

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

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ABSTRACT

Objective: This study explored Bahamian physiotherapists' perception of the usefulness of radiologic imaging in physiotherapy practice and evaluated their self-reported level of confidence in viewing and interpreting these images. The associations among their academic qualifications, sector of practice and confidence were also examined.

Methods: Ethical approval was granted by the University Hospital of the West Indies (UWI/FMS) Ethics Committee and the local hospitals in Nassau, Bahamas. Practicing physiotherapists were invited to participate. Physiotherapy interns, retired physiotherapists and workers designated as physiotherapy assistants/aids were excluded. Only the physiotherapists who gave their consent participated in the study.

Results: There was a 75% response rate. Most of the respondents held the Bachelor of Science degree in physiotherapy as their highest academic qualification. The respondents 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 computed tomography (CT) scans, magnetic resonance imaging (MRI), ultrasound (US), and bone scans while those in public practice were most likely to be more confident with X-rays. Most of the respondents expressed a need for more training in the viewing and interpretations of neurological imaging (86.7%, $n = 26$), US (50%, $n = 15$), MRI (63.3%, $n = 19$), and CT scans (43.3%, $n = 13$).

Conclusion: Overall, the results demonstrated that physiotherapists in the Bahamas perceived it essential for physiotherapists to know how to view and interpret medical imaging and that their confidence in interpreting such imaging varied. The 30 physiotherapists expressed the need for further training of physiotherapists.

Keywords: Diagnostic imaging, physiotherapists, The Bahamas.

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 the patients' physical examinations (1) and supports physiotherapy clinical decision-making. It is therefore beneficial for them to have the confidence and

knowledge to recognize radiographic patterns of injuries/diseases that they commonly encountered in their clinical practice. Physiotherapists' accuracy in interpreting 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 misinterpretations of the image

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(2). Lee *et al* (3) demonstrated such errors by evaluating radiologists. They found that the retrospective error is 30% and a real-time error in daily practice is 3% to 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 physiotherapists' use of imaging, perception of usefulness, and one objectively evaluated physiotherapists' skill level.

Although people's perceptions are aligned to their personal feelings and may not be completely influenced by their actual knowledge, it is important to investigate the construct as they influence people's behaviour. Little and Lazaro (6) examined 120 Californian (USA) physiotherapists' perceptions on the importance and the utility of diagnostic imaging in physiotherapy practice. They found that 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 *et al* (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 interpretations of medical diagnostic images. Bello *et al* (7) did not rely on self-reported statement of competence 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. Their 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 and 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 suggests that most Ghanaian physiotherapists do not have adequate skills to view and interpret medical imaging and implies that acquiring such skills may not be out of the reach of these physiotherapists. After all, one physiotherapist (out of 41) got a score of 17 and another achieved a full score of 24. This study also revealed that the 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 the 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' reports rather than viewing and interpreting the medical images 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 the 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 injuries 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 the associations among their academic qualifications, sector of practice and the physiotherapists' perceived confidence.

SUBJECTS AND METHODS

This cross-sectional study received ethical approval from the UHWI/FMS/UWI Ethics Committee, UWI Mona, in November 2014. The permission to access the physiotherapists working in the public sector was granted by the local hospitals in the Bahamas. The physiotherapists from private and public sectors 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 in 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 the consent form. They then completed the questionnaire (maximum 10 minutes). The participants needing more time were allowed to take home the questionnaire and were reminded by phone to complete and return them. The completed copies of the questionnaire were

collected by a research assistant. The physiotherapists in private practice who 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 email. Those receiving emails were not required to sign a consent form, as by virtue of opening the email and responding to the questionnaire, they gave consent to participate in the study.

The data collection spanned 8 weeks between February and 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 the participants' anonymity and confidentiality.

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

RESULTS

A total of 40 physiotherapists entered the study but only 30 participated, representing a 75% response rate. The majority (90%, $n = 27$) were females with years of service ranging from 0 to 42 years, with a mean of 11.7 years (± 9.4) and a median and mode of 10 years. Regarding employment, most (57%, $n = 17$) were employed full time in public sector hospitals, with the remaining working full time in the private sector. They ranged in age from 25 to 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 (± 10.8) with a median age of 34.5 years. Regarding their academic qualifications, 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 of the participants (57%, $n = 17$) reported that the main source of their knowledge and the development of their skills

came from 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
Postgraduate (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 interpretations of medical imaging, the majority of the participants (80%, $n = 24$) reported viewing medical images and also reading the radiologists' reports, while the others (20%, $n = 6$) reported that they only read the radiologists' reports. All the 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 their clinical decision-making related to physical therapy diagnoses and patients' management. A minority (20%, $n = 6$) limited the usefulness of these images to only the development of the physiotherapy diagnoses. On a scale of 1–3 (most likely to 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 (most frequently used) while a smaller proportion (73.3%, $n = 22$) ranked use in cardiopulmonary cases as number two, while use in neurologic cases was ranked as number three (least likely used). 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. The participants felt most comfortable in viewing and interpreting plain X-rays and least confident in viewing and interpreting bone scans (Figure).

When examining the cross-tabulation between the academic qualification and the participants' perceived confidence in viewing and interpreting medical imaging, there was a tendency for the participants with

postgraduate degrees to report greater confidence than those with undergraduate degrees or diploma (Table 2). Statistical significance could not be assessed as some subgroups had values less than 5. It was also noted that the participants from private practice were more likely to report being confident in viewing and interpreting the computed tomography (CT) scans, ultrasound, magnetic resonance imaging (MRI) and bone scan, while those from public practice were more likely to report being confident in viewing and interpreting plain X-rays (Table 3). Again, statistical significance could not be assessed as some subgroups had values less than 5.

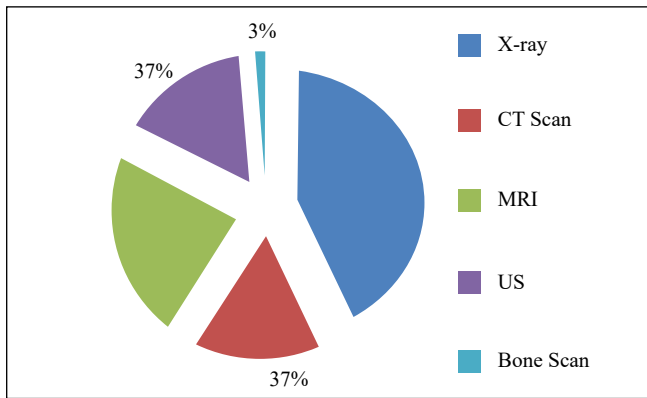


Figure: Distribution of perceived confidence in viewing and interpreting medical imaging.

Table 2: Association between academic qualification and perceived confidence in viewing and interpreting 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%)

CT = computed tomography; MRI = magnetic resonance imaging; US = ultrasound.

Regarding their felt need for training, 87% (n = 26) of the participants expressed the need for training in the interpretations 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 scans, and bone scans.

Table 3: Association between sector of practice and perceived confidence in viewing and interpreting 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%)

CT = computed tomography; MRI = magnetic resonance imaging; US = ultrasound.

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 patients. 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 patients. When asked to reflect on their competence in viewing and interpreting medical imaging, most expressed the 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 patients' management. The fact that this finding of the physiotherapists' perceived insufficient ability was also common in the studies cited in the introduction of this study (4, 6, 7) may be suggestive of a greater desire by

physiotherapists worldwide to 'step up their game'. The fact that many of the Bahamian physiotherapists gained most of their skills on the job and that many of them supported their viewing and interpreting of these medical images by reading the radiologists' reports suggests a high level interest among them to learn and demonstrates a sense of their professional responsibility.

When academic qualification was cross-tabulated with confidence in viewing imaging, the physiotherapists with postgraduate degrees were more likely to report confidence for all the medical images reported in this study. This finding was also true of the study by Bello *et al* (7) and was expected as postgraduate programmes provide greater training in radiology. The differences in perceived skills were also noted in the private and public practitioners. Those from private practice were more likely to report confidence in viewing CT scans, ultrasound, MRI, and bone scans, while those from public practice were more likely to report being confident in viewing plain X-rays. As a number of these physiotherapists develop their skills 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 the physiotherapists' exposure to these imaging. Plain film X-rays (radiographs) is one of the most common imaging techniques used for patients who are referred to physiotherapy due to its availability and affordability, and will be done most often in the public facilities. The patients 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 interpretations 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 limitation of the study is the inability to statistically analyse the data due to small subgroup numbers. Therefore, a more comprehensive study using a larger sample size is recommended. As the people 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 analyses of the associations mentioned in the current study and could also facilitate studies to quantify the level of accuracy of the physiotherapists' interpretations 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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