

The Scope of Practices and Challenges of Sonographers as a Recognized Allied Health Professional in Malaysia

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ABSTRACT

Background: Sonography profession in Malaysia is as a crucial component of allied health services. This study aimed to assess the current scope of practices and challenges of sonographers as recognized allied health professional in Malaysia and determined the association between the scope practices and the challenges encountered. **Methods:** A cross-sectional study was conducted among sonographers in Malaysia registered under Malaysian Sonographers Association (MASA) indicated that they are bounded to a professional organization. A total of 131 respondents were surveyed following the inclusion and exclusion criteria. An online questionnaire was distributed, comprising three sections: demographic, scope of practices and challenges of sonographers in Malaysia. Data was analyzed using the Statistical Packages for Social Sciences (SPSS), utilizing the descriptive analysis and Spearman Correlation test. **Results:** The scope of practices of sonographer yielded almost 99.2% respondents that agreed to the statement of sonographers in Malaysia should possess a thorough understanding and adhere to their workplace's standard operating procedures (SOP). The most encountered challenges of sonographers (93.1%) are obtaining a graduate certificate, graduate diploma, master's degree, or doctoral degree in sonography is necessary for employment in Malaysia. Spearman correlation test yielded p-value <0.01, correlation coefficient, (r) was 0.37, indicating a statistically significant moderate positive correlation between the scope of practices and challenges encountered by sonographers in Malaysia. **Conclusion:** As a conclusion, the scope of practices of sonographers in Malaysia has expanded, strengthening the need for enhanced recognition, education and support for their profession. Significant correlation was found suggested that as the scope of practices increase, the challenges of sonographers encountered also tend to increase. Future recommendations include establishing comprehensive training programs, improving workplace ergonomics, and conducting further longitudinal research.

Keywords:

sonography; sonography profession; sonographer; perspectives; practice; challenges

INTRODUCTION

Conventional diagnostic ultrasonography, often referred to ultrasound that is commonly utilized in various medical specialties, including obstetrics and gynaecology, cardiology, urology, and musculoskeletal imaging. The global demand for ultrasound services is on the rise due to the acknowledged benefits and continuous technological advancements in ultrasound. This demand indicated the crucial role of sonographers in healthcare system, primarily because ultrasound technology is an operator dependent (Reeve et al.,2022).

The primary duty of sonographers in the beginning was to utilize physics and instrumentation to generate images while the task of interpreting and extracting information from these images remained the responsibility of physicians (Pessin, 2023). Nevertheless, sonographers nowadays need to be well-equipped with knowledge, training and expertise on the anatomy, physiology,

pathology, and sonographic physics particularly for specialized procedure. Sonographers' expertise extends beyond technical proficiency with; it also includes a comprehensive understanding of numerous knowledge in delivering a high-quality patient care.

In Malaysia, the practices and responsibilities of sonographers has expanded to a wider range within healthcare system. The core responsibility of sonographers also plays a pivotal role in patient care, working closely with multidisciplinary teams including radiologists, physicians, and other healthcare providers to ensure accurate and timely diagnosis. According to the Medical Radiation Surveillance Division Ministry of Health Malaysia (2022), there are four major scopes of ultrasound currently practised by sonographers which are Obstetrics and Gynaecology, Radiology, Point-of-Care Ultrasound (PoCUS) and Echocardiography. Notwithstanding, sonographers stand to gain significant advantages from that international scope of practice, notably through

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standardized educational requirements and enhanced professional flexibility (Miles et al., 2022). Despite the significant contributions of sonographers in healthcare system, whether in Malaysia or globally, they experienced variety of challenges in light of their professional practices.

Therefore, this research is aimed to investigate the scope of practices of sonographers in Malaysia and challenges faced by sonographers as a recognized allied health profession in Malaysia. Hence, assessing the relationship between the scope of practices and challenges encountered by sonographers in Malaysia.

MATERIALS AND METHODS

Ethical approval

This cross-sectional study is aimed to assess the current scope of practices and challenges of sonographers as a recognized allied health professionals in Malaysia. The study obtained ethical approval IUM Research Ethical Committee (IREC) IUM/504/14/11/2/IREC 2024-KAHS/DDIR.

Study Population

The study focused on sonographers registered with Malaysian Sonographers Association (MASA) as the research participants indicated that they are bounded to the professional organization, in order to be a recognized allied health profession. The inclusion criteria were sonographers practiced in Malaysia and are active sonographers while the exclusion criteria are sonographers practiced outside Malaysia and are inactive or retired sonographers. All participants were consented, fully informed about the study and voluntarily agreed to participate.

Sample Size Calculation

The sample size was determined by using the Slovin's formula. The sample size was calculated at a 95% confidence interval (CI) where the z value is 1.96. The margin of error is 5% and the population size is 168 which are the amount of MASA registered member. Thus, the sample size for this study is about 118 participants. However, final sample size is 131 participants.

Questionnaires and Data Collection

A questionnaire was designed to evaluate the diverse viewpoints and perspectives of sonographers in Malaysia regarding their scope of practice and the challenges they encountered. The Likert-scale questionnaires consist of range of responses from "Strongly Disagree" to "Strongly

Agree."

The validated questionnaire undergone a reliability test for the internal consistency of the questionnaires. The results of Cronbach's Alpha for the scope of practices was 0.86 whilst the challenges encountered by sonographers was 0.74, indicating a relatively high reliability.

Demographic Questionnaire

The first part of the questionnaire was demographic characteristics. This part involved the collection of information pertaining to age, gender, years of experience and employment setting.

Scope of Practices and Challenges of Sonographers Questionnaire

The next parts of the questionnaire were the sonographers' scope of practices and challenges. The constructed questionnaire used adapt and adopt method from several resources including previous research (Pessin, 2023, Hardicre et al., 2021. Hagen-Ansert & Baker 2007). Fifteen items were developed to examine the scope of practices for sonographers in Malaysia were shown in Table 1 while 7 items were developed to investigate the challenges of sonographers in Malaysia were shown in Table 2.

Table 1: Scope of practices for sonographers in Malaysia

No.	Item
1.	Sonographers should possess a thorough understanding and adhere to their workplace's standard operating procedures (SOP).
2.	Sonographers play a role in verifying patient identification and ensuring that the requested examination matches the patient's clinical history and symptoms.
3.	Sonographers play a role in assessing limitations and preparing the patient before the examination. (e.g.: thick abdomen, non-cooperative paediatrics patients)
4.	Sonographers should effectively communicate with different aspects of patients (e.g.: age, gender, educational background, and physical ability).
5.	Sonographers play a role in directing medical questions about diagnosis to the physicians or specialists.
6.	Sonographers play a role in integrating medical history and clinical symptoms to decide on appropriate diagnostic methods to fulfil the patient's needs.
7.	Sonographers play a role in identifying normal and abnormal features in ultrasound images to decide the necessary adjustments to the scanning techniques.

8.	Sonographers play a role in primary analysis of the sonographic findings to ensure that the physician or specialist has sufficient data to interpret the results.
9.	Sonographers play a role in providing the utmost patient care during the ultrasound procedure.
10.	Sonographers are expected to be able to perform all types of ultrasound imaging including Abdominal, Obstetrics and gynaecology, Echocardiography, Vascular sonography, Musculoskeletal sonography and small parts sonography
11.	Sonographers play a role in generating formal reports of ultrasound findings.
12.	Sonographers play a role to ensure the equipment is well-functioning and take immediate action in the case of equipment malfunctions.
13.	Sonographers play a role in utilizing problem-solving skills to make decisions during ultrasound procedures.
14.	Sonographers are involved in research activities to enhance their career's ethical and professionalism.
15.	Sonographers are involved in continuous medical education (CME) to update the current knowledge and enhance competency in their career.

Table 2: Challenges of sonographers in Malaysia

No.	Item
1.	Sonographers' job opportunities are limited.
2.	Sonographers' jobs are underpaid.
3.	Sonographers might encounter difficulty in handling patients' emotional situations when delivering bad news to patients.
4.	Sonographers are prone to have work-related musculoskeletal diseases (WRMSD).
5.	Sonographers are not provided with ergonomic workstations to meet individual postural needs.
6.	Sonographers are required to have a graduate certificate/graduate diploma/masters in sonography/doctoral degree in sonography to be employed in Malaysia.
7.	Sonographers often work extended hours beyond office hours due to: <ul style="list-style-type: none"> i) producing paperwork. ii) increased number of patients. iii) attending to the urgent cases. iv) research activities. v) Continuous medical education (CME) or professional bodies activities. vi) other reasons.

Data Analysis

The data collected were analyzed using the Statistical Packages for Social Sciences (SPSS) version 20 (IBM Corporation, New York, USA). The demographic characteristics, scope of practices and challenges encountered by sonographers were analyzed using

descriptive analysis. Normality test was performed to check for the data distribution. The Spearman's test was used to assess the association between the scope of practices and challenges encountered by sonographers in Malaysia as the data obtained was not normally distributed.

RESULTS

Demographic Characteristics

Table 3 outlines the demographic characteristics of the respondents, comprising 131 respondents, 19 (14.5%) were from male respondents and 112 (85.5%) female respondents. Nearly half of the respondents (48.9%) fell within the age of 20 to 30 years. In terms of professional experience, 45.8% of respondents reported a tenure ranging from one to five years, while a smaller fraction (17.6%) had less than a year of work experience. A significant portion (96.9%) of respondents indicated employment within a private setting.

Table 3: Demographic Characteristics of the Respondents

Item	Characteristics	Frequency (n)	Percentage (%)
Gender	Male	19	14.5
	Female	112	85.5
Age	20 to 30 years	64	48.9
	31 to 40 years	58	44.3
	41 to 50 years	7	5.3
	51 to 60 years	1	0.8
	61 years and above	1	0.8
Years of experience	Less than 1 year	23	17.6
	1 to 5 years	60	45.8
	5 to 10 years	24	18.3
	10 years and above	24	18.3
Employment setting	Government	4	3.1
	Private	127	96.9

Throughout the study, the findings showed that sonographers responding to this survey were more likely to be female, similar with the current study by Pessin (2023). These findings suggest a demographic trend within the sonography profession that warrants further investigation. Moreover, the average age and years of experience of sonographers responding to this survey was lower than the previous study, which they reported an average age as 55-64 years with 23 years of sonography experience on average. As compared to this recent study, most responses came from the 20-30 age group, and they had 1-5 years of sonography experience, on average. This

disparity can be attributed to the varying demographics of participants.

Scope of Practices of Sonographers in Malaysia

Table 4 shows almost all items addressing the scope of practices of sonographers had the agreement that reached almost 90% and above except for the item number 5, 6, 10, 11 and 14 yielded 83.2%, 77.9%, 38.9%, 71.8% and 79.4%, respectively. Most respondents approximately 99.2% agreed to item number 1 in which sonographers in Malaysia should possess a thorough understanding of and adhere to their workplace's standard operating procedures (SOP). Interestingly, the statement to the item number 10 stated that sonographers are expected to be able to perform all types of ultrasound imaging, such as abdominal sonography, obstetric and gynaecological sonography, echocardiography, vascular sonography, musculoskeletal sonography, and small parts sonography received mixed responses composed of (38.9%) agreed (32.8%) neutral, and (28.2%) disagreed. This disparity indicated a greater diversity of job scope among sonographers in Malaysia at different scanning centres or health facilities.

Table 4: Scope of practices of sonographers in Malaysia

Item No.	Agreement, n (%)	Neutral n (%)	Disagreement n (%)	Mean (SD)
1.	130 (99.2%)	1 (0.8%)	0 (0%)	4.8 (0.4)
2.	127 (96.9%)	4 (3.1%)	0 (0%)	4.8 (0.5)
3.	122 (93.1%)	6 (4.6%)	3 (2.3%)	4.6 (0.7)
4.	123 (93.9%)	8 (6.1%)	0 (0%)	4.6 (0.6)
5.	109 (83.2%)	16 (12.2%)	6 (4.6%)	4.3 (0.9)
6.	102 (77.9%)	20 (15.3%)	9 (6.9%)	4.2 (1.0)
7.	129 (98.5%)	2 (1.5%)	0 (0%)	4.8 (0.4)
8.	126 (96.2%)	4 (3.1%)	1 (0.8%)	4.7 (0.6)
9.	125 (95.4%)	6 (4.6%)	0 (0%)	4.7 (0.5)
10.	51 (38.9%)	43 (32.8%)	37 (28.2%)	3.2 (1.1)
11.	94 (71.8%)	26 (19.8%)	11 (8.4%)	3.9 (1.0)
12.	126 (96.2%)	5 (3.8%)	0 (0%)	4.6 (0.6)
13.	118 (90.1%)	13 (9.9%)	0 (0%)	4.5 (0.7)
14.	104 (79.4%)	23 (17.6%)	4 (3.1%)	4.2 (0.9)
15.	122 (93.1%)	6 (4.6%)	3 (2.3%)	4.6 (0.7)

This finding supported by the existing study in the United States (US) and United Arab Emirates (UAE), highlighting variety of roles performed by sonographers involving teamwork with physicians and radiologists to conduct scans, capture images, and report findings must follow the professional standards and ethical guidelines (Abuzaid and Elshami, 2024). By following SOP, sonographers comply with the expectations set by professional bodies and ensure that examinations performed meet the

professional benchmarks for competence and performance. According to Bierig

(2022), the influencing factors are due to the rapid advancements in diagnostic technology and growing demands for imaging services of ultrasound. Hence, sonographers should possess a thorough understanding and adhere to their workplace's SOP, thereby fostering high-quality practice and maintaining professional integrity within the scope of sonographers' practices.

This current study suggested a variation in the trend where sonographers are expected to be proficient across all types of ultrasound imaging specialties, such as abdominal, echocardiography, vascular, musculoskeletal, small parts, obstetrics & gynaecology sonography, are probably due to the different demands of scanning centres or health facilities, portraying variety of cases being referred to the scanning centres or health facilities in Malaysia. This finding supported by the existing study where most sonographers are actively working in the fields of abdominal, obstetric, gynaecological, vascular, and small parts sonography (Pessin, 2023). This specialization suggests a focus on expertise within areas of sonography practice rather than a broad spectrum of skills across all specialties throughout the country.

Challenges of Sonographers in Malaysia

Table 5 illustrates the challenges encountered by sonographers in their professional practice. Most respondents approximately 93.1% agreed to the statement of the item number 6, that obtaining a graduate certificate, graduate diploma, master's degree, or doctoral degree in sonography is necessary for employment in Malaysia are the ultimate challenges being a sonographer as a recognized allied health profession in Malaysia. Furthermore, majority of sonographers about 89.3% agreed that they are prone to have WRMSD. Contrary to only around 17.6% respondents agreed that they worked extended hours beyond office hours due to research activities, sonographers are more often working extended hours due to the increased number of patients (74.8%).

Table 5: Challenges of Sonographers in Malaysia

Item No.	Agreement n (%)	Neutral N (%)	Disagreement n (%)	Mean (SD)
1.	77 (58.8%)	32 (24.4%)	22 (16.8%)	3.6 (1.2)
2.	80 (61.1%)	42 (32.1%)	9 (6.9%)	3.9 (1.0)
3.	98 (74.8%)	26 (19.8%)	7 (5.3%)	4.0 (0.9)
4.	117 (89.3%)	11 (8.4%)	3 (2.3%)	4.5 (0.8)
5.	101 (77.1%)	18 (13.7%)	12 (9.2%)	4.1 (1.0)
6.	122 (93.1%)	7 (5.3%)	2 (1.5%)	4.6 (0.7)
7.	71 (54.2%)	35 (26.7%)	25 (19.1%)	4.0 (1.2)

i)	38 (29.0%)	43 (32.8%)	50 (38.2%)	2.9 (1.3)
ii)	98 (74.8%)	24 (18.3%)	9 (6.9%)	4.1 (1.0)
iii)	78 (59.5%)	37 (28.2%)	16 (12.2%)	3.7 (1.1)
iv)	23 (17.6%)	46 (35.1%)	62 (47.3%)	2.6 (1.1)
v)	36 (27.5%)	52 (39.7%)	43 (32.8%)	2.9 (1.2)
vi)	34 (26.0%)	49 (37.4%)	48 (36.6%)	2.7 (1.3)

Association between the scope of practices and challenges encountered by sonographers in Malaysia

Table 6 shows the association between the scope of practices and challenges encountered by sonographers in Malaysia. The p-value was set at <0.05, indicated there was association between variables. Correlation coefficient, r value was set at 0.00-0.25 (weak), 0.25-0.50 (moderate), 0.50-0.75 (strong) and 0.75-1.00 (very strong). The obtained p-value was less than 0.01, and correlation coefficient, r value was 0.37 hence, there was statistically significant moderate positive correlation between the scope of practices and challenges encountered by sonographers in Malaysia. This result suggested as the scope of practices increase, the challenges of sonographers encountered also tend to increase.

Table 6: Association between the scope of practices and challenges encountered by sonographers in Malaysia

Scope of Practices of Sonographers		
Challenges of Sonographers	Correlation coefficient (r)	0.37
	p-value	<0.01

Throughout this study, the findings show that sonographers in Malaysia encountered several challenges in their professional practices. The most challenging part of being a sonographer in Malaysia is due to the requirement to have a graduate certificate, graduate diploma, masters in sonography or doctoral degree in sonography to be employed in Malaysia. This finding supported the study by Abuzaid and Elshami (2024), where only certified sonographers are permitted to practise sonography. Furthermore, continuous professional development is essential for keeping up to date with the latest advancements in the field (Abuzaid, 2024). Without certifications, it may potentially impact the quality of care to the patient.

This stringent educational requirement is likely influenced by the country's emphasis on academic qualifications and skills for employment. This statement is supported by a previous study, highlighting that sonographer education ranges from strict formal qualifications in some countries to informal on-the-job training and short courses in many others (Miles et al., 2022). This requirement presents

several obstacles including lack of educational and training accessibility, financial constraint and significant time needed for focused training (McCormick et al., 2023). As a result, the scarcity of sonographers worsens, leading to less professional recognition and encouragement to pursue career (Elshami et al., 2022).

Furthermore, the finding revealed that having WRMSD is challenging among sonographers in Malaysia, aligned with the study in the UK by Bolton and Cox (2015). Zhang & Huang (2017) stated that sonographers who scan for longer hours per day and attend to more patients tend to report higher levels of musculoskeletal pain and discomfort in specific body areas. A study by Pallotta and Roberts (2016) emphasized that one out of every five sonographers globally WRMSD for over half of their careers eventually terminates their career. Similar to Harrison and Harris (2015) reported that WRMSD can result in long-term disability or career-ending injuries among sonographers. Compounding to this issue is probably due to the inadequacy of ergonomic equipment tailored for sonographers in many Malaysian healthcare facilities. Lack of adjustable tables and poor-quality chairs can force sonographers into uncomfortable positions, increasing their risk of musculoskeletal injuries.

Moreover, findings highlighted that sonographers often work extended hours beyond regular office hours which is partly due to the nature of their clinical responsibilities as such increased number of patients rather than engaging in research activities. Unlike professions that might have defined office hours, the schedule for sonographers can vary widely depending on patient demand, hospital or clinic operating hours, and emergency cases requiring immediate attention. This variability often leads to extended shifts to ensure continuous patient care.

It aligns with studies conducted in the US, UK, and UAE, which indicate that the extended work hours are predominantly driven by clinical obligations rather than research engagement. For instance, Elliott et al. (2009) found fewer sonographers actively participating in research activities, highlighting that their workload is primarily focused on clinical duties. Therefore, the extended work hours for sonographers in Malaysia is challenging primarily due to the clinical obligations to meet patient needs rather than engaging in research activities.

CONCLUSION

As conclusion, the scope of practices of sonographers in Malaysia have expanded, strengthening the need for enhanced recognition and support for their profession. Notably, a significant correlation was found between the

scope of practice and the challenges faced by sonographers, suggesting that increasing the scope of practices of sonographers is associated with increased professional challenges and difficulties. Hence, addressing these challenges could possibly elevate sonographers towards continued delivery of high-quality service. This study highlights the need for enhanced training and regulatory support to ensure sonographers can effectively fulfil their roles. The study limitation is the possibility of influence by several external factors such as changes in healthcare policies and technological advancements might evolve the scope of practices of sonographers over time. Therefore longitudinal studies are suggested to provide a more comprehensive and nuanced understanding of the factors influencing their work environment. Future recommendations include establishing comprehensive training programs, improving workplace ergonomics, and conducting further research to develop strategies that can alleviate the challenges faced by sonographers in Malaysia in the era of expanding their scope of practices as the technology advances.

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