male medical and nursing students in their third and fourth years of study. A total of 150 students were invited to participate, aiming to achieve a representative sample of the student population.

The questionnaire underwent a pilot test with a subset of students to ensure clarity and

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reliability, and necessary adjustments were made based on the feedback received. Knowledge level was assessed through multiple questions regarding breast cancer and imaging modalities.

The researchers used three (3) three-point Likert Scale, ranging from 1 to 3. This scale is composed of (31) items; these items were measured on a three-point Likert scale, which ranged from 1 (No), 2 (Don't know), and 3 (Yes). About (10–15) Minutes were given to each nurse for test completion. The level of assessment for each item in the knowledge scales was estimated by calculating the cut-off point for the mean of the score and scored as follows: The researcher determined (1–1.66) for poor knowledge, (1.67–2.32) for moderate knowledge, and (2.33–3) for good knowledge.

Results

Thyroid hormones concentration

(1): Distribution of the Variables Related to Demographic Characteristics N=150 Medical and Nursing Students

Table 4.1.1 Descriptive Statistics of Demographic Characteristics

Demographic Variables	Variables Classes	F	Percent
Age Years	19 to less than 24	111	74.0
	24 to less than 29	25	16.7
	29 to 33	14	9.3
	Total	150	100.0
Sex	Male	78	52.0
	Female	72	48.0
	Total	150	100.0
Marital Status	Married	25	16.7
	Single	125	83.3
	Total	150	100.0
College	Diploma	50	33.3
	College of Nursing	50	33.3
	College of Medicine	50	33.3
	Total	150	100.0
Year	First	30	20.0
	Second	39	26.0
	Third	37	24.7
	Fourth	44	29.3
	Total	150	100.0

F = frequency

This table shows the socio-demographic characteristics of the students in the present study. The age group was 19 to less than 24 years (74%), more than half were male (52%), and most of the students were single (99.7%). Regarding the college, every college has an equal percentage (33.3%). Most of the students are from the fourth stage (29.3%).

Table (2): Students' Knowledge Regarding General Informations about the Breast

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Students' Knowledge Regarding General Knowledge about the Breast						
Items	Answer	N = 150		Mean Score	Sd	Ass.
		F	%			
1. The breast is an apocrine gland	No	19	12.7	2.68	0.689	Good
	Don't Know	10	6.7			
	Yes	121	80.7			
	Total	150	100.0			
2. It is predominantly composed of adipose and glandular tissues	No	3	2.0	2.79	0.453	Good
	Don't Know	25	16.7			
	Yes	122	81.3			
	Total	150	100.0			
3. The glandular tissue is estrogen-dependent	No	17	11.3	2.53	0.692	Good
	Don't Know	37	24.7			
	Yes	96	64.0			
	Total	150	100.0			
4. It extends from the 2nd to the 6th ribs	No	22	14.7	2.45	0.738	Good
	Don't Know	39	26.0			
	Yes	89	59.3			
	Total	150	100.0			
5. It extends into the axilla, called the axillary tail	No	8	5.3	2.52	0.599	Good
	Don't Know	56	37.3			
	Yes	86	57.3			
	Total	150	100.0			
6. It has an extensive lymphatic drainage system	No	10	6.7	2.59	0.614	Good
	Don't Know	41	27.3			
	Yes	99	66.0			
	Total	150	100.0			
7. Mastitis is common in reproductive-age women	No	22	14.7	2.46	0.738	Good
	Don't Know	37	24.7			
	Yes	91	60.7			
	Total	150	100.0			
8. Gynecomastia is common in males	No	52	34.7	2.11	0.891	Moderate
	Don't Know	30	20.0			
	Yes	68	45.3			
	Total	150	100.0			
9. Benign masses are common in females	No	15	10.0	2.61	0.663	Good
	Don't Know	28	18.7			
	Yes	107	71.3			
	Total	150	100.0			
10. Malignant masses are more common in males	No	73	48.7	1.73	0.800	Moderate
	Don't Know	44	29.3			
	Yes	33	22.0			

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	Total	**150**	**100.0**			

N= Number, % = Percent, Ass. = Assessment, Sd=Standard Deviation

According to this table, most of the students know the breast is an apocrine gland (80.7%), most of the students see the breast as composed of adipose and glandular tissues (81.3%), most of the students know the glandular tissue is estrogen-dependent (64%), most of the students see the breast extends from 2nd to 6th ribs (59.3%), most of the students know the breast extends into the axilla called axillary tail (57.3%), most of the students know the breast has an extensive lymphatic drainage system (66%), most of the students know mastitis is common in reproductive-age women (60.7%), most of the students know Gynecomastia is common in males (45.3%), most of the students know Benign masses are common in females (71%), and most of the students no consider Malignant masses more common in males (48.7%).

Table (3): Students' Knowledge Regarding Breast Imaging

Students' Knowledge Regarding Imaging						
Items	**Answer**	**N = 150**		**Mean Score**	**Sd**	**Ass.**
		F	**%**			
1. Imaging helps to differentiate benign from malignant masses	**No**	**12**	**8.0**	**2.74**	**0.596**	**Good**
	Don't Know	**15**	**10.0**			
	Yes	**123**	**82.0**			
	Total	**150**	**100.0**			
2. Imaging helps to diagnose malignant lesions early	**No**	**9**	**6.0**	**2.78**	**0.542**	**Good**
	Don't Know	**15**	**10.0**			
	Yes	**126**	**84.0**			
	Total	**150**	**100.0**			
3. The following modalities are beneficial in breast imaging A- Mammography	**No**	**10**	**6.7**	**2.59**	**0.614**	**Good**
	Don't Know	**41**	**27.3**			
	Yes	**99**	**66.0**			
	Total	**150**	**100.0**			
3. The following modalities are beneficial in breast imaging B- Ultrasonography	**No**	**10**	**6.7**	**2.57**	**0.617**	**Good**
	Don’t Know	**44**	**29.3**			
	Yes	**96**	**64.0**			
	Total	**150**	**100.0**			
3. The following modalities are beneficial in breast imaging C- CT	**No**	**14**	**9.3**	**2.56**	**0.660**	**Good**
	Don’t Know	**38**	**25.3**			
	Yes	**98**	**65.3**			
	Total	**150**	**100.0**			
3. The following modalities are beneficial in breast imaging D- MRI	**No**	**18**	**12.0**	**2.52**	**0.702**	**Good**
	Don’t Know	**36**	**24.0**			
	Yes	**96**	**64.0**			
	Total	**150**	**100.0**			
4. Mammography is a specialized high-dose X-ray machine	**No**	**15**	**10.0**	**2.40**	**0.666**	**Good**
	Don’t Know	**60**	**40.0**			
	Yes	**75**	**50.0**			
	Total	**150**	**100.0**			

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5. Mammography is basically of two types: screening and diagnostic	No	14	9.3	2.55	0.661	Good
	Don't Know	39	26.0			
	Yes	97	64.7			
	Total	150	100.0			
6. The principal task of mammography is the early detection of breast carcinoma	No	12	8.0	2.59	0.637	Good
	Don't Know	38	25.3			
	Yes	100	66.7			
	Total	150	100.0			
7. Screening mammography performed on asymptomatic women	No	31	20.7	2.35	0.804	Good
	Don't Know	35	23.3			
	Yes	84	56.0			
	Total	150	100.0			
8. Diagnostic mammography performed on symptomatic women	No	21	14.0	2.50	0.730	Good
	Don't Know	33	22.0			
	Yes	96	64.0			
	Total	150	100.0			
9. Screening is performed at age	No	16	10.7	2.41	0.677	Good
	Don't Know	57	38.0			
	Yes	77	51.3			
	Total	150	100.0			
10. Utilizes X-ray	No	21	14.0	2.37	0.718	Good
	Don't Know	53	35.3			
	Yes	76	50.7			
	Total	150	100.0			
11. Operator dependent	No	13	8.7	2.37	0.639	Good
	Don't Know	69	46.0			
	Yes	68	45.3			
	Total	150	100.0			
12. Cheap and available	No	31	20.7	2.33	0.800	Moderate
	Don't Know	38	25.3			
	Yes	81	54.0			
	Total	150	100.0			
13. Can differentiate a cyst from a solid mass	No	17	11.3	2.53	0.692	Good
	Don't Know	36	24.0			
	Yes	97	64.7			
	Total	150	100.0			
Magnetic Resonance Imaging (MRI)						
14. Orientation and margin of the mass are important to look for	No	4	2.7	2.78	0.476	Good
	Don't Know	25	16.7			
	Yes	121	80.7			
	Total	150	100.0			
15. Utilizes X-ray	No	26	17.3	2.33	0.755	Moderate
	Don't Know	49	32.7			
	Yes	75	50.0			
	Total	150	100.0			
16. Always examine both breasts	No	10	6.7	2.69	0.592	Good

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	Don't Know	27	18.0			
	Yes	113	75.3			
	Total	150	100.0			
17. expensive	No	27	18.0	2.38	0.774	Good
	Don't Know	39	26.0			
	Yes	84	56.0			
	Total	150	100.0			
18. Indicated in multiple masses	No	9	6.0	2.53	0.610	Good
	Don't Know	53	35.3			
	Yes	88	58.7			
	Total	150	100.0			
19. Not indicated in a postoperative patient	No	23	15.3	2.27	0.711	Moderate
	Don't Know	64	42.7			
	Yes	63	42.0			
	Total	150	100.0			
20. Contrast media not used	No	25	16.7	2.19	0.699	Moderate
	Don't Know	72	48.0			
	Yes	53	35.3			
	Total	150	100.0			
21. Difficult to interpret	No	33	22.0	2.20	0.777	Moderate
	Don't Know	54	36.0			
	Yes	63	42.0			
	Total	150	100.0			

N=Number, % = Percent, Ass. = Assessment, Sd=Standard Deviation

According to this table, most of the students know that Imaging helps to differentiate benign from malignant masses (82%), most of the students know Imaging helps to diagnose malignant lesions early (84%), most of the students know the following modalities are beneficial in breast imaging; mammography (66%), Ultrasonography (64%), CT (65.3%), and MRI (64%), half of the student know Mammography is a specialized high-dose X-ray machine (50%), most of the students know Mammography basically of two types: screening and diagnostic (64.7%), most of the students know the principal task of mammography is early detection of breast carcinoma (66.7%), more than half of the participants know Screening mammography performed on asymptomatic women (56%), most of the students know Diagnostic mammography performed on symptomatic women (64%), more than half of the students know Screening is performed at age (51.3%), more than half of the students know imaging is Utilizes X-ray (50.7%), most of the students don't know imaging is Operator dependent (46%), more than half of the students know imaging is Cheap and available (54%), and more than half of the students know imaging Can differentiate a cyst from a solid mass (54.7%).

Regarding Magnetic Resonance Imaging (MRI), most of the students know MRI Orientation and margin of the mass are important to be looked for (80.7%), half of the students know MRI Utilizes X-ray (50%), most of the students know MRI Always examine both breasts (75.3%), more than half of the students know MRI is expensive (56%), more than half of the students know MRI is Indicated in multiple masses (58.7%), most of the students don't know MRI Not indicated in a postoperative patient (42.7%), most of the students don't know Contrast media not used in MRI (48%). Most of the students know MRI is Difficult to interpret (42%).

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Discussion

The results indicate that most students have good knowledge of breast imaging, while the remaining percentage have moderate knowledge, and no students showed poor knowledge. The data revealed that the majority of students are aware that the breast is an apocrine gland (80.7%) and that it consists of fatty and glandular tissues (81.3%). The results also show that students recognize the importance of mammography, with 66.7% confirming that its primary goal is early detection of breast cancer.

However, some knowledge gaps were noted, such as 48.7% of students not realizing that malignant tumors are more common among females than males, indicating the need for improved education on breast cancer risk factors.

These results confirm previous studies showing that healthcare students have good knowledge of breast imaging, but there are gaps in their deep understanding of certain aspects, such as breast cancer-related risk factors and the radiological considerations of mammograms. These gaps indicate the need to improve curricula to better integrate theoretical and practical aspects.

Conclusion

The results showed that most students possess a good level of knowledge about breast imaging and recognize its importance in early detection of breast disease. There is a need for future studies about breast imaging in a large sample size and multi-center studies.

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