

Perceived Confidence to Interpret Diagnostic Imaging: The Bahamian Physiotherapists' Perspective

E Cato¹, SKP Williams²

ABSTRACT

Objective: This study explored Bahamian physiotherapists' perception of the usefulness of radiologic imaging in physiotherapy practice and to evaluate their self-reported level of confidence in viewing and interpreting these images. Associations between academic qualification, sector of practice and confidence were also examined.

Methods: Ethical approval was granted by UHWI/UWI/FMS Ethics Committee and the local hospitals in Nassau, Bahamas. Practicing physiotherapists were invited to participate. Physiotherapy interns, retired physiotherapists and persons designated as physiotherapy assistants/aids were excluded. Only physiotherapists who gave consent entered the study.

Results: There was a 75% response rate. Most respondents held the Bachelor of Science in physiotherapy as their highest academic qualification. Respondents all agreed that it is essential for physiotherapists to know how to view and interpret medical imaging. The majority of them reported confidence in interpreting plain x-rays (97%, n=29). Those with postgraduate qualifications were likely to report greater confidence. Those in private practice were more likely to report confidence with CT scans, MRI, US and bone scans while those in public practice were most likely to be more confident with X-rays. Most respondents expressed a need for more training in the viewing and interpretation of neurological imaging (86.7%, n=26), ultrasound (50%, n=15), magnetic resonance imaging (63.3%, n=19) and CT scan (43.3%, n=13).

Conclusion: Overall, the results demonstrated that physiotherapists in the Bahamas perceived it essential for physiotherapist to know how to view and interpret medical imaging and that confidence to interpret such imaging varied. These physiotherapists expressed the need for further training.

Keywords: Diagnostic imaging, physiotherapists, The Bahamas

From: ¹Physiotherapy clinic in Nassau, Bahamas. ²Section of Physical Therapy, Faculty of Medical Sciences, University of the West Indies, Mona, Kingston 7, Jamaica, W. I.

Correspondence: Dr S Williams, Section of Physical Therapy, Faculty of Medical Sciences, University of the West Indies (Mona Campus), Kingston, Jamaica, W.I. E-mail: sonja.williams@uwimona.edu.jm

INTRODUCTION

Fifty-five physiotherapists are licensed to practice in the Bahamas. They manage orthopaedic, cardiopulmonary and neurological patients with conditions for which the specific pathology can be demonstrated on diagnostic images. Such information augments the physiotherapy findings from patients' physical examinations (1) and support physiotherapy clinical decision making. It is therefore beneficial for them to have the confidence and knowledge to recognize radiographic patterns of injury/disease that they commonly encountered in their clinical practice. The accuracy to interpret these images is dependent on an acute visual perception to identify the specific characteristics associated with a given disease, so one must understand that a medical diagnostic image only offers a presumptive diagnosis. Errors can occur and are attributed to an oversight of abnormalities and/or the misinterpretation of what of the image (2). Lee, Nagy, Weaver, and Newman-Toker (3) demonstrated such error by evaluating radiologists. They found that the retrospective error of 30% and a real-time error in daily practice of 3 – 5%. Much of the research related to physiotherapists' use of medical imaging is focused on the benefits of being able to order diagnostic imaging in a direct access practice setting (4,5). Information relating to the current topic under investigation is scarce as only three studies were found. Two of the three articles, subjectively evaluated perception of usefulness, and one objectively evaluated physiotherapist's skill level.

Though perceptions are aligned to personal feelings and may not be completely influenced by actual knowledge, it is important to investigate the construct as it does influence behavior. Little and Lazaro (6) examined the perception of 120 Californian (USA) physiotherapists on the importance and utility of diagnostic imaging in physiotherapy practice.

They found that these physiotherapists considered the use of such imaging useful to their practice, however not all of them expressed confidence to view and interpret such images. The authors therefore surmised that further training aimed at improving physiotherapists' competence and confidence was needed. Littlejohn, Nahna, Newland and Robins (4) also identified this need for further training. In exploring what protocols and/or procedures exist for radiological imaging referral (X-rays and ultrasound) in New Zealand and if physiotherapists in that country knew and use them, they were also able to discern the physiotherapists' need for training on the viewing and interpretation of medical diagnostic images. Bello, Ofori, Alabi and Adjei (7) did not rely on self-reported statement of competency or expressed felt need for training. They quantified Ghanaian physiotherapists' ability to view and interpret medical imaging by comparing their ability (level of agreement) to interpret of plain x-rays for patients with low back pain to a gold standard score of a radiologist. Aptitude was scored on a scale of 0 – 24. The physiotherapists' mean score was 12.7 ± 2.6 points compared to the gold standard score of 24. Most of the physiotherapists (85.4%, n=35) gained scores between 9 – 16 points while a minority gained scores between 0 – 8 (9.8%, n=4) and 17 – 24 (4.9%, n = 2). This distribution of scores suggested that most Ghanaian physiotherapists do not have adequate skills to view and interpret medical imaging and implied that acquiring such skills may not be out of the reach of these physiotherapists. After all, one physiotherapist (of 41) got a score of 17 and another achieved a full score of 24. This study also revealed that physiotherapists' scores were statistically significantly associated with their academic qualification ($p = 0.006$) but not with continuing education courses (related to the topic), suggesting that training received in academic programmes was more beneficial for sustained skill development rather than skills picked up in continuing education courses. These three studies, though using different methodologies and

sampling physiotherapists from different countries, have all demonstrated the need for training to improve physiotherapists' level of proficiency.

Based on anecdotal observation it has been noted that some Bahamian physiotherapists prefer to read the radiologists report rather than viewing and interpreting the medical image themselves. Is such preference/behaviour due to a perceived lack of knowledge, skill and confidence on the part of these physiotherapists? As physiotherapists should utilize tools that optimize the effectiveness of their patient management skill set, they should have the confidence and knowledge to enable them to recognize radiographic patterns of injury commonly encountered in their clinical practice. This study therefore sought to explore Bahamian physiotherapists' perception of the usefulness of radiologic imaging in physiotherapy practice and to evaluate their perceived level of confidence in using such images in the management of their patients. It also sought to evaluate associations between academic qualifications, sector of practice and the physiotherapists' perceived confidence.

METHODOLOGY

This cross-sectional study received ethical approval from the UHWI/FMS/UWI Ethics Committee, UWI Mona, in November 2014. Permission to access physiotherapist working in the public sector was granted by the local hospitals in the Bahamas. Physiotherapists from private and public sector were selected based on the inclusion and exclusion criteria. Those registered to practice in the Bahamas and who gave consent were recruited into the study but assistants/aids, interns and retired physiotherapists were excluded. The researcher met with public sector physiotherapists within the hospitals, and briefed them on the procedure of the study. Those who

fulfilled the inclusion and exclusion criteria were invited to participate and asked to sign consent the form. They then completed the questionnaire (maximum 10 minutes). Participants needing more time were allowed to take home the questionnaire and were reminded by phone to complete and return same. Completed questionnaires were collected by a research assistant. Physiotherapists in private practice were identified from the local telephone directory, were individually contacted by telephone, briefed about the study and invited to participate. The questionnaire was sent to them via hand delivery and e-mail. Those receiving e-mails were not required to sign a consent form, as by virtue of opening the e-mail and responding to the questionnaire, they gave consent to participate in the study.

Data collection spanned eight (8) weeks between February to April, 2015. The questionnaire used to collect the data consisted of 19 questions. It was structured based on the objectives of the study and pilot tested. As the population of physiotherapists in the Bahamas is small, the questionnaire was pilot tested on Jamaican physiotherapists as the latter and former groups have similar academic backgrounds and cultural heritage. There were minimal risks associated with this study and ethical considerations were exercised to ensure anonymity and confidentiality.

Data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 16. Descriptive statistics (frequencies, percentages and cross tabulations) were used in the analysis of the data. The small number of participants ($n = 30$) prevented the use of inferential statistics in the analysis of the associations as the subgroup numbers, in some instances, were too small to enter into such analysis (chi-square).

RESULTS

Forty physiotherapists entered the study but only 30 participated, representing a 75% response rate. The majority (90%, n = 27) were female with years of service ranging from 0 – 42 years, with a mean of 11.7 years (\pm 9.4) and a median and mode of 10 years. Regarding employment, most (57%,n=17) were full time employed in public sector hospitals with the remaining working full time in the private sector. They ranged in age from 25 – 66 years with the majority (77%, n = 23) being within the age group of 25 to 39 years. The mean age was 36.6 years (\pm 10.8) with a median age 34.5 years. Regarding academic qualification, the majority (63%, n = 19) held an undergraduate degree or diploma with a minority (36.7%, (n = 11) holding postgraduate degree(s) (Masters (10%, n =3) and Doctor of Physiotherapy (27%, n = 8)) (Table 1). Most participants (57%, n=17) reported that the main source of their knowledge and the development of their skill came from on the job experience and continuing education courses (Table 1).

Table 1: Distribution of Demographic Characteristics

Variable	n=30	%
Gender		
Male	3	10%
Female	27	90%
Sector of practice		
Public	17	57%
Private Practice	13	43%
Academic Qualification		
Undergraduate (Diploma, BSc)	19	63.3%
Post-graduate (Masters, DPT)	11	36.7%
Main Source of Knowledge on Medical Imaging		
Academic programmes (under or postgraduate)	13	43%
On the job exposure/continuing education courses	17	57%

In terms of the actual viewing and interpretation of medical imaging the majority of the participants (80%, n = 24) reported viewing medical image and also reading the radiologist report while the others (20%, n = 6) reported that they only read the radiologist report. All participants agreed that it was essential for physiotherapists to know how to view and interpret medical imaging. The majority of them (80 %, n=24) stated that the information provided by such images facilitated clinical decision making related to physical therapy diagnosis and patient management. A minority (20%, n=6) limited the usefulness of these images to only the development of the physiotherapy diagnosis. On a scale of 1 – 3 (most likely – least likely), the participants were asked to rank the frequency of their use of medical imaging in orthopaedic, cardiopulmonary and neurological patient cases. Eight-seven percent (n = 26) ranked use in orthopaedic cases as number one, 73.3% (n=22) ranked use in cardiopulmonary as intermediate and use in neurology as number three. Based on this ranking, it is evident that these participants were more likely to consult medical imaging in orthopaedic cases followed by cardiopulmonary cases and were least likely to consult such images for neurological patients. Participants felt most comfortable to view and interpret plain X-rays and least confident to view and interpret a bone scan (Figure 1).

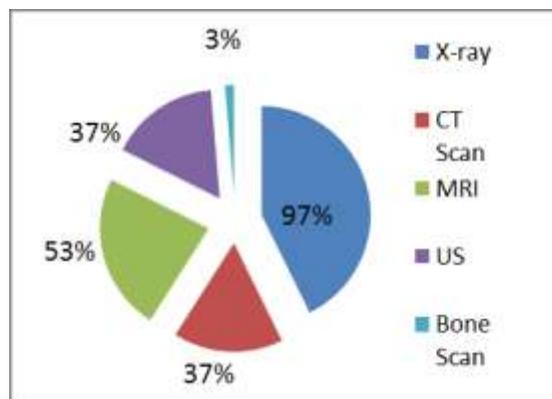


Fig 1: Distribution of Perceived Confidence to View and Interpret Medical Imaging

When examining the cross-tabulation between academic qualification and participants' perceived confidence to view and interpret medical imaging, there was a tendency for participants with postgraduate degrees to report greater confidence than those with an undergraduate degree or diploma (Table 2). Statistical significance could not be assessed as some subgroups had values less than five (5). It was also noted that participants from private practice were more likely to report being confident to view and interpret the CT scan, ultrasound, MRI and bone scan while those from public practice were more likely to report being confident to view and interpret plain X-rays (Table 3). Again, statistical significance could not be assessed as some subgroups had values less than five (5).

Table 2: Association between academic qualification and perceived confidence to view and interpret medical imaging

Medical Image	Physiotherapists' Confidence	
	Undergraduate degree or Diploma n=19	Postgraduate degree n=11
X – ray		
Confident	18 (95%)	11 (100%)
Not confident	1 (5%)	0 (0%)
CT Scan		
Confident	5 (26%)	5 (46%)
Not confident	14 (74%)	6 (55%)
MRI		
Confident	7 (37%)	10 (91%)
Not confident	12 (63%)	1 (1%)
US		
Confident	6 (32%)	7 (64%)

Not confident	13 (63%)	4 (36%)
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Table 3: Association between sector of practice and perceived confidence to view and interpret medical imaging

Medical Image	Physiotherapists' Confidence	
	Public Sector n=17	Private Sector n=13
X – ray		
Confident	16 (94%)	8 (62%)
Not confident	1 (6%)	5 (39%)
CT Scan		
Confident	6 (35%)	5 (39%)
Not confident	11 (65%)	8 (62%)
MRI		
Confident	6 (35%)	7 (54%)
Not confident	11 (65%)	6 (46%)
US		
Confident	6 (35%)	11 (85%)
Not confident	11 (65%)	2 (15%)
Bone Scan		
Confident	0 (0%)	2 (15%)
Not confident	17 (100%)	11 (85%)

Regarding felt need for training, 87% (n=26) of the participants expressed the need for training in the interpretation of imaging related to neurological cases, followed by 60% (n=18) who expressed the need for training for imaging related to cardiopulmonary cases. The least need was expressed for orthopaedic cases (16.7%, n=5). Specifically related to the type of imaging, the greatest need for training was expressed for the imaging techniques of US, MRI, CT scan and bone scan.

DISCUSSION

With the evolving role of the physiotherapist, it is increasingly being recognized that the utilization of information from medical imaging, augments the findings from the physiotherapy physical examination of the patient. This fact was acknowledged generally by the Bahamian physiotherapists in this study, the majority of whom also felt that such information supported the overall management of the patient. When asked to reflect on their competency to view and interpret medical imaging most expressed the felt need for training as they perceived their level of skill as insufficient to allow them to be efficient in this activity. We could therefore surmise that the Bahamian physiotherapists value the need to improve the accuracy of their skill as they consider the use of medical imaging as an integral part of their patient management. The fact that this finding of physiotherapist perceived insufficient ability was also common to the studies cited in the introduction of this study (4, 6, 7) may be suggestive of a greater desire by physiotherapist worldwide to “step up their game”. The fact the many of the Bahamian physiotherapists gained most of their skill on the job and that many of them supported their viewing and interpreting of these medical images by reading the radiologist’s report, suggests a level of interest to learn and demonstrates a sense of professional responsibility.

When academic qualification was cross-tabulated with confidence to view imaging, the physiotherapists with post graduate degrees were more likely to report confidence for all the medical images reported in this study. This finding was also common to the study by Bello, Fore, Alibi and Adjoin (7) and was expected as post-graduate programmes provide greater training in radiology. Differences in perceived skill, was also note between private and public practitioners. Those from private practice were more likely to report confidence with CT scan, ultrasound, MRI and bone scan while those from public practice were more likely to report being confident with plain X-rays. As a number of these physiotherapists develop their skill on the job,

these results may just be a reflection of the availability of the types of imaging in the public and private facilities and physiotherapists exposure to these imaging. Plain film X-rays (radiographs) is the most common imaging techniques used for patients that get referred to physiotherapy due to its availability and affordability, and will be done most often in the public facilities. Patient accessing private care may be more likely to have the other types of imaging.

Overall, this study has provided some valuable insights into the utilization of diagnostic imaging by Bahamian physiotherapists and it can be concluded that they value the use of such imaging in their practice. This study has showed that the physiotherapists' perception of their accuracy in the interpretation of medical imaging varied, and that there is a perceived need for more training so as to improve their knowledge and confidence in this regard.

The inability to statistically analyze the data due to small sub-group numbers is a limitation. Therefore a more comprehensive study using a larger sample size is recommended. As persons in the Caribbean share a similar education system and heritage, such a sample size could be achieved by combining the physiotherapists from the English speaking Caribbean together as one population. Such a study would facilitate the statistical analysis of the associations mentioned in the current study and could also facilitate studies to quantify the level of accuracy of the physiotherapists' interpretation of medical imaging. Such findings could prove useful in the development of the physiotherapy service in the Caribbean and could also guide the objectives of training opportunities so that they meet the needs of the physiotherapy population within the Caribbean.

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