

Observing the Clinical use of Ultrasound Imaging by Physiotherapists in Saudi Arabia

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Abstract

Objective: This study aimed to design a questionnaire to survey physiotherapists' use of ultrasound imaging (USI), identify barriers to use, and determine what training physiotherapists require.

Background: USI is becoming increasingly common in physiotherapy practice, but it is highly operator-dependent, and there are safety and professional issues regarding its use. Physiotherapists using USI currently lack specific training guidelines. As a result, it is necessary to not only evaluate the context of its clinical use but also to identify the barriers preventing its uptake. However, few regulatory bodies guide the use of USI in physical therapy. The scope of practice for physical therapists in using USI is limited, as well as the opportunities for continuing education.

Methods: A questionnaire was developed based on research literature and guidelines.

Design: Cross-sectional observational design utilizing an Internet-based electronic survey.

Results: The majority of respondents were male (N= 111, 73.50%), and the rest were female (N= 40, 26.50%). Most of the respondents said they don't perform USI in clinical practice (N= 99, 65.10%), and they stated that lack of training and lack of ultrasound machines are the main barriers that limit them from using USI (N= 59, 60.80%) and (N= 54, 55.70%).

Conclusions: The participants reported a variety of clinical uses for USI and levels of training. Training and uptake of USI would both be enhanced by more knowledge of its clinical uses and benefits. Barriers preventing physiotherapists from using USI in Saudi Arabia and ways to overcome them are discussed.

Keywords: Ultrasound imaging, Survey, Physiotherapist, Biofeedback, Ultrasound training

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Introduction

Physical therapists apply ultrasound imaging (USI) as a precise and as assistant to physical examination in order to clarify uncertain findings or provide image guidance that improves the success and safety of procedures besides saving time. USI has become more viable as a tool for physiotherapists to augment their practices due to increased research, growth of USI training opportunities, and the development of ultrasound technologies. Only a limited amount of research has formally documented the use of USI by physiotherapists (1-3).

Nowadays, USI is considered a tool for assessing muscle function in physiotherapy research (4-6), and has been used in clinical physiotherapy practice (7, 8). Thus, it has been suggested that USI is used to visualize the deep muscles of the trunk, spine, neck, and pelvic floor (8). In these muscles, USI is being used as a form of assessment and visual biofeedback during re-education of dysfunction (8, 9).

Physiotherapy applications of USI include rehabilitative USI (e.g. assessment of soft tissue morphology and function, biofeedback, etc.) (7, 10, 11); diagnostic USI (e.g. assessment of injury, disease, etc.) (10, 12); interventional USI (e.g. guidance of needles, apart from the well-established use of USI in musculoskeletal and sports physiotherapy (13, 14). Other uses are emerging in areas such as women's (15) and men's (16) pelvic floor health, and cardiorespiratory (17).

Although these studies showed interesting conclusions related to the uses of USI, they did not show any of the barriers preventing physiotherapists from using USI or the fields of practice for physiotherapists to use USI. It is highly required to understand the obstacles preventing physiotherapists from using USI, as this knowledge would provide means to overcome them. These barriers include the lack of ultrasound equipment and training (18).

In addition to a lack of regulatory oversight, surveys conducted in the UK (2), Australia (1) and New Zealand (3) revealed that there is no internationally accepted program for physical therapists training in USI. However, clear and consistent guidance from regulatory and professional associations could assist in reducing these gaps

In KSA, the number of physical therapists using USI is unclear. There is a need for training courses for physiotherapists to use USI since how it is being used is what should be investigated.

Objectives

The purpose of this study is to evaluate the use of USI by physiotherapists, identify barriers to use, and determine what training physiotherapists need.

Materials and Methods

This study is a cross-sectional observational design using an internet-based survey for Saudi Arabian registered physiotherapists. As reported in previous surveys (1, 2), a group of experts in the field of USI was gathered to provide feedback and guidance for the current survey.

Data Collection:

The final survey was hosted on the Internet-based survey site, Survey-Monkey, which enabled secure and anonymous survey participation (including consent to participate) and anonymous data collection.

Data Analysis:

Data was exported from Survey-Monkey and analyzed using the Statistical Package for the Social Sciences software (SPSS)(19). Depending on the number of valid responses per item, closed and multiple-choice questions were presented as frequencies and percentages. The frequencies and percentages of valid responses were calculated for each category of open-ended questions based on responses that were similar.

Results:

Analysis Interpretation

1. Demographical

Among the respondents, 111 (63.5%) are males and 40 (26.5%) are females. Approximately 75.20 percent of respondents (N= 112, 75.20%) are studying for a bachelor's degree, according to the descriptive statistics. In contrast, 17.40% of students are pursuing master's degrees, 4.70% diplomas, and 2.70% Ph.D. programs. In the survey, musculoskeletal and sports

physiotherapy was reported by 81% of respondents (N= 111). Among the other respondents are 5.10 % from the neurological physiotherapy profession, 3.60 % from the pediatric physiotherapy profession, and 2.20 % from the cardiopulmonary physiotherapy profession. Based on descriptive statistics, 38.00% of respondents have experience of 1 to 5 years. Likewise, 26.00% of respondents have 11 to 20 years of experience, 24.70% have 16 to 10 years of experience, and 11.30% have more than 20 years of experience as shown in table below:

Gender	Frequency	Percentage
Male	111	73.50%
Female	40	26.50%
Degree		
Bachelor	112	75.20%
Master	26	17.40%
Diploma	7	4.70%
PhD	4	2.70%
Other	0	0.00%
Profession		
Musculoskeletal and Sports Physiotherapy	111	81.00%
Neurological Physiotherapy	7	5.10%
Pediatric Physiotherapy	5	3.60%
Cardiopulmonary Physiotherapy	3	2.20%
Other	11	8.00%
Years of Experience		
1 to 5 years	57	38.00%
11 to 20 years	39	26.00%
6 to 10 years	37	24.70%
More than 20 Years	17	11.30%

2. Uses of Ultrasound

There were 99 respondents who claimed not to use USI in their clinical practices (65.10%), and 53 others who recognized it was used (34.90%). About 86.90% of respondents said they were interested in using USI, while 13.10% said they weren't As shown in the table below.

Do you use musculoskeletal ultrasound imaging in clinical practice?	Frequency	Percentage
No	99	65.10%
Yes	53	34.90%
Do you have an interest in using musculoskeletal ultrasound imaging?		
Yes	86	86.90%
No	13	13.10%

3. Barriers

The following table shows the results that most of the respondents said that lack of training and lack of ultrasound machines are the main barriers that limit the therapist from using USI (N= 59, 60.80%) and (N= 54, 55.70%). On the other hand, fewer respondents complained that their organization's policy doesn't permit them to use it (N= 17, 17.50%).

What are the barriers that limit you from using musculoskeletal Ultrasound imaging?	Frequency	Percentage
Lack of training	59	60.80%
Lack of Ultrasound Machine	54	55.70%
My organization's Policy doesn't permit its use	17	17.50%
No time to practice	11	11.30%
I have no interest	8	8.20%
Other	2	2.10%

4. Training

The majority of respondents denied that they had trained to use USI (N=96, 63.60%) and the rest of the respondents agreed that they had trained to use it (N=55, 36.40%). The majority of the respondents said that lack of professional training is the main reason why they didn't get the training (N= 116, 79.50%), and 30.10% of respondents said that the high cost of the training programs is another reason (N= 44, 30.10%) as shown in table below:

Have you trained to use musculoskeletal ultrasound imaging?	Frequency	Percentage
No	96	63.60%
Yes	55	36.40%
Why did not you get the training?		
Lack of the professional training	116	79.50%
High cost of the training programs	44	30.10%
Other	10	6.80%

5. Awareness

Help in diagnosis is the most common application of USI in physiotherapy clinics (N= 125, 85.60%). Additionally, to assess progress and evaluate soft tissue injuries, nearly an equal number of physiotherapy clinics use USI (N= 94, 64.40%) and (N= 91, 62.30%). According to respondents, biofeedback and measurement tools in research account for nearly equal proportions of USI use in physiotherapy clinics (N= 58, 39.70%) and (N= 49, 33.60%) as shown in table below:

What are the uses of musculoskeletal ultrasound imaging in physiotherapy clinics?	Frequency	Percentage
Help in diagnosis	125	85.60%
To evaluate the progress	94	64.40%
Evaluate soft tissue injuries	91	62.30%
Biofeedback	58	39.70%
Measurement tools in research	49	33.60%
Other	4	2.70%

Discussion

This study represents the use of diagnostic ultrasound by physiotherapists in Saudi Arabia. There were 151 respondents, and 111 of them were male (73.5%) and 40 were female (26.5%). It could be argued that the availability and use of physiotherapy

equipment indicate their popularity in clinical practice.

Most of the respondents said they don't use USI in clinical practice (N= 99, 65.10%) and the rest all agreed that they use USI in clinical practice (N= 53, 34.90%). This proportion of users is substantially higher than an Australian study by (1), which reported 12% of their 664 respondents as users of USI. In this study, (1) used USI over a period of time that represents an increase in physiotherapists' use of the procedure over the course of 14 years. Physiotherapy's General Scope of Practice is designed to be broad and does not include (or exclude) specific therapies, techniques, or assessment tools (3).

It is the responsibility of the physiotherapist to demonstrate competence in this field of practice through "relevant and appropriate education and training specifically relating to that field", as stated in the PBNZ's position statement 'Practicing in a Defined Field' (3). This uncertainty is likely to persist because USI is an emerging tool for physiotherapists and its application to physiotherapy is still evolving.

Most respondents stated that lack of training and lack of ultrasound machines are the main barriers that limit them from using USI (N= 59, 60.80%) and (N=54, 55.70%). In addition, a small part stated that the organization's policy does not permit its use (N= 17, 17.50%). The lack of USI training was a significant barrier, as there are limited USI training opportunities in Saudi Arabia. The generalist courses aimed at training sonographers are not targeted at physiotherapists (3).

In addition to a lack of ultrasound equipment, another major barrier was believed to be the high cost of ultrasound equipment. USI may also be a barrier because some participants are not aware of its clinical benefits and uses, as evidenced by some participants' confusion regarding its scope of practice (3). One study suggested that this barrier could be overcome through the provision of guidelines for clinical use and benefit, information about the clinical benefits of USI and how these can add clinical value, and improved research evidence to support the use of USI. The responsibility, therefore, falls upon researchers and clinicians using USI to ensure that the benefit of USI for physiotherapists, along with an accurate

representation of scopes of practice, are disseminated appropriately (3). In light of this, it is essential to remove barriers to facilitate the development of USI in the profession of physiotherapy.

Most of the respondents denied that they had been trained to use USI (N=96, 63.60%) and the rest agreed that they had been trained to use USI (N=55, 36.40%). In order to limit the possibility of diagnostic or therapeutic errors, physiotherapists using USI should be well-trained (both in terms of operation and interpretation) (1, 10, 11, 18).

In terms of USI training for physiotherapists, it needs to be led by experts in the field and designed specifically for the needs of physiotherapists. Even though it is agreed that guidelines should be implemented to direct training and competence (10-12, 20), USI can be used by physiotherapists if they meet certain thresholds and receive adequate training. This issue has not been resolved to date and provides active debate within the physiotherapy USI community (3).

Biofeedback and measurement tool in research has almost equal part of the uses of USI in physiotherapy clinics (N=58, 39.70%) and (N=49, 33.60%) as answered by the respondents. The majority of respondents used USI for biofeedback, yet it is not known if ultrasound biofeedback influences treatment outcomes (7, 14). However, as other forms of biofeedback have been shown to improve outcomes (21), this may be a useful area for future research on ultrasound imaging (10, 22).

A common theme that emerged from the open questions was that USI is very operator-dependent (10, 23-25) and this was perceived as a 'pitfall' and may support the need for structured and on-going training.

Limitation:

Certain limitations of this study need to be acknowledged. As our sample study covered only the government physical therapy section, it might not be generalized to the other sectors in the Kingdom. Because of the nature of this study, we used a convenient sample instead of a random sample.

Recommendation:

Future efforts should focus on developing international standards for self-governance of USI use by physical therapists and ensuring that training and practice standards are identified, reached, and maintained. Physical therapists, among other professionals, need to be exposed to the use of USI in order to avoid inaccurate assumptions about the professional violation and to foster an understanding of the unique applications of USI to physical therapy practice. Last but not least, physical therapists must continue to demonstrate that USI enhances the quality, cost-effectiveness, and efficacy of physical therapy management.

Conclusion

A structured framework to train physiotherapists in USI that is similar to those for other professions is needed since there are relatively few formal training courses specifically designed for physiotherapists.

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