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An international survey of current physiotherapy practice in diagnosis and knowledge translation of greater trochanteric pain syndrome (GTPS)

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A B S T R A C T

Purpose: To evaluate how physiotherapists across three countries (Australia, New Zealand (NZ) and Ireland) diagnose greater trochanteric pain syndrome (GTPS) using clinical tests and imaging findings, and how physiotherapists update their knowledge regarding GTPS.

Design: Cross-sectional observational study of physiotherapists.

Methods: An online survey was distributed to registered physiotherapists in Australia, NZ and Ireland. Ordinal and nominal data were analysed using frequency counts or mean ranks; medians and interquartile ranges were calculated for numerical data. Comparisons between the three countries were made using Chi-squared analyses for nominal/ordinal data and Kruskal Wallis tests for numerical data. Statistical significance was set at $p < 0.05$.

Results/findings: Valid responses were received from 361 physiotherapists; 61% were female and 79.8% worked in private practice. Most respondents were very confident in diagnosing GTPS (67.9%) and incorporated a range of symptoms and tests, including validated tests, in their diagnosis. However, many physiotherapists were not commonly using some available validated diagnostic tests (e.g. FABER and FADER-R). Approximately 30% of physiotherapists used imaging to inform assessment, with ultrasound being most preferred. Physiotherapists rated hands-on experience as most valuable for updating their knowledge of GTPS, followed by courses.

Conclusion: While most clinicians appear to be using current evidence in their assessment of patients with GTPS, a proportion use suboptimal methods and/or a limited range of diagnostic tests, suggesting that despite their confidence in diagnosis, further knowledge translation may be required. Future research should determine the best methods of facilitating knowledge acquisition and translation of research into practice.

1. Introduction

Greater trochanteric pain syndrome (GTPS), associated with gluteus medius and minimus tendinopathy and trochanteric bursitis (Bird et al., 2001) affects up to 15% of women and 6.6% of men over the age of 40 years (Segal et al., 2007). Pain and tenderness about the greater trochanter are reported during side-lying and weightbearing activities (Grimaldi and Fearon, 2015; Fearon et al., 2013) negatively affecting sleep quality, physical activity, work participation and quality of life (Fearon et al., 2014).

Diagnostic utility studies have shown that a targeted clinical assessment provides a reasonably high level of accuracy in predicting the presence of soft tissue pathologies associated with GTPS (Ganderton et al., 2017; Lequesne et al., 2008; Grimaldi et al., 2017). However, it is not clear how well this information has been implemented in clinical practice. Magnetic resonance imaging (MRI) and ultrasound (US) are commonly used to aid diagnosis of GTPS (Westacott et al., 2011; Woodley et al., 2008). Considering the high rates of positive imaging findings in those without GTPS (Ganderton et al., 2017; Woodley et al., 2008; Docking et al., 2019), the extent to which physiotherapists rely on imaging to reach a diagnosis should be ascertained.

It takes approximately 17 years for health research findings to be adopted into practice (Morris et al., 2011). Although multiple strategies to reduce this gap in an allied health arena have been investigated, mixed results have been reported, with insufficient evidence available to recommend one strategy over another (Scott et al., 2012). Understanding what methods physiotherapists favour to update their knowledge may facilitate translation of research findings into clinical practice (Scott et al., 2012). Teaching philosophy suggests that a mixture of situational learning, constructivism and humanistic approaches, along with assessment is likely to drive learning and thus, provide robust knowledge translation (Hunt and Chambers, 2012). To facilitate

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this, it would be useful to understand the level of confidence that physiotherapists have in making a diagnosis of GTPS, and what approach to knowledge acquisition is favoured by physiotherapists.

2. Aims and objectives

This study aimed to: (i) Understand which diagnostic criteria physiotherapists in Australia, New Zealand (NZ) and Ireland use to determine the presence of GTPS; (ii) Report the level of confidence those physiotherapists have in determining the presence of GTPS; (iii) Determine what strategies physiotherapists deem most important in developing their knowledge of managing patients with GTPS; and (iv) Compare responses across the three countries.

3. Methods

3.1. Study design

This cross-sectional observational study utilised an originally-designed, anonymous, online survey administered to registered physiotherapists in three countries.

3.2. Ethical considerations

Approval was provided by the following research ethics committees: University of Canberra, Australia (REC1346b); University of Otago, NZ (D17/062); and the Royal College of Surgeons in Ireland (REC1346). Participant information was provided at the beginning of the survey and informed consent assumed if participants continued past the first question.

3.3. Survey development

The survey was designed by Australian, NZ and Irish physiotherapists with research and extensive clinical experience with GTPS (HF, AG, SW, LO, AF). It was part of a larger survey on the physiotherapy management of GTPS, results of which are published elsewhere (French et al., 2019), with three of the 51 questions focused on diagnosis and knowledge acquisition of GTPS (Appendix A). Following pilot testing of the survey on 16 physiotherapists, minor amendments were made to skip logic functions and wording to improve question clarity and flow.

3.4. Study sample

Registered physiotherapists in Australia, NZ or Ireland who were members of their respective national professional bodies and worked primarily in musculoskeletal or sports settings were included. Potential participants were invited to take part in the survey via invitations from, or advertising through, appropriate clinical interest groups of the respective professional organisations.

Based on membership numbers the target population was estimated at 4200 physiotherapists (Australia, 2750; NZ, 750; Ireland, 700). The required sample size, based on a 5% margin of error, was estimated as 352 (https://www.surveysystem.com/sscalc.htm). All relevant clinical interest group members were sampled to allow for non-response, anticipating that not all therapists working in these settings manage people with GTPS.

3.5. Data collection and analyses

Data were collected centrally via SurveyMonkey an online survey tool; SPSS v24 (IBM Corp, Chicago, Illinois, USA) was used for data analysis. Only responses whereby ≥80% of data were complete were included. Most data were nominal or ordinal. Where respondents were asked to rank items in order of importance, with 1 being most important, mean ranks were calculated; lower ranks indicating greater importance. Data were analysed descriptively, using medians and interquartile ranges for numerical data and frequency counts for nominal and ordinal data. Comparisons between the countries were made using Chi-squared analyses and Kruskal-Wallis tests. Statistical significance was set at $p < 0.05$.

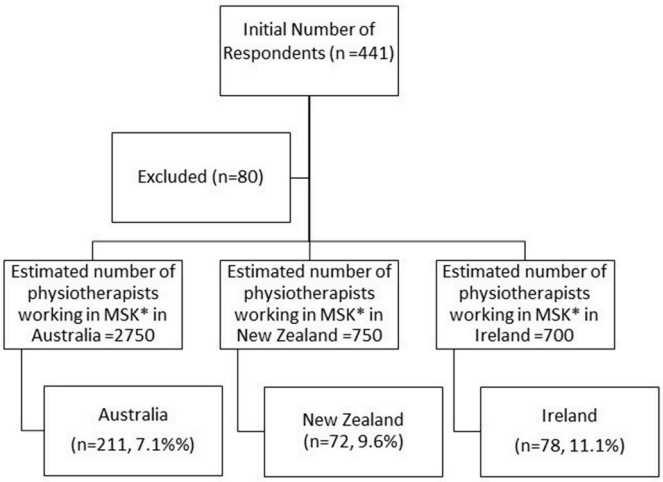

Fig. 1. Flow of participants through the study.

4. Results

4.1. Survey response

Of the 441 respondents who completed the survey, 80 (18.1%) provided no professional or demographic details, resulting in a valid sample of 361 respondents (Fig. 1). As not all questions required an answer, responses did not always total 100%. Where respondents could provide as many responses relevant to them, totals may have been greater than 100%.

4.2. Professional/demographic details

Most respondents were female, with the highest proportion in Ireland (Table 1). Most worked in private practice, with a higher proportion of New Zealanders (84.7%) and Australians (83.6%) in private practice than Irish (64.1%) ($p < 0.001$). Australians were older ($p < 0.001$) and more experienced ($p < 0.001$) than Irish or NZ respondents (Table 1). Most respondents had a Bachelor of Physiotherapy degree and formal postgraduate education, with postgraduate qualifications proportionally lowest amongst Australian respondents ($p = 0.014$). Most physiotherapists (246/361, 68.1%) treated less than five patients with GTPS per month; 103/361 (28.5%) treated between five and 15 and 3.5% (11/361) treated more than 15 patients with GTPS per month. The number of treatment sessions varied between countries ($p < 0.001$). More than six sessions were commonly provided in NZ (31/72, 43.1%) and Australia (55/211, 26.1%), compared with Ireland (7/78, 9%), where five to six sessions was common (35/78, 44%). Private patient financial factors were the biggest limiting factor in all countries (56–67%). Insurance company limits were more important in NZ, and public system wait lists more important in Ireland (Table 1).

4.3. Diagnosis of GTPS

The signs, symptoms and imaging used by physiotherapists to diagnose GTPS are outlined in Table 2. Symptoms such as lateral hip pain (LHP) aggravated by loading, side-lying, palpation of the greater trochanter or gluteal tendons, and pain on the single leg stance test were

Table 1
Professional and demographic profile of respondents (n = 361).

	Australia (n = 211)	New Zealand (n = 72)	Ireland (n = 78)	Total (n = 361)
Age (years) Median (IQR)	43 (23)	39.5 (17)	40 (13)	42 (20)
Experience (years) Median (IQR)	20 (22)	13.5 (14)	16 (14)	18 (19)
Gender, number (%)				
Male	92 (43.6)	24 (33.3)	23 (29.5)	139 (38.5)
Female	119 (56.4)	48 (66.7)	55 (70.5)	222 (61.5)
Work setting and grade, number (%)				
Private practice owner	90 (42.4)	16 (22.2)	34 (43.6)	140 (38.8)
Private practice employee	87 (41.2)	45 (62.5%)	16 (20.5)	148 (41)
Public junior	3 (1.3)	0	8 (10.3)	11 (3)
Public senior	24 (11.4)	8 (11.1)	13 (16.7)	45 (12.5)
Public clinical specialist	6 (2.8)	2 (2.8)	7 (9)	15 (4.1)
Public manager	1 (1.5)	1 (1.4)	0	2 (0.6)
Physiotherapy qualification, number (%)				
Diploma	14 (6.6)	15 (20.8)	8 (10.3)	37 (10.2)
Bachelors	134 (63.5)	42 (58.3)	42 (53.8)	218 (60.4)
Masters	62 (29.4)	12 (16.7)	27 (34.6)	101 (28)
Doctorate	1 (0.5)	3 (4.2)	1 (1.3)	5 (1.4)
Post-graduate education[a], number (%)				
None	95 (45)	23 (31.9)	22 (28.2)	140 (38.7)
Diploma	30 (14)	9 (12.5)	24 (30.8)	63 (17.4)
MSc sports	24 (11.4)	4 (5.5)	4 (5.1)	32 (8.8)
MSc musculoskeletal	40 (19%)	8 (11.1)	25 (32)	73 (20.2)
MSc other	3 (1.4)	4 (5.5)	13 (16.7)	20 (5.5)
PhD	2 (1)	5 (6.9)	4 (5.1)	11 (5.5)
Other	40 (19)	13 (18.1)	19 (24.4)	72 (19.9)
Number of treatments, number (%)				
3 to 4	51 (24.2)	5 (6.9)	29 (37.2)	85 (23.5)
5 to 6	89 (42.2)	33 (45.8)	35 (44)	157 (43.5)
More than 6	55 (26.1)	31 (43.1)	7 (9)	93 (25.8)
Limitations to number of treatments provided, number (%)				
None	56 (26.5)	21 (17)	17 (21.8)	94 (26)
Public system limits	50 (23.6)	13 (18.1)	9 (11.5)	72 (19.9)
Public system wait-lists	14 (6)	5 (6.9)	12 (15.3)	31 (8.5)
Insurance company limits	26 (12.3)	22 (30.5)	7 (8.9)	55 (15.2)
Private patient financial resources	134 (63.5)	48 (66.7)	44 (56.4)	226 (62.6)

MSc, Masters of Science; PhD, Doctor of Philosophy; IQR, interquartile range.
[a] Respondents may have given >1 answer option.

considered most indicative of GTPS. Palpation was not used by 32/361 (8.9%) of respondents, with no inter-country significant difference (p = 0.21). Australian physiotherapists considered imaging in making their diagnosis more than Irish or NZ therapists.

4.4. Confidence in diagnosis

Most respondents reported being very confident in diagnosing GTPS (245/361, 67.9%), with significant differences between countries (p < 0.001) for all comparisons for 'very confident' and 'somewhat confident' responses (Fig. 2).

4.5. Knowledge acquisition of GTPS

Overall, physiotherapists rated hands-on experience (ranked 1st) above course attendance (2nd and 3rd), journals (4th) and conferences (6th). GTPS courses were deemed most important for updating knowledge on GTPS in Australia, compared with physiotherapists in NZ and Ireland who ranked hands-on clinical experience as most important. NZ physiotherapists ranked work in-service training (2nd) higher than Australian (6th) or Irish (7th) physiotherapists (Table 3).

5. Discussion

In this survey, results showed that although most clinicians appear to be using current evidence in their assessment of patients with GTPS, a proportion use a limited range of tests to inform diagnosis of GTPS whilst the majority were very confident in their diagnosis. Different knowledge acquisition methods were used, most commonly hands-on experience and courses.

With respect to diagnosing GTPS, LHP associated with loading or side-lying was deemed more important than a report of LHP alone, in line with current knowledge of tendinopathy (Docking et al., 2013). Greater trochanter and/or gluteal tendon palpation was consistently considered the most essential component of the physical examination. Painful compression of the soft tissues overlying the greater trochanter (Grimaldi and Fearon, 2015) is widely accepted as the primary sign of GTPS (Bird et al., 2001; Fearon et al., 2013; Lequesne et al., 2008). This premise is supported by two recent studies that evaluated various tests used for prediction of gluteal tendon pathology on MRI: palpation had the highest diagnostic accuracy (Grimaldi et al., 2017) and best

Table 2
Symptoms, physical signs and imaging used to confirm diagnosis of GTPS (n = 361).

	Australia (n = 211)	New Zealand (n = 72)	Ireland (n = 78)	Total (n = 361)
	Number (%)	Number (%)	Number (%)	Number (%)
Symptoms				
LHP with loading **	189 (89.6)	67 (93.1)	56 (71.8)	312 (86.4)
LHP with side-lying	185 (87.7)	56 (77.8)	70 (89.7)	311 (86.1)
LHP	137 (64.7)	53 (73.6)	56 (71.8)	246 (68.1)
Physical examination signs				
Palpation greater trochanter	189 (89.6)	60 (83.3)	63 (80.8)	312 (86.4)
Palpation gluteal tendon	169 (80.9)	56 (77.8)	60 (76.9)	285 (78.9)
LHP with single leg stance	148 (70.1)	67 (93.1)	48 (61.5)	262 (72.8)
LHP with resisted hip abduction in neutral	92 (43.6)	46 (63.9)	38 (48.7)	176 (48.7)
LHP with resisted hip abduction in Ober's position	78 (36.9)	23 (31.9)	36 (46.1)	137 (37.9)
LHP with FADER/FADER-R	73 (34.6)	18 (25.0%)	33 (42.3)	124 (34.3)
LHP with external derotation test	55 (26.1)	24 (33.3%)	28 (35.9)	107 (29.6)
LHP with Obers	61 (28.9)	24 (33.3)	15 (19.2)	100 (27.7)
LHP with FABER*	48 (22.7)	15 (20.8)	30 (38.4)	93 (25.7)
Imaging				
US changes**	96 (45.5)	21 (29.2)	15 (19.2)	132 (36.5)
MRI changes	66 (31.3)	17 (23.6)	24 (30.8)	107 (29.6)
Normal X-ray	44 (20.9)	21 (29.2)	24 (30.8)	89 (24.6)

*p < 0.05; **p < 0.001.
LHP, lateral hip pain; FADER, flexion, adduction, external rotation; FADER-R, flexion, adduction, external rotation-resisted internal rotation; FABER, flexion, abduction, external rotation; US, ultrasound, MRI, magnetic resonance imaging.

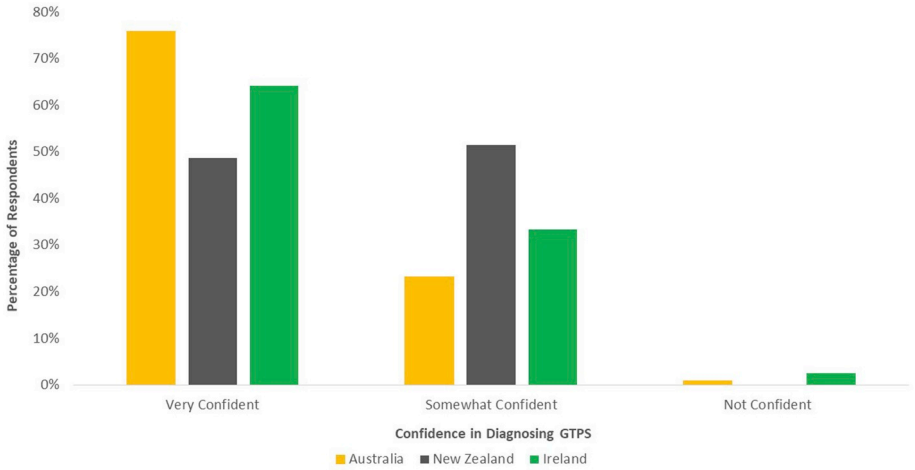

Fig. 2. Confidence in diagnosing GTPS (n = 361).

negative likelihood ratio (Ganderton et al., 2017; Grimaldi et al., 2017) making it an essential element for differential diagnosis of LHP, particularly for ruling out gluteal tendinopathy or GTPS. Of note, 8.9% of respondents do not use palpation as part of their assessment, thereby overlooking a test that should form the basis of physical examination of GTPS. Within our survey, reproduction of LHP during single leg stance ranked second on physical examination criteria for GTPS. This test, when sustained for up to 30 s, demonstrates high specificity (84–100%) (Lequesne et al., 2008) and a useful positive likelihood ratio (12.2) (Grimaldi et al., 2017).

Each of the remaining six tests were selected by less than 50% of respondents. Reproduction of LHP on the Flexion/Abduction/External Rotation (FABER) and Ober's tests have reasonable diagnostic utility for GTPS (Grimaldi et al., 2017; Ganderton et al., 2017; Fearon et al., 2013), with FABER useful for differentiating GTPS from hip OA (Fearon et al., 2013). Only 30% of respondents reported using the resisted derotation test or modified version (FADER-R), but both have reasonable utility in diagnosing GTPS (Ganderton et al., 2017; Grimaldi et al., 2017). This may reflect a lack of knowledge regarding usefulness of these tests, some of which have only been recently validated (Grimaldi et al., 2017; Ganderton et al., 2017; Fearon et al., 2013).

Use of imaging to support the diagnosis of GTPS was favoured more by Australian physiotherapists. Ultrasound proved most popular followed by MRI and hip x-ray. Research on the utility of US for detecting gluteal tendon pathology and trochanteric bursae is limited, with no controlled studies identified (Fearon et al., 2010; Connell et al., 2003). Magnetic resonance imaging, while considered the gold standard for assessing gluteal tendons (Bird et al., 2001; Woodley et al., 2008; Kong et al., 2007) yields high rates of false positive findings (Woodley et al., 2008; Westacott et al., 2011; Ganderton et al., 2017; Grimaldi et al., 2017). Therefore, caution should be applied in relying on imaging for diagnosing GTPS, although MRI may be useful for ruling out other pathologies.

Most clinicians surveyed reported that they use some current evidence in their assessment of patients with GTPS, however many also reported using suboptimal diagnostic methods. This may reflect on how physiotherapists acquire knowledge. It is apparent that physiotherapists use multiple methods, but most respondents ranked “hands-on clinical experience” first or second in their development of knowledge of GTPS, ahead of attending courses, consulting journals or attending conferences. It is recognised that there is no ‘one size fits all’ approach to knowledge acquisition with learning preferences or styles being an important consideration. A systematic review identified that physiotherapists at undergraduate, postgraduate and professional level predominantly learned ‘hands-on’ (situational learning), by applying previously learned knowledge, and gathering and assimilating information (constructivism) (Stander et al., 2019). It remains unclear which components of ‘hands-on’ learning can improve knowledge as it could also incorporate ‘learning from doing’, discussion with colleagues (Dannapfel et al., 2013) or integration of new knowledge with reflective practice. While “hands-on clinical experience” is likely to provide clinicians with valuable insight into pattern recognition and response to specific interventions it does not provide insight into diagnostic utility concepts. Thus, clinicians may have unfounded confidence in their ability to diagnosis GTPS.

It was encouraging that most (67.9%) physiotherapists reported they were “very confident” in diagnosing GTPS; however, this was not consistent between countries. Physiotherapists in Australia (76%) were

Table 3
Methods used to acquire knowledge on GTPS, mean rank (rank order) (n = 361).

	Australia (n = 211)	New Zealand (n = 72)	Ireland (n = 78)	Total (n = 361)
	Mean Rank[a] (Rank Order)	Mean Rank[a] (Rank Order)	Mean Rank[a] (Rank Order)	Mean Rank[a] (Rank Order)
Hands-on experience	3.55 (2)	2.81 (1)	2.74 (1)	2.61 (1)
GTPS course	3.43 (1)	5.48 (6)	3.84 (2)	2.94 (2)
Other course	4.18 (3)	4.57 (4)	4.74 (3)	3.42 (3)
Journals	4.37 (4)	4.05 (3)	4.74 (3)	3.62 (4)
Work in-service training	4.83 (6)	3.71 (2)	5.53 (7)	3.93 (5)
Colleagues	4.52 (5)	4.67 (5)	5.74 (6)	4.14 (6)
Conferences	5.77 (7)	6.10 (7)	5.95 (8)	4.90 (7)
Books	6.95 (8)	6.14 (8)	6.32 (9)	5.78 (8)
Social media	7.41 (9)	7.48 (9)	5.42 (5)	5.9 (9)

GTPS, Greater Trochanteric Pain Syndrome.
[a] Lower ranks indicate greater importance.

most confident compared to approximately 64% in Ireland and 49% of those in NZ. This may be in part due to physiotherapists in Australia reporting greater participation in GTPS-specific courses and potentially having more opportunities to access recent GTPS research and associated national and international education/conference activities led by Australian-based physiotherapists (Fearon et al., 2013, 2015, 2017; Grimaldi and Fearon, 2015; Grimaldi et al., 2015, 2017; Ganderton et al., 2017).

Although there is limited evidence from physiotherapy, studies in other professions highlight that clinical skills courses (Byrd et al., 2016) and training in evidence-based practice can improve confidence levels (Bennett et al., 2011; Hecht et al., 2016). However, we cannot directly correlate confidence with CPD activity in this study and it is possible that inter-country differences were due to cultural variation in levels of self-confidence. How confidence relates to information-seeking behaviour is unknown. It is possible that those with lower confidence are more likely to seek professional development opportunities whilst those who are highly confident may not consider further knowledge acquisition is required. Exploration of the links between translation of research into practice, knowledge acquisition and confidence through qualitative methodologies would provide greater insights.

5.1. Strengths and limitations

To ensure consistency in defining the problem we provided a definition of GTPS (Appendix A). No respondent withdrew from the study based on this definition, supporting our decision. The larger Australian population compared to NZ and Ireland, may skew results towards the Australian experience. However, presenting results by country allows the reader to compare across the three countries to ascertain how consistent physiotherapists are internationally in relation to diagnosis, confidence and knowledge acquisition.

5.2. Implications for research and practice

Future work needs to consider the value physiotherapists place on their clinical experience (Scott et al., 2012; Fristedt et al., 2016). It should also focus on the means by which educators can harness the hands-on experience of physiotherapists to facilitate translation of research into practice, while considering that education alone has limited ability to change clinical behaviour (Scott et al., 2012).

6. Conclusion

This is the first international survey to establish physiotherapists' diagnosis of GTPS, confidence and knowledge acquisition. Although most physiotherapists appear to be drawing on contemporary evidence in their assessment of patients with GTPS, a proportion are not, suggesting further knowledge translation activities are required.

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