

## Unravelling the Professional Experiences of Cardiac Sonographers

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### Abstract

This study explores the professional experiences of cardiac sonographers in Region IX and Jolo, Sulu, Philippines, including their challenges, coping mechanisms, and professional growth. A descriptive-qualitative design was employed in this study through in-depth interview and focus group discussions in 15 cardiac sonographers. Thematic analysis showed three major themes: The Complexity of work, Embracing Challenges, and Valuing Professionalism. Despite the high-pressure nature of their work, participants found fulfillment through teamwork, mindfulness, and continuous learning. Therefore, the findings emphasized the necessity for improved institutional support, standardized training, and policy improvements to enhance the practice of cardiac sonography. Lastly, this study contributes important understandings into improving workplace conditions and career sustainability for cardiac sonographers.

**Keywords:** *Social Science, Cardiac Sonography, Radiology, Descriptive-Qualitative, Jolo, Sulu Philippines*

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### Introduction

Cardiac sonography is indispensable in healthcare, particularly in cardiology, where it assists in diagnosing heart diseases and by managing coronary artery narrowing, valve function, and structural abnormalities (Zheng, 2024). Yet, due to staff shortages, practitioners from other allied health fields with diverse educational backgrounds perform this procedure leading to inconsistent skill levels, potentially impacting the accuracy of diagnoses and patient outcome (Hagen-Ansert & Billick, 2023). The total graduates of cardiac sonographers have only increased 23.0%

resulting to insufficiency of workforce, causing to 36.3% increase of sonographer job vacancy (Won et al., 2024). Educational disparities are seen among these professionals as there is a distinction between the required skills and those needed by other healthcare professionals (Stoodley & Mason, 2024). In the United States, the shortages of cardiac sonographers have led to a significant gap between the demand for ultrasound exams and the available workforce. This has resulted in other healthcare practitioners stepping in to perform these procedures (Won et al., 2024). Meanwhile in the UK, the shortage of cardiac sonographers is predicted to worsen, with current training capacities

unable to meet future demands. This has prompted the exploration of extended working hours and simulation-based training to increase capacity (Harrison & Beardmore, 2020). Also, In Australia, the need for updated educational standards to meet industry expectations highlights the global nature of this shortage (Perry et al., 2024). In 2021, there were 2,487 cardiac sonographers on record, with 405 responding to the survey. Nearly half of these sonographers (48.3%) were based in the National Capital Region. Among the respondents, the highest number where nurses consist of 46.7%, while medical technologists are only 21.8% and lowest are radiologic technologists with only 18.9% (Magno et al., 2023). In addition, many echocardiographic facilities in the country face challenges related to outdated and insufficient equipment, which further impedes accurate diagnostics and reflects

## Methods

### Research Design

The researchers adopted a Descriptive-Qualitative approach to document the professional experiences of cardiac sonographers. This qualitative design provided the opportunity to deeply focus on the participants' views, highlighting the interpretation of their experiences. In a descriptive-qualitative design, the focus is on obtaining detailed, contextualized accounts of participants' experiences. A sample size of 15 cardiac sonographers was deemed appropriate to ensure a rich and diverse collection of narratives while remaining manageable for in-depth analysis. This number is sufficient to reach data saturation, where recurring patterns and themes emerge,

broader resource disparities (Chandra & Jana, 2019).

There are several of literature that touches on these issues, but they are often conducted in quantitative research, missing the nuanced realities of the profession (Hagen-Ansert & Billick, 2023). Furthermore, in underdeveloped- and developing countries, including the Philippines, particularly in remote areas, access to comprehensive echocardiography is limited causing the area to be underserved (Klassen et al., 2021). This disparity has worsened by the deficiency of skilled personnel and equipment (Mocumbi, 2024). Lastly, this study aims to address these gaps by examining cardiac sonographers' experiences, offering insights to improve training and better prepare future professionals in echocardiography (Stoodley & Mason, 2024).

ensuring the credibility of findings without unnecessary redundancy. Additionally, the sample size reflects practical considerations such as time constraints, accessibility of participants across Region IX and Jolo, Sulu, and the depth of engagement required in qualitative data collection and analysis.

### Participants and Setting

The study was done with participants working in the healthcare facilities located in Region IX and Jolo, Sulu, Philippines. A purposive sampling method was implemented that led to the involvement of the 15 cardiac sonographers who had at least six months work experience. Both public and

private healthcare institutions were the workstations of the participants.

### Data Collection

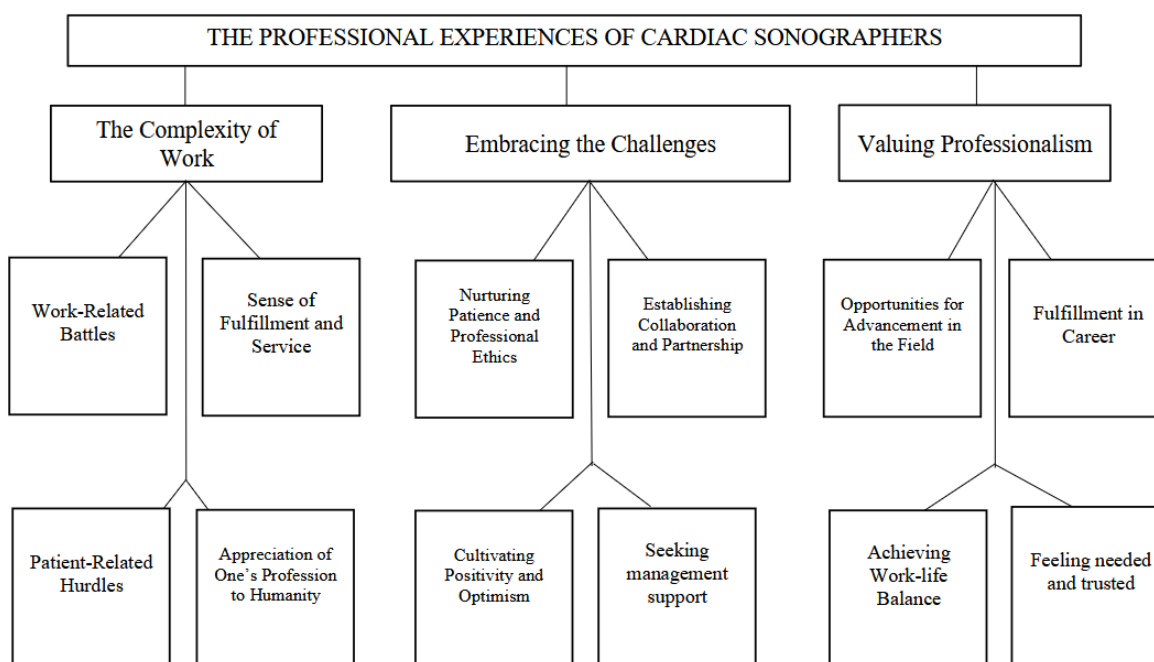
In-depth Interviews and Focus Group Discussions (FGDs) were the qualitative methods that were employed for the data gathering. Interviews that were carried out via in person or through video calls that lasted between 25 to 40 minutes and the recordings were made with the consent of the participants. The transcripts were validated by the participants so as to ensure correctness. The data was transcribed, anonymized, and thematically interpreted to gather the essential insights.

### Ethical Consideration

The researcher requested for approval from the Ethic Review Committee before conducting the study proper. A written consent was acquired from all participants. Confidentiality and privacy were upheld through anonymization, and participants had the privilege to withdraw anytime they wish without questions asked.

### Data Analysis

Thematic was employed in order to identify key themes and subthemes within the data. This guided the whole process, ensuring that findings were rooted in participants' professional experiences.



**Figure 1. Thematic Map of the Professional Experiences of Cardiac Sonographers**

Results

Theme 1: The complexity of work

Cardiac sonographers perform diverse responsibilities which go beyond scanning because they maintain a profound commitment to their work and its meaningful impact.

The role of cardiac sonographers was explored through query “How would you describe your role as a cardiac sonographer? This sought to understand their role beyond

just performing scans. It is about their everyday responsibilities, the difficulties they face, and the way their profession impacts on saving lives. In addition, this question provides insights into their purpose and the meaning behind their profession. Furthermore, they reflect on the technical, emotional, and workplace-related difficulties they encounter. Lastly, it discusses their aspirations on becoming better version of themselves.

Formulated meaning	Subtheme	Theme
Recognizing contribution to healthcare  Valuing impact on patients  Commitment to Accuracy and Professional Growth	Appreciation of one’s profession to humanity	The complexity of work
Finding purpose in work  Satisfaction in patient care  Commitment to helping others	Sense of Fulfillment and Service	
Adapting to difficult situations  Finding solutions under pressure	Work-Related Battles	

Learning from daily experiences	Patient-Related Hurdles	
Seeking career growth opportunities		
Pursuing higher knowledge and skills		
Striving for professional excellence		

Table 1. Professional Experiences of Cardiac Sonographers

**Subtheme 1.1 Appreciation of One’s Profession to Humanity**

In emergency settings or in a point of care ultrasound (POCUS), cardiac sonographers play a pivotal role in providing immediate diagnostic insights therefore improves patient outcomes through timely interventions (Martinez et al., 2023). Their value in diverse healthcare environments emphasizes in their involvement in pediatric echocardiography which has shown to enhance clinical, academic, and financial performance (Arbic et al., 2022). The following are the highlighted statements of the participants.

*"My role is crucial in diagnosing heart conditions such as heart valve disease, heart failure, congenital heart defects, and other cardiovascular issues." (Pulmonary), P7,*

*"As cardiac sonographer, I am pleased and honored because I believe it is a profession in which only a few are fully prepared and capable of perform. Being one and a part of the healthcare team, which primarily aims to detect cardiac anomalies that are both life-threatening and life-impeding. Thus, diagnostic exams are vital for early*

*detections and treatment. a profession performed with passion to saves lives." (Mitral), P1, and*

*"...On the technical side, I’m always learning and refining my skills since machines and techniques are continuously evolving." (Aorta) P3.*

As they reflect on their values and impact on their patient. They have been able to visualize how their profession greatly contributes to patient recovery. Especially when supports are provided by the institution, expertise and skills contribute to overall patient recovery. Patient outcomes have shown to improve because of timely interventions this is due to the technical expertise of cardiac sonographers (Feng et al., 2024). This is evident by the statement of the following participants.

*"As a cardiac sonographer, my primary role is to use ultrasound technology to create images of the heart. My responsibilities include preparing patients, ensuring their comfort, and positioning them correctly for the scan. I conduct echocardiograms using ultrasound transducers to capture images of the heart from various angles. I also analyze*

*and encode data for cardiologists to interpret." (Short Axis), P9,*

*"As a cardiac sonographer, I am pleased and honored, as I believe it is a profession in which only a few are holistically prepared and capable of performing. Being part of the healthcare team that primarily aims to detect cardiac anomalies—both life-threatening and life-impeding—is truly meaningful. Thus, diagnostic exams are vital for early detection and treatment. It is a profession performed with passion to save lives." P1 and*

*"My role involves not only technical expertise but also patient interaction. I aim to deliver accurate scans while ensuring that the patient feels comfortable and well-informed." (Pulse) P15.*

They have recognized that continuous learning and professional growth are essential not only for personal development but also for ensuring accurate diagnoses and high-quality patient care. It is therefore important to understand that, in order to provide patients with the best possible medical decisions, ongoing learning is paramount. Continuous education and feedback mechanisms are crucial to minimizing diagnostic errors and improving technical skills (Taylor, 2023). This is supported by the following participants.

*"The hospital has always been supportive. They send us to echo training sessions and assist with our participation in annual echo conventions. Their ongoing support helps us develop professionally." (Tricuspid) P2,*

*"On the technical side, I'm always learning and refining my skills since machines and techniques are continuously evolving." (Aorta) P3 and*

*"After the procedure, I received feedback from my team, acknowledging the challenges we faced and the effort I put into obtaining the best images." (Pulmonary) P7.*

### **Subtheme 1.2 Sense of Fulfillment and Service**

The field of echocardiography is a novel profession that is often misunderstood as a field only physicians can perform the procedure but evidently all allied medical professionals can also perform this noble profession. Hence, all those professionals who have not found their purpose or still confused about what kind of job they want to spend for the rest of their lives have found their way in cardiac sonography. They found purpose and fulfillment in cardiac sonography and are proud of their role in the field. This may be due to a fact that in the field there is a fair pay, growth, and sets them apart from others. This has been proved by (Santos et al., 2023) that remuneration, leadership style, and opportunities for growth are the factors in improving job satisfaction. The following are the highlighted statements of the participants.

*"Being part of a healthcare team that aims to detect cardiac anomalies, which are life-threatening or life-impeding, provides fulfillment. Diagnostic exams are vital for early detection and treatment, and performing them with passion saves lives."(Mitral) P1,*

*"Delivering high-quality cardiac images to support accurate diagnoses is fulfilling, especially when patients are informed and comfortable." (Pressure) P13, and*

*"Creating detailed cardiac images helps doctors diagnose and manage heart conditions, and ensuring patients feel*



*comfortable makes the role meaningful.” (Short Axis) P9.*

As this study delved deeply into the professional experiences of cardiac sonographers, it became evident that the participants found fulfillment in the care they provide to patients. They prioritize patient comfort and take satisfaction in ensuring a smooth and respectful interaction, especially when examinations are completed efficiently and without complications. According to Yadav and Shree (2024), enhancing patient care begins with job satisfaction among healthcare workers, which is influenced by factors such as workload, compensation, and opportunities for professional development. This is evident in the following participants' responses.

*“...I also ensure patients feel comfortable and explain the process when needed.” (Plax) P10,*

*“Delivering high-quality cardiac images to support accurate diagnoses is fulfilling, especially when patients are informed and comfortable.” (Pressure) P13 and*

*“My responsibilities include patient preparation, ensuring their comfort, and positioning them correctly for the scan.” (Pulmonary) P7.*

Furthermore, a core value shared by healthcare workers is the commitment to

### **Subtheme 1.3 Patient-Related Hurdles**

Patient-related hurdles are inevitable for cardiac sonographers which require both technical competencies and emotional resilience. These challenges may appear as uncooperative patients, complex medical

help others, particularly patients, in all aspects of life. This dedication brings about a deep sense of fulfillment and purpose in service. Compassion serves as a guiding principle in healthcare, helping professionals alleviate suffering and promote well-being (Ling, 2022). This value is reflected in the following participants' reflections.

*“Performing echocardiograms helps cardiologists diagnose and monitor heart conditions, emphasizing the advocacy for better cardiac health.” (Aorta) P3,*

*“Being part of a healthcare team that aims to detect cardiac anomalies, which are life-threatening or life-impeding, provides fulfillment. Diagnostic exams are vital for early detection and treatment, and performing them with passion saves lives.” (Mitral) P1 and*

*“Creating detailed cardiac images helps doctors diagnose and manage heart conditions, and ensuring patients feel comfortable makes the role meaningful.” (Short Axis) P9.*

conditions, or communication barriers. Older patients often have decreased health literacy and cognitive challenges, making communication difficult (White et al., 2024). These situations can increase stress to an already demanding role, having patience and adaptability is vital. Resolving these hurdles

with professionalism and empathy helps ensure quality patient care despite the challenges. The following are the highlighted statements of the participants.

*"As a cardiac sonographer, there are definitely some specific challenges I face in my daily work, like dealing with difficult patients. Sometimes, I encounter patients who are in pain, anxious, or have a lack of understanding. It's important to remain professional and respectful in these situations." (Atrium) P4,*

*"Conversely, there have been instances where poor communication made the job unnecessarily harder." (Wave) P14, and*

*"A Sonographer frequently encounters high stress levels in their work, both physically and emotionally". (Ventricle) P5.*

Communication challenges can complicate both patient interactions and interdisciplinary collaboration for cardiac sonographers. Factors such as language differences, hearing impairments, and patient anxiety can hinder clear communication during procedures. Misunderstandings may lead to repeated instructions, incomplete scans, or delays in diagnosis. Patience, adaptable communication strategies, and cultural awareness are essential for overcoming these barriers. In diverse populations such as South Africa, for instance, language differences significantly affect effective communication among healthcare workers (van Vuuren et al., 2021). The following participants shared their experiences.

*"A challenge I've encountered is when a patient has a poor echo window. It's difficult when your reader (the cardiologist) has specific standards that you can't provide due*

*to this, and communication barriers can also come into play." (Tricuspid) P2 and*

*"Conversely, there have been instances where poor communication made the job unnecessarily harder." (Wave) P14*

*"Most of the patients I encounter are older adults. It's hard to give instructions—some urinate during the procedure, while others may vomit or shout." (Septum) P11.*

The nature of cardiac sonography also brings with it significant physical and emotional demands. Long hours of scanning, repetitive motions, awkward postures, and the mental toll of handling complex or emotionally heavy cases contribute to occupational strain. According to Al Saikhan (2023), approximately 84% of cardiac sonographers report work-related musculoskeletal pain—higher than many other allied healthcare professionals. Prioritizing self-care, maintaining good ergonomics, and establishing support systems are vital for sustaining both physical health and emotional resilience in this profession. Participants emphasized these challenges.

*"Some of the challenges I've faced include a lack of equipment, technical errors, insufficient time, and health issues due to fatigue. After making so many efforts doing ultrasound, our bodies are our weapons, but sometimes we get tired from working non-stop." (Aorta) P3 and*

*"A sonographer frequently encounters high stress levels in their work, both physically and emotionally." (Ventricle) P5.*



#### Sub Theme 1.4 Work-Related Battles

High workload and time constraints are some of the constant challenges faced by cardiac sonographers, often scanning back-to-back with little to no room for rest. The pressure to maintain accuracy while working efficiently can be mentally and physically draining. Tight schedules and high patient volumes can make it difficult to offer the level of care they want to provide. In the study of (Hall et al., 2024) that cardiac sonographers express they have excessive workloads of at least 97% of them experience time pressures and inadequate breaks. The following participants demonstrated. The following are the highlighted statements of the participants.

*"A range of workloads contribute to sonographer stress levels, such as having a hard time finishing the procedure while being detail-oriented and precise with the imaging protocols, which can be challenging at times. stress is the number one factor in our work". (Ventricle) P5,*

*"As a cardiac sonographer in performing daily works, some of the challenges I have faced are physiologic and behavioral aspects of various patients". (Mitral) P1. and*

*"Some of the challenges I've faced include a lack of equipment, technical errors, insufficient time, and health issues due to fatigue. After making so many efforts doing ultrasound, our bodies are our weapons, but sometimes we get tired from working non-stop". (Aorta) P3.*

Physical and mental fatigue also emerged as common struggles due to the demanding nature of their work. Extended scanning hours, maintaining proper posture, and repetitive movements contribute

significantly to physical exhaustion. Mentally, the pressure to produce accurate imaging while simultaneously managing patient interactions can be draining over time. A survey conducted during the COVID-19 pandemic revealed that over two-thirds of cardiac imaging personnel experienced heightened burnout, with many reporting increased anxiety and sleep disturbances (Joshi et al., 2022). As some participants shared.

*"A sonographer frequently encounters high stress levels in their work, both physically and emotionally." (Ventricle) P5 and*

*"As a cardiac sonographer performing daily tasks, some of the challenges I have faced are due to the physiological and behavioral aspects of various patients." (Mitral) P1.*

Moreover, resource limitations and staffing shortages further intensify the daily workload of cardiac sonographers. A lack of adequate equipment, limited institutional resources, understaffed departments, and growing patient volumes can hinder the delivery of efficient, high-quality care. These challenges often result in prolonged waiting times, increased fatigue, and difficulty in maintaining a healthy work-life balance. A recent report noted that in the United States, the number of ultrasound examinations surged by 55.1%, while the number of graduating sonographers increased by only 43.6%, indicating a growing supply-demand gap (Won et al., 2024). Participants echoed similar experiences.

*"Some of the challenges I've faced include a lack of equipment, technical errors, insufficient time, and health issues due to fatigue. After making so many efforts doing ultrasounds, our bodies are our weapons, but*

*sometimes we get tired from working non-stop.” (Aorta) P3,*

*“It’s a mix of good and bad. The institution provides training and encourages collaboration, but the lack of staffing during*

*peak hours makes it harder to cope with workloads.” (Angle) P12 and*

*“Our institution offers solid training opportunities, but we often face resource constraints, like outdated equipment, which adds stress to our work.” (Pressure) P13.*

## Theme 2: Embracing Challenges

Sonographers develop resilience through empathy, teamwork, and mindfulness, enabling them to manage technical, emotional, and patient-related stressors.

The coping strategies of cardiac sonographers were unraveled through the question, “How do you handle stressful or difficult patient interactions and complex cases in your work place?” This question aims to unfold the numerous approaches they utilize to manage the emotional, mental, and

technical demands of their profession. It delves into how they manage stressful circumstances, such as complex cases or high-pressure environments, while keeping focus and delivering quality patient care. Additionally, it delivers insights into the support systems they rely on, whether through colleagues, personal practices, or continuous learning. Lastly, it explores how these coping strategies contribute to their resilience and overall growth as healthcare professionals

Formulated meaning	Subtheme	Theme
Maintaining composure with patients  Upholding integrity in practice  Demonstrating empathy and understanding	Nurturing Patience and Professional Ethics	Embracing the Challenges
Working effectively with colleagues  Building trust within the team	Establishing Collaboration and Partnership	

Sharing knowledge for better care		
Staying present in challenging situations  Focusing on positive outcomes  Practicing self-awareness and balance	Cultivating Positivity and Optimism	
Requesting resources for improvement  Communicating needs for better outcomes  Collaborating with leadership for growth	Seeking Management Support	

**Table 2. Professional Experiences of Cardiac Sonographers**

### **Subtheme 2.1 Nurturing Patience and Professional Ethics**

Maintaining composure with patients is vital, especially when dealing with anxious or uncooperative individuals. It requires patience, empathy, and a firm viewpoint to create a calm environment during the scan. By being composed, cardiac sonographers can communicate more effectively, address patient concerns, and ensure accurate, high-quality imaging, even in high-pressure situations. Calmness fosters a more emphatic approach which can divert difficult patient encounters into rewarding experience (Launer, 2022). The following are the essential statements of the participants.

*"Quite challenging but it's important to our job to stay calm and patient, have empathy, and always listen then provide*

*communication that would help them understand." (Aorta) P3.*

*"I try to remain calm and empathetic, putting myself in the patient's shoes. Focusing on the technical task at hand also helps me avoid getting overwhelmed emotionally." (Pressure) P13, and*

*"Most of the patients I encounter are those elderly or senior citizens. It is hard to give instructions to them that is why having patience is essential, give them time to prepare and make friends with them through giving words of wisdom are also beneficial." (Septum) P11.*

Sticking to ethical standards, regardless of the circumstances, is fundamental in the practice of cardiac sonography. This includes performing scans with accuracy, integrity, and competence, while prioritizing patient comfort and ensuring that every result

reflects the sonographer's best effort. It is about doing what is right—even when no one is watching. The integrity of cardiac sonographers extends to ethical responsibilities such as reporting anomalies or concerns in echocardiographic findings, as these have direct implications for patient care (Kwee et al., 2023). The participants shared the following.

*"I focus on empathy and communication. Letting the patient know they're in safe hands often eases the tension, and it helps me stay composed too." (Angle) P12,*

*"I try to remain calm and empathetic, putting myself in the patient's shoes. Focusing on the technical task at hand also helps me avoid getting overwhelmed emotionally." (Pressure) P13 and*

*"I focus on staying calm and communicating clearly with the patient. Breaking down the task into manageable steps helps me stay in control." (Pulse) P15.*

For cardiac sonographers, patient care goes beyond simply acquiring diagnostic images. It involves recognizing a patient's anxiety, offering reassurance, and treating each person with genuine compassion. This empathetic approach not only enhances the patient's experience but also builds the trust essential for quality healthcare. Informal and sincere interactions in the hospital setting contribute meaningfully to patient well-being and foster a sense of connection between patients and caregivers (Grant et al., 2023). This was highlighted by several participants.

*"It is very vital to create a good rapport with each patient by ensuring the patient fully understands the procedure... and be there for the patient." (Mitral) P1,*

*"Most of the patients I encounter are elderly. It's hard to give instructions... Just a little patience, give them time, or make friends with them by sharing words of wisdom." (Septum) P11 and*

*"For patients who are nervous, I explain every step of the process before the procedure. Knowing what to expect helps calm some nerves." (Pulmonary) P7.*

## **Subtheme 2.2 Establishing Collaboration and Partnership**

Working effectively with colleagues fosters open communication, mutual respect, and a shared commitment to patient care. For cardiac sonographers, this teamwork helps streamline workflows, solve challenges, and maintain a supportive work environment. Whether it is assisting during complex scans or sharing understandings from experience, teamwork plays a key role in delivering accurate and efficient results. A positive, supportive and dynamic team not only makes the job easier but also improves the overall quality of care. Effective teamwork among cardiac sonographers contributes to the streamlined scheduling and execution of scanning tests that improves the overall workflow of cardiac imaging (Juneau et al., 2019). The following are the essential statements of the participants.

*"We're working hand in hand; therefore, our work is correlated to one another." (Tricuspid) P2,*

*"I always feel supported by my colleagues, especially when it comes to special procedures." (Cusp) P6, and*

*"The variety of cases and feedback from more experienced colleagues has helped me improve my scanning techniques." (Pulmonary) P7.*

Building trust within the team creates a work environment where everyone feels supported and valued. For cardiac sonographers, this trust is built through consistent communication, reliability, and a willingness to help each other—especially during busy or challenging situations. When team members trust one another, collaboration becomes more effective, problem-solving is easier, and the quality of patient care improves. Trust within teams involves the open exchange of information, which is crucial in a knowledge-based profession. Without it, skepticism and reluctance may prevail (Gajda, 2024). Employees who actively collaborate and support innovation positively influence productivity (Keefer & Vlaicu, 2024). The following participants emphasized these experiences.

*"I always feel supported by my colleagues, especially when it comes to special procedures." (Cusp) P6,*

*"In one emergency case, the whole team worked seamlessly together to stabilize the patient, which was incredibly reassuring." (Wave) P14 and*

*"After the procedure, I received feedback from my team, acknowledging the challenges*

*we faced and the effort I put into obtaining the best images." (Pulmonary) P7,*

Sharing information and experiences plays a crucial role in delivering high-quality care. Cardiac sonographers often support one another by offering insights, discussing challenging cases, or mentoring less experienced colleagues. This collaborative environment not only fosters team growth but also enhances the accuracy of diagnoses and the overall patient experience. Ultimately, knowledge-sharing contributes to a culture of continuous learning that benefits both practitioners and patients. A study by Zebrowski et al. (2023) highlights that cardiac sonographer contributed significantly to outpatient care, conducting scans for approximately 77% of 35,743 patients—saving cardiologists an estimated 700 hours of scanning annually. The following participants reflected on this collaborative spirit.

*"Boosting professional growth both technically and personally. On the technical side, you're consistently learning and refining your skills." (Aorta) P3,*

*"The variety of cases and feedback from more experienced colleagues has helped me improve my scanning techniques." (Pulmonary) P7 and*

*"Collaboration with the cardiologist and assistance from the team." (Artery) P8.*

Staying present in challenging situations means keeping focus and composure, even when the pressure is high. Cardiac sonographers treat this as staying calm during difficult scans or when patients are anxious or uncooperative. By staying grounded, they can think more clearly, make better

### **Subtheme 2.3 Cultivating Positivity and Optimism**



decisions, and ensure accurate results. It's about being fully engaged in the moment, no matter how tough the situation gets. Techniques such as deep breathing, pausing before answering back, and focusing on the behavior are helpful to maintain composure. Also, de-escalation strategies during challenging moments can mitigate stress (David D Rivedal, Meghan D. Cichocki, Kevin C Chung, n.d.). The following are essential statements of participants.

*"This job has taught me resilience and the importance of staying calm under pressure. It's fulfilling, but I've learned to prioritize self-care to avoid burnout." (Angle) P12,*

*"The experience has made me more patient and adaptable. It has also taught me the value of self-care in maintaining a healthy work-life balance." (Pulse) P15, and*

*"My coping strategies are being a positive thinker, managing time well, taking things as learning experiences. I love listening to music, appreciating the calmness of nature, and being a God-centered individual." (Mitral) P1.*

Concentrating on positive results means maintaining a hopeful, solution-oriented mindset—even in the face of difficult cases. Cardiac sonographers often emphasize the importance of looking beyond the challenges and remembering the impact of their work on patients' lives. This optimistic perspective not only helps them manage stress but also motivates them to provide high-quality care. As Eric Kallstrom (2024) states, a positive mindset is evident when cardiac sonographers enhance patient care through quality imaging and appropriate use of ultrasound-enhancing agents. The following participants shared.

*"It is always fulfilling to me at the end of the day knowing that I overcame all the challenges I faced at work. It gives me motivation to do my best as a cardiac sonographer." (Cusp) P6,*

*"The experience has made me more patient and adaptable. It has also taught me the value of self-care in maintaining a healthy work-life balance." (Pulse) P15 and*

*"Exposure to diverse cases has expanded my understanding of cardiovascular health." (Pulmonary) P7.*

Self-awareness and emotional steadiness are essential in a demanding healthcare role. Recognizing personal limits, stepping back when needed, and seeking support are key strategies in managing both emotional and physical stress. Being in tune with one's well-being helps prevent burnout and sustains motivation, ultimately resulting in better patient care. Madeline Timm (2023) found that emotional self-awareness is linked to healthier coping strategies and reduced work-related stress. Participants reflected on their approaches.

*"My coping strategies are being a positive thinker, managing time well, and taking things as learning experiences. I love listening to music, appreciating the calmness of nature, and being a God-centered individual." (Mitral) P1,*

*"Taking easy steps and not rushing everything—being calm is one way to ease stress." (Aorta) P3,*

*"For me, self-care means making time for myself each day to do something I enjoy, even just taking a bath. I've learned to set*



*boundaries between work and personal life to prevent burnout.” (Atrium) P4 and*

*“There’s more than meets the eye. Like most allied health professionals, stress is the number one factor in our work, but a sonographer must always prioritize themselves.” (Ventricle) P5.*

Bringing enthusiasm into the workplace involves embracing a positive attitude and a genuine passion for the profession. For cardiac sonographers, this enthusiasm fuels perseverance during long shifts or challenging cases. It enhances not only individual performance but also positively influences patients and coworkers. A study by Sevgi Emirza (n.d.) observed that healthcare workers with a positive mindset during the COVID-19 pandemic showed reduced levels of anxiety, depression, and exhaustion. Participants affirmed.

*“It is rewarding yet challenging—a commitment to lifelong learning. I find it fulfilling to know that I can contribute to patient care through my skills.” (Angle) P12,*

*“At the end of a challenging day, it’s fulfilling to know I’ve overcome obstacles, and it motivates me to do my best as a cardiac sonographer.” (Cusp) P6 and*

*“Practicing cardiac sonography has always been a learning process in which I aim to further enhance and develop. It has a direct influence on my personal and professional growth, making me more self-aware, empathetic, and enthusiastic in discovering new skills and innovations.” (Mitral) P1*

Remaining connected to a sense of purpose is essential—especially when the workload becomes overwhelming. For cardiac

sonographers, this may involve navigating difficult cases, learning from errors, and continuously striving to provide exceptional care. The emergence of new technologies, such as AI integration in echocardiography, also presents challenges that require adaptability and a growth mindset (Huh et al., 2024). Participants shared their reflections.

*“Whether it involves patients with unusual anatomy or severe disease, adaptability is the key. Adjusting imaging techniques and collaborating with the team keeps me focused even during tough cases.” (Short Axis) P9 and*

*“Handling difficult situations is part of the job, but it’s important to have strategies in place to manage stress and maintain a positive attitude. By prioritizing patient care, seeking support, and practicing self-care, I can continue to provide compassionate and effective care.” (Atrium) P4.*

Each scan and interaction represent more than a technical task—it contributes to timely diagnosis and quality patient care. By recognizing the significance of their role, cardiac sonographers find purpose even in routine responsibilities. Meaningful work, shaped by a sense of purpose, social connection, and self-worth, enhances both personal satisfaction and professional commitment (Mursyidi et al., 2024). The following participants expressed.

*“Being a cardiac sonographer has had a profound impact on my professional growth and well-being; it shaped my perspective on healthcare and instilled in me a deep sense of purpose.” (Atrium) P4,*

*"It provides a sense of fulfillment, pride, and purpose, as you're helping to improve or save lives." (Pulmonary) P7 and*

*"It is always fulfilling to me at the end of the day knowing that I overcame all the challenges that I had faced at work. It gives me motivation to do my best as a cardiac sonographer." (Cusp) P6.*

### **Subtheme 2.4 Seeking Management Support**

Demanding resources for improvement shows a commitment to growth and delivering better patient care. This can be by requesting for updated equipment, seeking training opportunities, or attending conferences to stay updated with best practices. Proactively seeking these resources helps them improve their skills and adjust to the evolving demands of the profession. It's a practical step toward continuous learning and professional growth. In a study of (Sganga et al., 2022), cardiac sonographers who contribute to Quality Initiatives (QI) such as identifying areas needing improvement showed a 44% reduction in diagnostic errors. The following are the essential statements of participants.

*"Our institution offers solid training opportunities, but we often face resource constraints, like outdated equipment, which adds stress to our work." (Pulse) P15,*

*"The institution provides some support, but more emphasis on mental health resources would be beneficial." (Pressure) P13, and*

*"By giving me a chance and allowing me to suggest what the best machine is, it provides good detail for patient diagnosis." (Septum) P11.*

Cardiac sonographers actively express their needs in the workplace by speaking up about the tools, support systems, or modifications necessary to perform at their best. This includes advocating for equipment upgrades, requesting specialized training, or working collaboratively to streamline workflows. Clear and timely communication helps address issues early, leading to improved accuracy and more effective patient care. Proactively voicing their concerns also supports professional growth and upholds the high standards expected in the field. According to Vaughan and Jolliffe (2023), open discussions about psychological and professional needs help reduce anxiety and strengthen workplace relationships, fostering a more inclusive environment. Similarly, Ahlstedt et al. (2020) found that nurses experience enhanced motivation and job satisfaction when they communicate their needs effectively. The participants shared.

*"The institution provides some support, but more emphasis on mental health resources would be beneficial." (Pressure) P13,*

*"Helpful resources include updated equipment and training. Least helpful are the lack of tailored solutions for workplace challenges." (Pulse) P15 and*

*"That's a great question. It's important to evaluate the effectiveness of resources and support in a workplace. What I find most helpful is continuing education—the institution offers a wide range of courses, workshops, and conferences. This keeps me up to date with the latest advancements in*

*ultrasound technology and cardiology, ensuring I'm providing the best possible care to patients. These resources contribute directly to my professional development and job satisfaction.” (Atrium) P4.*

Beyond identifying needs, cardiac sonographers take an active role in collaborating with their supervisors or employers to improve processes and outcomes. They participate in discussions, share field insights, suggest innovations, and engage in professional development initiatives. These collaborative efforts strengthen the link between administrative planning and real-time clinical demands, ultimately enhancing patient care and fostering a supportive work environment. As Lee (2024) suggests, open communication between employees and leadership promotes mutual understanding and cooperation toward shared goals. Additionally, regular feedback and open idea exchanges are crucial to addressing challenges and building a cohesive team environment (Chernenko, 2023). The participants noted.

*“By giving me a chance and allowing me to suggest what the best machine is for accurate patient diagnosis.” (Septum) P11,*

*“My institution has helped a lot in professional development, but some other supports have been inadequate.” (Mitral) P1 and*

*“The institution provides everything a sonographer could ask for.” (Ventricle) P5,*

### **Theme 3: Valuing Professionalism**

This section contains the valuable lessons or experiences have gained by cardiac sonographers from their work that they would like to share with others. This seeks to uncover the knowledge and experiences sonographers have acquired throughout their careers, offering a deeper understanding of the profession beyond technical skills. It highlights the practical insights gained from handling complex cases, working with diverse patient populations, and collaborating with multidisciplinary teams. Additionally, it examines how sharing these experiences can contribute to the growth and learning of fellow professionals, fostering a supportive and knowledge-driven work environment. Ultimately, these shared insights aim to inspire continuous learning and improvement within the field

#### **Subtheme 3.1 Opportunities for Advancement in the Field**

They invest in personal and professional growth, such as pursuing higher education and training. They stay updated with new techniques, technologies, and best practices to provide better patient care. Whether through workshops, certifications, or advanced degrees, continuous learning helps them feel more confident and capable in their role. It's a way to grow their skills, stay motivated, and keep up with the evolving demands of the profession. It is evident during Covid-19 that healthcare workers often seek further training in order to enhance their clinical practice and fulfill continuing education (Jones et al., 2023). The following are the important statements of participants.

*"Attending annual conventions and lectures is one of the most helpful supports I receive for my professional development." (Tricuspid) P2,*

*"I share my experiences with new colleagues when they join our unit, especially regarding challenging cases or how to communicate effectively with patients." (Plax) P10, and*

*"Access to state-of-the-art ultrasound machines helps me perform my job efficiently and motivates me to learn more." (Plax) 10.*

Cardiac sonographers seek growth by willingly taking on roles with increased responsibility. Whether it's mentoring a new colleague, assisting in complex procedures, or contributing to quality improvement initiatives, these actions not only enhance departmental efficiency but also nurture both personal and professional development. For many, it's about making a greater impact on patient care and becoming more engaged members of the healthcare team. According to Cyphers and Kuflik (2023), healthcare workers who assume greater responsibilities often engage more deeply with the ethical dimensions of their roles, advocating for justice and equity in patient care. The participants reflected on these opportunities.

*"As someone who is new to the field, I am grateful to have my senior with me on this journey. They always make sure that I am supported and guided." (Short Axis) P9,*

*"Our institution provides opportunities for professional development, and I've been involved in some workshops to help improve our imaging techniques." (Pulmonary) P7 and*

*"I share my experiences with new colleagues when they join our unit, especially regarding challenging cases or how to communicate effectively with patients." (Plax) P10.*

In addition to seeking greater responsibility, cardiac sonographers express a desire to explore new skills and earn certifications to stay current in their field. This includes learning advanced imaging methods, participating in specialized training programs, and attending conferences. Such endeavors not only enhance their technical proficiency but also strengthen their confidence in handling complex or unfamiliar cases. Continuous education ensures they can adapt to evolving technologies and standards, ultimately improving patient outcomes. Zhou et al. (2024) emphasized that training in dynamic sequential cross-sectional (SCS) imaging enhances diagnostic capabilities and efficiency, particularly in identifying congenital heart diseases. The participants shared their experiences.

*"The institution supports my professional continuing education by allowing me time off for relevant courses." (Cusp) P6,*

*"The institution offers a wide range of continuing education—courses, workshops, and conferences. This keeps me up to date with the latest advancements in ultrasound technology and cardiology, ensuring I'm providing the best possible care to patients." (Atrium) P4 and*

*"Access to state-of-the-art ultrasound machines helps me perform my job efficiently and motivates me to learn more." (Plax) P10.*

### Subtheme 3.2 Achieving Work-life Balance

Allotting time to rest, recharge, and enjoy life is one way to support personal well-being. The demands of the job can be exhausting, making it essential to prioritize self-care. Whether it is through hobbies, exercise, or quality time with family, these breaks help maintain mental and emotional resilience. Self-prioritization among healthcare professionals is important in order to provide better quality care because their emotional and physical well-being directly affect patient experience (Rokach & Patel, 2023). The following are the important statements of participants.

*"Taking short breaks when I can and doing mindfulness exercises at home have been helpful. Talking to friends or family outside of work gives me a fresh perspective too."(Angle) P12.*

*"Setting boundaries—knowing when to say no or when to step back—is crucial for preventing burnout."(Artery) P8, and*

*"The most effective for me is family time. I forget my stress at work."(Cusp) P6.*

Cardiac sonographers recognize the importance of stepping back and prioritizing personal well-being by setting boundaries between their work and personal lives. This may involve managing their workload, saying "no" when necessary, or taking breaks during long shifts. By creating these boundaries, they can prevent exhaustion and maintain a healthy, sustainable approach to their work. Protecting their energy enables them to continue providing high-quality care

without feeling overwhelmed. Research by Herbst et al. (2023) shows that setting boundaries in the workplace helps healthcare professionals manage emotional energy and workload, reducing the risk of compassion fatigue and burnout. The following participants shared their strategies for maintaining these boundaries.

*"I've learned to set boundaries between my work life and personal life to prevent burnout." (Atrium) P4,*

*"Setting boundaries—knowing when to say no or when to step back—is crucial for preventing burnout." (Artery) P8 and*

*"For me, self-care includes resetting boundaries between work and personal life to avoid getting overwhelmed." (Pressure) P13.*

For cardiac sonographers, balancing career and family life can be particularly challenging due to unpredictable schedules and demanding workloads. However, making time for family, while staying committed to their professional responsibilities, helps maintain a sense of fulfillment in both areas. By learning to manage their time effectively and setting clear boundaries, they can be present for both their patients and loved ones. Coping strategies, such as family support, can also reduce the negative effects of stress, fostering resilience and improving family functioning (Siddiqui et al., 2024). The following participants expressed how family time helps them cope.

*"Spending time with family helps me recharge. Focusing on the positives of my work also keeps me motivated." (Wave) P14,*

*"The most effective for me is family time. I forget my stress at work." (Cusp) P6 and*



### Subtheme 3.3 Fulfillment in Career

Experiencing a sense of determination is feeling connected to the profound meaning behind the work. For them it is not just about performing scans but knowing that their efforts contribute to life-saving diagnoses and better patient outcomes. This sense of purpose grows when they see how their skills and dedication make a real difference. It's what keeps them motivated to show up each day, even when the job gets tough. Sense of purpose is beneficial for healthcare professionals who facing high level of stress and also it is important because it is linked to healthier cognitive aging and better emotional outcomes (Sutin et al., 2022). The following are the important statements of participants.

*"For me it's hard but fulfilling at the same time, knowing that I can help people as well as doctors to give diagnosis to their patients." (Cusp) P6, and*

*"I feel proud and fulfilling that in each patient we encounter, I am able to make a difference and touch their lives." (Mitral) P1.*

For cardiac sonographers, the impact of their work brings a profound sense of fulfillment. Moments such as producing a clear scan that leads to a timely diagnosis or receiving gratitude from a patient for compassionate care serve as powerful reminders of their role in the healthcare journey. These experiences show that their responsibilities extend far beyond interpreting images—they directly contribute to patient outcomes and well-being. According to Zebrowski et al. (2024), involving cardiac sonographers in diagnostic

and treatment processes not only enhances clinical efficiency but also improves patient access to care. Participants in this study reflected on how these meaningful encounters fuel their motivation.

*"Despite the stress, I've learned to appreciate the impact I have on patient care." (Pressure) P13,*

*"I feel proud and fulfilling that in each patient we encounter I am able to make a difference and touch their lives." (Mitral) P1 and*

*"For me it's hard but fulfilling at the same time knowing that I can help people as well as doctors to give diagnosis to their patients." (Cusp) P6.*

Participants also take pride in the progress they have made through dedication and perseverance. Whether it's mastering complex imaging techniques or confidently managing difficult cases, these milestones reflect personal and professional growth. Achievements such as earning certifications, attending workshops, and receiving positive feedback further strengthen their commitment to excellence in patient care. This continuous development not only affirms their capabilities but also inspires them to keep evolving in their careers. As shared by the participants.

*"Offers access to workshops, seminars, and training, where I can learn the latest updates in ultrasound technology, cardiac health, and patient care." (Pulmonary) P7,*

*"Continuing education opportunities help maintain and improve our skills and stay updated on new technologies and techniques." (Plax) P10 and*



*"Attending the annual conventions and lectures helps me stay up to date with advancements." (Tricuspid) P2.*

### **Subtheme 3.4 Feeling needed and Trusted**

Being relied upon for expertise gives cardiac sonographers a sense of responsibility and pride in their work. It is when colleagues seek their input during complex cases or trust them to capture critical images for accurate diagnoses. This recognition validates the years of training and experience they have invested in their craft. Knowing that their skills make a difference motivates them to continue honing their expertise and delivering high-quality care. Employees who rely on each other foster a culture of respect and recognition of each professional's expertise which is important for effective teamwork (Zwitter, 2019). The following are the important statements of participants.

*"As someone who is new to the field, I am grateful to have my seniors with me in this journey of work—they always make sure that I am supported and guided." (Ventricle) P5,*

*"They offer time off for relevant courses, which helps me grow as a professional and maintain my credentials." (Artery) P8, and*

*"When the institution provides adequate resources, it boosts confidence and morale." (Pressure) P13.*

For cardiac sonographers, confidence is often built upon the trust and support they receive from their team. This trust is established by doctors, nurses, and fellow sonographers recognizing the sonographer's expertise in capturing crucial images for accurate diagnoses. When trust is present,

sonographers feel empowered, especially in handling challenging cases or making quick decisions under pressure. It creates a positive work environment where they feel motivated to continue growing and refining their skills. Research by McKee et al. (2024) highlights that when teamwork thrives due to mutual trust, it leads to fewer instances of miscommunication and medical errors. The following participants shared their experiences of the trust they feel from their colleagues and institution.

*"Honestly speaking, my institution gives a lot of priority to the field of 2D echocardiography, giving me a chance and allowing me to suggest what the best machine is for better patient diagnosis." (Septum) P11,*

*"They offer time off for relevant courses, which helps me grow as a professional and maintain my credentials." (Artery) P8 and*

*"When the institution provides adequate resources, it boosts confidence and morale." (Pressure) P13.*

Cardiac sonographers also find confidence in recognizing the importance of their role within the healthcare team. Each scan and patient interaction contributes to a larger picture of diagnosis and treatment, helping doctors make informed decisions about heart conditions. Understanding this impact brings a sense of pride and reinforces their dedication to providing high-quality care. Alghamdi et al. (2024) suggest that healthcare professionals who acknowledge their roles tend to show better communication and empathy, which

ultimately improves patient outcomes. As shared by the participants.

*period, I ensure time management and prioritization.” (Short Axis) P9.*

*“By prioritizing patient care, seeking support, and practicing self-care, I can continue to provide compassionate and effective care to my patients.” (Atrium) P4 and*

*“In busy hospital settings, where there’s a high volume of patients to see in a short*

Formulated meaning	Subtheme	Theme
Pursuing higher education and training  Seeking roles with greater responsibility  Exploring new skills and certifications	Opportunities for Advancement in the Field	Valuing Professionalism
Managing time for personal well-being  Setting boundaries to avoid burnout  Prioritizing both career and family	Achieving Work-life Balance	
Experiencing a sense of purpose  Seeing the impact of one's work  Feeling proud of professional growth	Fulfillment in Career	
Being relied upon for expertise  Gaining confidence from team trust  Recognizing the importance of one’s role	Feeling needed and Trusted	

**Table 3. Professional Experiences of Cardiac Sonographers**

### **Discussion**

The findings of this research are consistent with the global literature on the workforce challenges in cardiac sonography. One of the main reasons is the lack of standardization in the training and certification of different countries. However, in this case, the resilience, adaptability, and the commitment of the participants towards patient care show that the formulation of policies that are precisely targeting the issues can result in the enhancement of job satisfaction and the sustainability of professionals.

### **Implications for Practice**

- Sonographers are being motivated to join the process of continuous learning and professional development.
- Healthcare Institutions: It is mandatory to supply adequate resources, updated equipment, and provide mental health support for the sonographers.
- Policymakers: The establishment of standardized protocols for curricula and certification is a key requirement to guarantee the same level of competency across the regions.

### **Conclusion**

Cardiac sonographers have a significant impact on patient care, but they encounter various challenges in their careers. Their flexibility, teamwork, and willingness to look for growth opportunities are examples of their commitment to the field. Tackling systemic problems by means of organizational and policy backing would not only better their job experiences but also lead to better patient care.

### **Recommendations**

- Strengthen training programs to address educational gaps.
- Implement mental health support initiatives for sonographers.
- Advocate for updated guidelines on the scope of practice and certification standards.
- Future researcher may Include a much larger sample size to capture a wide range of insights.
- Improve access to modern echocardiography equipment.
- Create an independent body Similar to the Department of Health & PRC that would govern the cardiac sonography practice.
- Advocate for revised guidelines regarding the scope of practice and the certification standards
- Ensure the availability of advanced equipment such as echocardiography machines
- Establish an organization that is dedicated only for licensing cardiac sonographers.

## References

- Al Saikhan, L. (2023). Prevalence, characteristics, consequences, and awareness of work-related musculoskeletal pain among cardiac sonographers compared with other healthcare workers in Saudi Arabia: A cross-sectional study. *PLOS ONE*, 18(5), e0285369. <https://doi.org/10.1371/journal.pone.0285369>
- Alghamdi, M. A. M., Al Shehri, T. S., Alnihier, M. M. H., Ali Alshahri, A. H., Alwaked,
- Arbic, N., Venet, M., Iriart, X., Dragulescu, A., Thambo, J., Friedberg, M. K., Guerra, V., Morgan, C. T., Mertens, L., & Villemain, O. (2022). Organization of Pediatric Echocardiography Laboratories: Impact of sonographers on clinical, academic, and financial performance. *Frontiers in Pediatrics*, 10.
- B. A., Cosyns, B., Edvardsen, T., Petersen, S. E., Carvalho, R. F., Cameli, M., & Dweck, M. R. (2022). EACVI survey on burnout amongst cardiac imaging specialists during the 2019 coronavirus disease pandemic. *European Journal of Echocardiography*, 23(4), 441–446. <https://doi.org/10.1093/ehjci/jeac002>
- Carina Ahlsted, Carin Eriksson Lindvall, Inger Holmström, Inger Holmström, & Åsa Muntlin, Åsa Muntlin. (2020). Flourishing at work: Nurses' motivation through daily communication - An ethnographic approach. *Nursing & Health Sciences*, 22(4), 1169–1176. <https://doi.org/10.1111/NHS.12789>
- Chandra, B. S., & Jana, S. (2019). Towards Next-Generation cardiac care in Resource-Constrained and High-Risk scenarios. *SciSpace - Paper*. <https://typeset.io/papers/towards-next-generation-cardiac-care-in-resource-constrained-4y6v2vfs9v>
- Chen, M., Ye, Q., Chen, R., Huang, N., Zheng, L., Qiu, L., Kang, D., & Chen, X. (2024). Comparative Evaluation of Focused Cardiac Ultrasound Training Programs: Cardiac Sonographers-led vs. Senior Intensivists-led. *Research Square (Research Square)*. <https://doi.org/10.21203/rs.3.rs-4364399/v1>
- Chernenko, M. (2023). Collaboration. *Collaboration*, 125–136. [https://doi.org/10.1007/978-1-4842-9795-7\\_10](https://doi.org/10.1007/978-1-4842-9795-7_10)
- David D Rivedal, Meghan D. Cichocki, Kevin C Chung. (n.d.). Dealing with Difficult People and Why It Matters. *Plastic and Reconstructive Surgery*, 152, 923–928. <https://doi.org/10.1097/prs.00000000000010790>
- David D Rivedal, Meghan D. Cichocki, Kevin C Chung. (n.d.). Dealing with Difficult People and Why It Matters. *Plastic and Reconstructive Surgery*, 152, 923–928.

- https://doi.org/10.1097/prs.00000000000010790
- Eric Kallstrom. (2024). Ultrasound-Enhancing Agent and IV Administration in Cardiac Sonography: How Sonographers Play a Key Role in Positively Affecting Key Performance Indicators. *Journal of Diagnostic Medical Sonography*. https://doi.org/10.1177/87564793241230982
- Feng, T., Guo, Z., Su, H., Zhang, F., Zhu, H., Wang, A., Jiang, K., & Li, B. (2024). Progress in the Use of Echocardiography in Patients with Tumors. *Reviews in Cardiovascular Medicine*, 25(1), 22. https://doi.org/10.31083/j.rcm2501022
- Gajda, J. (2024). Trust is a Factor Determining the Sharing of Knowledge Among Employees of Modern Organizations. *European Conference on Knowledge Management*, 25(1), 245–252. https://doi.org/10.34190/eckm.25.1.2845
- Grant, M. P., Philip, J. a. M., Deliens, L., & Komesaroff, P. A. (2023). ‘It’s communication between people who are going through the same thing’: experiences of informal interactions in hospital cancer treatment settings. *Supportive Care in Cancer*, 31(7). https://doi.org/10.1007/s00520-023-07900-6
- Hagen-Ansert, S., & Billick, K. (2023). The challenges of educating a cardiac sonography workforce. *Journal of Diagnostic Medical Sonography*, 39(4), 414–420. https://doi.org/10.1177/87564793231168776
- Hall, C., Pignata, S., Tie, M., Bezak, E., & Childs, J. (2024). Sonographer wellbeing in Australia: Perceptions of job demands and resources in clinical working environments. *Sonography*. https://doi.org/10.1002/sono.12417
- Harrison, G., & Beardmore, C. (2019). Ultrasound clinical teaching capacity in England: A scoping exercise. *Radiography*, 26(1), 3–8. https://doi.org/10.1016/j.radi.2019.09.005 https://doi.org/10.3389/fped.2022.891360
- Jaeyoung Huh, Paul Klein, Gareth Funka-Lea, Puneet Sharma, Ankur. (2024). AI-driven View Guidance System in Intra-cardiac Echocardiography Imaging. *AI-driven View Guidance System in Intra-cardiac Echocardiography Imaging*. https://doi.org/10.48550/arxiv.2409.16898
- Jennifer Jones, Jamie Johnston, Ngouille Ndiaye, Anna Tokar, Shweta Singla, Nadine Ann Skinner, Matthew Strehlow, & Heini Utunen. (2023). Healthcare Workers’ Motivations for Enrolling in Massive Open Online Courses During a Public Health Emergency: Evidence from a Case Study of COVID-19 Training (Preprint). *Healthcare Workers Motivation During Covid-19*. https://doi.org/10.2196/preprints.51915

- Joshi, S. S., Stankovic, I., Demirkiran, A., Haugaa, K. H., Maurovich-Horvat, P., Popescu, Juneau, D., Chow, B. J. W., Beanlands, R., & Crean, A. M. (2019). Heart teams for cardiac imaging: the right test at the right time for the right patient. In Springer eBooks (pp. 109–125). [https://doi.org/10.1007/978-3-030-19124-5\\_8](https://doi.org/10.1007/978-3-030-19124-5_8)
- Juneau, D., Chow, B. J. W., Beanlands, R., & Crean, A. M. (2019). Heart teams for cardiac imaging: the right test at the right time for the right patient. In Springer eBooks (pp. 109–125). [https://doi.org/10.1007/978-3-030-19124-5\\_8](https://doi.org/10.1007/978-3-030-19124-5_8)
- Keefer, P., & Vlaicu, R. (2024). Employee trust and performance constraints in public sector organizations. *European Journal of Political Economy*, 81, 102503. <https://doi.org/10.1016/j.ejpoleco.2024.102503>
- Klassen, S. L., Nunes, M. C., Johri, A., McClanahan, C., & Picard, M. H. (2021). Focused cardiac ultrasound for the evaluation of heart valve disease in Resource-Limited Settings. *Current Treatment Options in Cardiovascular Medicine*, 23(12). <https://doi.org/10.1007/s11936-021-00945-y>
- Kwee, R. M., Almaghrabi, M. T., & Kwee, T. C. (2023). Integrity in cardiovascular imaging research. *Clinical Imaging*, 96, 31–33. <https://doi.org/10.1016/j.clinimag.2023.01.011>
- Launer, J. (2022). Dealing with difficult patients – by dealing with difficult doctors. *Postgraduate Medical Journal*, 98(1162), 649–650. <https://doi.org/10.1136/postgradmedj-2022-141976>
- Lee, W., Chen, S., & Wan, Y. (2021). History of the Asian Society of Cardiovascular Imaging. *Korean Journal of Radiology*, 22(4), 493. <https://doi.org/10.3348/kjr.2020.1460>
- Ling, D. (2022). Compassion in healthcare. In Routledge eBooks (pp. 37–46). <https://doi.org/10.4324/9781003330745-5>
- M. H., & Alshammari, N. M. S. (2024). The Significance of Enhancing Health Workers’ Skills and Knowledge in Driving Positive Patient Experiences. *International Journal of Religion*. <https://doi.org/10.61707/3t59q326>
- Madeline Timm. (2023). Emotional Self-Awareness, Self-Care, and Occupational Stress in Mental Health Professionals. *Advances in Human Resources Management and Organizational Development Book Series*, 237–253. <https://doi.org/10.4018/978-1-6684-6543-1.ch017>
- Magno, J. D. A., Ubaldo, R. J. C., Nunez, J. B., Cornel, M. U., Cuyco, R. E., Tucay, E. S., & Santos, R. J. (2023). The State of Cardiovascular Resources and Expertise in Echocardiography Nationwide: The Philippine Survey on



- Echocardiography (The PHIL-SCREEN Study). *Philippine Journal Cardiology*, 51(2), 10–24. <https://doi.org/10.69944/pjc.4f0a88da4e>
- Martinez, E. C., Diarte, E., Martinez, D. O., Reyes, L. R., Cano, D. a. A., Navarro, C. C., Zurita, M. G. Y., Escamilla, D. A., Choudhari, J., & Michel, G. (2023). Point-of- Care Ultrasound for the Diagnosis of Frequent Cardiovascular Diseases: A Review. *Cureus*. <https://doi.org/10.7759/cureus.51032>
- McKee, M., van Schalkwyk, M. C., Greenley, R., & Permanand, G. (2024). Placing Trust at the Heart of Health Policy and Systems. *International Journal of Health Policy and Management*. <https://doi.org/10.34172/ijhpm.2024.8410>
- Mocumbi, A. O. (2024). Cardiovascular health care in Low- and Middle-Income countries. *Circulation*, 149(8), 557–559. <https://doi.org/10.1161/circulationaha.123.065717>
- Mohammad Mursyidi Saraih, Khairun Nisa' Khairuddin, Naiemah Ummi, & Saraih. (2024). The effect of sense of purpose, social connection, and self-esteem on meaningful work. *The Effect of Sense of Purpose, Social Connection, and Self- esteem on Meaningful Work*. <https://doi.org/10.58915/johdec.v12.2023.631>
- Perry, R., Forshaw, A., Childs, J., Chester, D., & Edwards, C. (2024a). Cultivating competency in cardiac sonography: aligning entrustable professional activities with industry expectations. *Heart Lung and Circulation*, 33(7), 1067–1073. <https://doi.org/10.1016/j.hlc.2024.01.027>
- Rokach, A., & Patel, K. K. (2023). Coping with Burnout in the Healthcare Field. *OBM Integrative and Complimentary Medicine*. <https://doi.org/10.21926/obm.icm.2304042>
- Santos, M., Almeida, A., & Lopes, C. (2023). Satisfação laboral. *Revista Portuguesa De Saúde Ocupacional*, 15, 107–119. <https://doi.org/10.31252/rpso.25.02.2023>
- Santos, M., Almeida, A., & Lopes, C. (2023). Satisfação laboral. *Revista Portuguesa De Saúde Ocupacional*, 15, 107–119. <https://doi.org/10.31252/rpso.25.02.2023>
- Sevgi Emirza. (n.d.). Protecting healthcare workers' mental health against COVID-19- related stress: The effects of stress mindset and psychological resilience. *Nursing & Health Sciences*, 25(2), 216–230. <https://doi.org/10.1111/nhs.13018>
- Sganga D, Behera S, Beattie MJ, Stauffer KJ, Burlinson A, Lopez L, Tierney ESS. Quality Improvement in a Pediatric Echocardiography Laboratory: A Collaborative Process. *Children (Basel)*. 2022 Nov 28;9(12):1845. doi: 10.3390/children9121845.

- PMID: 36553289; PMCID: PMC9776848.
- Stoodley, P., & Mason, G. (2024). Sonographic imaging education for sonographers versus health professionals: A literature review. *Sonography*, 11(2), 88–99. <https://doi.org/10.1002/sono.12399>
- Sutin, A. R., Luchetti, M., & Terracciano, A. (2022). The benefits of a sense of purpose in life for healthier cognitive aging. *International Psychogeriatrics*, 34, 1015–1017. <https://doi.org/10.1017/S104161022000837>
- Taylor, J. C. (2023). Mitigating diagnostic errors with Point-of-Care Ultrasonography: a new framework. *Texas Heart Institute Journal*, 50(4). <https://doi.org/10.14503/thij-23-8234>
- Van Vuuren, C., van Dyk, B., & Mokoena, P. L. (2021). Overcoming communication barriers in a multicultural radiography setting. *Health Sa Gesondheid*, 26, 1568. <https://doi.org/10.4102/HSAG.V26I0.1568>
- Vaughan, H. C., & Jolliffe, T. (n.d.). ‘Why it’s important to talk about our toilet needs in the workplace’ – Using Maslow’s Needs Theory to Shine a Light on Workers Living with IBD in the Workplace. The Qualitative Report. <https://doi.org/10.46743/2160-3715/2023.5102>
- White, A., Humphreys, L., & Oomens, D. (2024). Considerations of communication challenges facing sonographers in Australia beyond 2024: An ageing population, ageism and maintaining the focus on patient-centred care. *Sonography*. <https://doi.org/10.1002/sono.12406>
- Won, D., Walker, J., Horowitz, R., Bharadwaj, S., Carlton, E., & Gabriel, H. (2024a). Sound the Alarm: The Sonographer Shortage is Echoing Across Healthcare. *Journal of Ultrasound in Medicine*, 43(7), 1289–1301. <https://doi.org/10.1002/jum.16453>
- Won, D., Walker, J., Horowitz, R., Bharadwaj, S., Carlton, E., & Gabriel, H. (2024a). Sound the Alarm: The Sonographer Shortage is Echoing Across Healthcare. *Journal of Ultrasound in Medicine*, 43(7), 1289–1301. <https://doi.org/10.1002/jum.16453>
- Yadav, B., & Shree, G. J. (2024). Job satisfaction of health care workers in hospitals. *International Journal of Multidisciplinary Research in Science, Engineering and Technology*, 7(05), 9880–9892. <https://doi.org/10.15680/ijmrset.2024.0705044>
- Zebrowski, P., Schlotter, N., Gibelin, S., Broizat, J., Boiron, F., Mann, H., Alilouch, P., Sabatier, T., & Jamal, F. (2023c). How do sonographers improve access to cardiology care? An outpatient studies. *Archives of Cardiovascular Diseases Supplements*, 15(3), 251–252. <https://doi.org/10.1016/j.acvdsp.2023.04.018>

Zebrowski, P., Schlotter, N., Gibelin, S., Broizat, J., Boiron, F., Mann, H., Alilouch, P., Sabatier, T., & Jamal, F. (2023b). How do sonographers improve access to cardiology care? An outpatient studies. Archives of Cardiovascular Diseases Supplements, 15(3), 251–252.

<https://doi.org/10.1016/j.acvdsp.2023.04.018>

Zwitter, M. (2019). Relations in the Medical Team (pp. 53–56). Springer, Cham. [https://doi.org/10.1007/978-3-030-00719-5\\_8](https://doi.org/10.1007/978-3-030-00719-5_8)