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RESEARCH ARTICLE

Physiotherapists' awareness, knowledge and confidence in screening and referral of suspected axial spondyloarthritis: A survey of UK clinical practice

Eliza Steen[1,2] | Carol McCrum[3,4] | Melinda Cairns[2]

[1]Physiotherapy Department, Kings College Hospital NHS Foundation Trust, London, UK

[2]Department of Allied Health Professions and Midwifery School of Health and Social Work, University of Hertfordshire, Hatfield, UK

[3]Physiotherapy Department, East Sussex Healthcare NHS Trust, Eastbourne, UK

[4]Clinical Research Centre for Health Professions, University of Brighton, Eastbourne, UK

Correspondence
Eliza Steen, 50 Coopers Lane, Leyton, London E10 5DG, UK.
Email: eliza.steen@nhs.net

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Abstract

Background: Axial spondyloarthritis (axSpA) is an inflammatory disease associated with significant diagnostic delays and is commonly missed in assessments of persistent back pain.

Objective: To explore musculoskeletal physiotherapists' awareness, knowledge and confidence in screening for signs, symptoms and risk factors of suspected axSpA and criteria for rheumatology referral.

Design: An online UK survey was undertaken combining back pain vignettes (reflecting axSpA, non-specific back pain and radicular syndrome) and questioning on features of suspected axSpA. Recruitment utilised online professional forums and social media. Data analysis included descriptive statistics and conceptual content analysis for free text responses.

Results: 132 survey responses were analysed. Only 67% (88/132) of respondents identified inflammatory pathologies as a possible cause of persistent back pain. Only 60% (79/132) recognised the axSpA vignette compared to non-specific low back pain (94%) and radicular syndrome (80%). Most suspecting axSpA would refer for specialist assessment (77/79; 92%). Awareness of national referral guidance was evident in only 50% of 'clinical reasoning' and 20% of 'further subjective screening' responses. There was misplaced confidence in recognising clinical features of axSpA (≥7/10) compared to knowledge levels shown, including high importance given to inflammatory markers and human leucocyte antigen B27 (median = 8/10).

Conclusions: Musculoskeletal physiotherapists may not be giving adequate consideration to axSpA in back pain assessments. Awareness of national referral guidance was also limited. Professional education on screening and referral for suspected axSpA is needed to make axSpA screening and referral criteria core knowledge in musculoskeletal clinical practice, supporting earlier diagnosis and better outcomes.

KEYWORDS
back pain, musculoskeletal, professional education, screening, spondyloarthritis

1 | INTRODUCTION

Spondyloarthritis is an umbrella term for a group of systemic inflammatory disorders which includes axial spondyloarthritis (axSpA). axSpA causes enthesitis involving inflammation of spinal ligamentous and tendinous attachments to bone, which in its advanced stages can lead to joint erosion and fusion of the vertebral and sacroiliac joints (Danve & Deodhar, 2015; Kiltz, Baraliakos, Regel, Bühring, & Brau, 2017; Sieper & Poddubnyy, 2017). A characteristic feature of axSpA is persistent, and insidious back pain with inflammatory features of prolonged morning stiffness and pain which improves with movement but not with rest, termed 'inflammatory back pain' (Kiltz et al., 2017). Other features of axSpA may include peripheral manifestations involving dactylitis, enthesitis (typically at the insertion of the achilles tendon or plantar fascia) and inflammatory arthritis (Sieper & Poddubnyy, 2017). There is also an association with extra-articular inflammatory conditions of uveitis, psoriasis and inflammatory bowel disease (Danve & Deodhar, 2015; Sieper & Poddubnyy, 2017).

Axial Spondyloarthritis may underlie up to 5% of persistent back pain presentations (McKenna, 2010) and is often mistaken as chronic non-specific back pain (Jois, Macgregor, & Gaffney, 2008; Tangrungruengkit, Srinonprasert, & Chiowchanwisawakit, 2016). In the United Kingdom, the median time to diagnosis has been reported as 8.5 years and has been much longer for some people (Derakhshan et al., 2018). This delay in diagnosis prevents early intervention that may reduce the disease progression (Seo et al., 2015; Sieper & Poddubnyy, 2017) and the detrimental impacts on mood (Zhao et al., 2018), function (Danve & Deodhar, 2015), ability to work (Martindale, Shukla, & Goodacre, 2015) and complications including osteoporosis and cardiovascular disease (Strand & Singh, 2017).

Research undertaken in general practice (GP) (Jois, et al., 2008; Tangrungruengkit, et al., 2016) and specialities involved in extra-articular features of spondyloarthritis (Sykes, Hamilton, Jones, & Gaffney, 2018; Villani et al., 2015) have explored potential reasons for diagnostic delay. A lack of awareness of and screening for axSpA is an important factor.

One challenge is that back pain is common across populations with a lifetime prevalence of 60%–85% (Savigny, Watson, & Underwood, 2009) compared to the estimated prevalence of axSpA of 0.3%–1.2% (Danve & Deodhar, 2015; Kiltz et al., 2017). axSpA can also behave similarly to non-specific back pain problems and degenerative disc disease in pain characteristics; insidious onset, disturbed sleep and response to non-steroid anti-inflammatory medications (Arnbak, Jurik, Jensen, & Manniche, 2018; Danve & Deodhar, 2015; Jois et al., 2018; Sieper, Rudwaleit, et al., 2009; Strand & Singh, 2017). Poor public awareness of axSpA is also a factor (Harrison et al., 2014).

A cluster of features typical of 'inflammatory back pain' have been identified in 89% of axSpA cases, which have formed the basis for suspecting axSpA and the development of referral strategies (Rudwaleit, van der Heijde, et al., 2009; Sieper, Rudwaleit, et al., 2009). However, people with features of inflammatory back pain alone may not always receive a diagnosis of axSpA (Arnbak et al., 2018; Danve & Deodhar, 2015; Poddubnyy et al., 2011; Rudwaleit, van der Heijde, et al., 2009). Signal changes (modic changes) at the vertebral body bone marrow and neighbouring end plates seen on imaging in degenerative disc disease can present as inflammatory back pain (Arnbak et al., 2018) and sacroiliac changes, such as bone marrow oedema and sclerosis, can also occur in populations without axSpA (Weber et al., 2018).

The National Institute for Health and Care Excellence (NICE, 2017) have published clinical guidelines for axSpA to improve recognition and earlier referral. The guidelines were developed to reflect a balance of sensitivity, specificity and positive likelihood that would detect the substantial majority of undiagnosed spondyloarthritis without overburdening specialist services (National Institute for Health and Care Excellence, 2017). Awareness of the guideline recommendations and referral criteria are important to help reduce diagnostic delays and missing possible axSpA in back pain assessments (McCrum, 2019; NHS England, 2017; NICE, 2017).

Although awareness and knowledge of axSpA has been explored amongst General Practitioners and other medical specialities, as a key profession assessing people with back pain, there has not been research undertaken to date into awareness of and confidence of musculoskeletal physiotherapists in assessing and referring for features of possible axSpA. The aims of this study were to assess physiotherapists' clinical reasoning and management decisions on presentations of persisting back pain, ability to differentiate inflammatory back pain and axSpA from other back pain presentations, and evaluate awareness of NICE guidance (NICE, 2016; NICE, 2017) on back pain and recognition of clinical features and referral criteria for suspected axSpA.

2 | METHODS

2.1 | Ethics

Ethical approval was granted from the University of Hertfordshire, Health and Human Sciences Ethics Committee (HSK/PGT/UH/03202).

2.2 | Research design

A cross-sectional online survey of musculoskeletal physiotherapists working in the UK was undertaken from February to May 2018.

2.2.1 | Recruitment and sample population

Recruitment was directed at physiotherapists with at least one experience in the assessment of persistent back pain. An initial survey question was used to filter out respondents who had never treated a person with persistent back pain.

The survey was promoted through professional networks, musculoskeletal forums and social media (Twitter, LinkedIn,

Facebook and Physio Forum). Invitation emails were sent to post-graduate MSc students enrolled at the University of Hertfordshire, physiotherapy members of National Axial Spondyloarthritis Society (NASS) and AStretch, an axSpA specialist interest group. Permissions were sought to promote the survey and respondents were asked to snowball the survey to enhance response rates. Participation was self-selected and anonymous. On log-in, a participant information sheet was provided, and informed consent was assumed through completion of the survey.

2.2.2 | Survey design

A multi-strategy survey design was used which had three sections. A draft survey received feedback from a selection of experienced musculoskeletal physiotherapists, consultant rheumatologists and researchers experienced in survey design before piloting with several clinical physiotherapists using Bristol Online Survey Tool. Amendments based on feedback were incorporated at both stages. The development of the vignettes and clinical questions was informed by a literature review, clinical practice guidelines and strategies utilised in previous survey research. These included using the same age to avoid age-related factors (Bedson, Jordan, & Croft, 2003) and basing presentation on real client cases (Bishop, Holden, Ogollah, & Foster, 2016). The vignettes were designed to avoid ambiguity between presentations and be typical of the three diagnoses (axSpA, non-specific back pain and radicular syndrome).

Section One contained case presentation vignettes of persistent back pain (>3 months), each followed by a set of text questions. The first vignette was common across all surveys and open-ended questioning on screening for serious pathology and other differential diagnoses. This vignette and questioning were designed to assess whether respondents included an inflammatory cause in responses. The second vignette was a case presentation of either non-specific back pain or radicular syndrome. The third vignette was one of two axSpA case presentations. These vignettes were all followed by the same set of open-ended questions. Two axSpA presentations were developed to encompass the variability which can occur in respect to inflammatory back pain, extra-articular and peripheral manifestations. One of four variations of the vignette section was randomly allocated to respondents. These vignettes were all followed by the same set of open-ended questions (One of the final four surveys is provided in Data S1).

The vignettes were constructed using the NICE (2017) guideline recommendations and referral criteria on spondyloarthritis and all vignettes featured back pain persisting for longer than three months with onset before 45 years of age. These features alone should prompt consideration of possible axSpA.

The NICE (2017) guideline specifies nine additional features of signs, symptoms and risk factors for suspected axSpA, whereby the presence of four or more of these additional features should prompt referral for to rheumatology. If three features are present, the guidance recommends testing human leucocyte antigen B27 (HLA-B27) status. The two axSpA vignettes contained at least four of these nine additional features and included pertinent features drawn from previously published referral criteria: Assessment of Spondyloarthritis International Society (ASAS; Rudwaleit et al., 2009a, 2009b; Sieper, van der Heijde, et al., 2009), European Spondyloarthropathy Study Group (ESSG; Dougados et al., 1991) and Berlin criteria for inflammatory back pain (Rudwaleit, Feldtkeller, & Sieper, 2006) (see Table 1: Additional criteria from previously published referral criteria).

These vignettes were followed by open-ended questions asking respondents for their primary and secondary diagnoses, their 'clinical reasoning' and direction of 'further subjective screening' needed and the management strategy for each vignette presentation.

Section Two was a knowledge and confidence questionnaire with six sub-sections. Sub-section one evaluated respondents' knowledge of signs, symptoms and risk factors for axSpA (using a 1 to 10-point scale where 1 meant 'not at all important' and 10 meant 'very important' or a choice of unable to answer). Sub-section two explored self-reported confidence in the knowledge required to recognise features of suspected axSpA (using a 1 to 10-point scale where 1 meant 'not at all confident' and 10 meant 'very confident'). Sub-section three explored knowledge of importance of features when considering an underlying inflammatory disease from a list of inflammatory and non-specific back pain features. Section four to six explored awareness (yes/no) of the recently published NICE guidelines and Quality Standards on low back and radicular pain (NICE, 2016) and on spondyloarthritis (NICE, 2017), post-graduate training in back pain and spondyloarthritis and thoughts around the need for further education into recognising spondyloarthritis. Section Three sought demographic information.

There was no time limit on how long respondents could take to complete the survey. The participant information sheet advised that it would take approximately twenty minutes with Section One requiring much of that time. This time was determined by feedback on time burden from the respondents in the pilot process.

2.3 | Data analysis

Data was exported to Microsoft Excel® (Microsoft Corp) from Bristol Online Survey (Jisc) and analysed using conceptual content analysis and descriptive statistics (Robson & McCartan, 2016; Rossi, Serralvo, & Joao, 2014). The content of the free-text responses was analysed by the main researcher (Eliza Steen) for a priori features (based on NICE (2017) guidance referral criteria) and emergent features, assigned into categories and subcategories where applicable and then assigned numerical codes (see Table 1).

Descriptive statistics were used to analyse the frequency of the numerical codes within and across responses. The number of codes within responses were used to reflect levels of awareness of the signs, symptoms, and risk factors of axSpA and were graded; full awareness, good awareness, poor awareness, or no awareness (see Table 1). Associations were also analysed between vignette response

TABLE 1 Vignette analysis: Coding strategy applied to free text 'clinical reasoning' and 'further subjective screening' responses

Category and sub-category	Features of suspected axSpA (as per NICE guidance referral criteria)—a priori codes	Code
Awareness of NICE (2017) guidance on SpA: Baseline referral criteria	Back pain persisting longer than 3 months	1
	Onset before 45 years of age	2
Awareness of NICE (2017) guidance on SpA: Additional criteria • Full awareness = All features are identified in vignette (5/5 or 4/4) • Good awareness = Most features are identified in vignette (3−4/5 or 3/4) • Poor awareness = Some features are identified in vignette (1−2/5 or 1−2/4) • No awareness = No features identified in vignette (0/4 or 0/5)	Back pain before the age of 35 years	3
	Waking during secnd half of night	4
	Improvement with movement	5
	[a]Current or past arthritis	6
	[a]Current of past enthesitis	6
	Buttock pain	7
	Improvement within 48 h with NSAIDs	8
	Family history of spondyloarthritis or psoriasis	9
	Current or past psoriasis	10
Category	**Emergent features of suspected axSpA**	
Additional criteria from previously published referral criteria[b] (which should raise suspicion of inflammatory disease/axial spondyloarthritis)	Not relieved/worse with rest	11
	Early morning stiffness	12
	Investigations (e.g., CRP, HLA-B27)	13
	Insidious onset	14
	Other extra-articular conditions—uveitis, inflammatory bowel disease	15
	Other peripheral signs/symptoms (e.g., dactylitis, synovitis)	16
	24-h pattern (e.g., general night pain)	17

Abbreviations: axSpA, axial spondyloarthritis; CRP, c-reactive protein; HLA-B27, human leucocyte antigen B27; NICE, National Institute for Health and Care Excellence (NICE, 2017); NSAIDs, non-steroidal anti-inflammatory drugs; SpA, spondyloarthritis.

[a]Arthritis and Enthesitis both coded the same as the vignette content could have been interpreted as either.

[b]Assessment of Spondyloarthritis International Society (ASAS) criteria (Rudwaleit et al., 2009a, 2009b; Sieper, van der Heijde, et al., 2009), ESSG (Dougados et al., 1991) and Berlin criteria for inflammatory back pain (Rudwaleit et al., 2006).

results, guideline familiarity, confidence, level of knowledge and various demographic data.

3 | RESULTS

One hundred and fifty physiotherapists responded to the survey, with 132 usable data sets following data clearing. Data sets were excluded if incomplete, not working in the United Kingdom, or not a qualified physiotherapist. Respondents' demographics are presented in Table 2.

3.1 | Section One: vignettes

Vignette 1: Screening of persistent back pain presentations for serious pathology and other differential diagnoses.

In responses on screening required prior to physiotherapeutic intervention, the following causes were identified; 'inflammatory back pathology' 66% ($n = 88/132$), 'red flags' (expressed in various formats) 64% ($n = 85$), 'cancer' 59% ($n = 78$), 'cauda equina syndrome' 43% ($n = 57$), 'infection' 38% ($n = 51$), 'fracture' 28% ($n = 37$) 'neurological causes' 28% ($n = 37$) and 'visceral pathology' 25% ($n = 33$).

Vignette 2 (non-specific back pain or radicular syndrome) and Vignette 3 (axSpA): Recognition of primary diagnosis of persistent back pain case presentations.

Only 60% ($n = 79/132$) of respondents correctly identified the axSpA vignettes at primary diagnosis, compared with 94% ($n = 46/49$) for non-specific back pain and 80% ($n = 66/83$) for radicular syndrome (see Figure 1). Failure to recognise the case presentation was highest for the axSpA vignette at 23% ($n = 31/132$).

Ninety-four percent ($n = 50/53$) of respondents with an incorrect primary diagnosis for the axSpA vignette misattributed the presentation to non-specific back pain.

There was an association between more accurate answers in the axSpA vignette responses and familiarity with NICE guidance on spondyloarthritis, continuing professional development (CPD) on spondyloarthritis, working for the National Health Service (NHS), receiving GP referrals and higher professional grade. Non-recognition of the axSpA vignette was associated with caseloads of ≤30% back pain patients and ≤3 years musculoskeletal experience (Table 3).

TABLE 2 Respondent demographics

Demographics ($n = 132$)			
Years qualified		**Median 13 number**	**IQR 8–21 %**
Gender:			
	Female	84	64%
	Male	46	35%
	Prefer not to say	2	2%
Physiotherapy grade:			
	Basic grade	9	7%
	Senior grade	38	29%
	Specialist	30	23%
	Highly specialist	38	29%
	Expert	5	4%
	Not applicable	12	9%
Clinical interest in rheumatology:			
	Yes	19	14%
	No	113	86%
Musculoskeletal experience:			
	<1 year	10	8%
	1–3 years	14	11%
	>3–5 years	10	8%
	>5–10 years	39	30%
	>10 years	59	45%
Proportion of LBP pts in overall caseload:			
	<30%	11	8%
	30%	17	13%
	40%	27	20%
	50%	31	23%
	60%	13	10%
	70%	16	12%
	>70%	17	13%
Clinical setting[a]:			
	NHS	111	84%
	Primary care	*49*	*44%*
	Secondary care	*37*	*33%*
	Mixed	*25*	*23%*
	Private	39	30%
	Higher education	3	2%
	Research	2	2%
	Sports	7	5%
Referral sources of LBP patients[a]:			
	Consultant	85	64%
	GP	109	83%
	Other AHP	70	53%
	Self-referral	72	55%
	Other	5	4%
Region of UK:			
	Northern Ireland	4	3%
	Wales	2	2%
	Scotland	12	9%
	England	114	86%
Training:			
	BACK PAIN	115	87%
	SpA ($n = 121$)	71	54%

Abbreviations: GP, general practitioner; IQR, inter-quartile range; LBP, low back pain; NHS, National Health Service; pts, patients; SpA, spondyloarthritis.

[a]Respondents could indicate multiple responses.

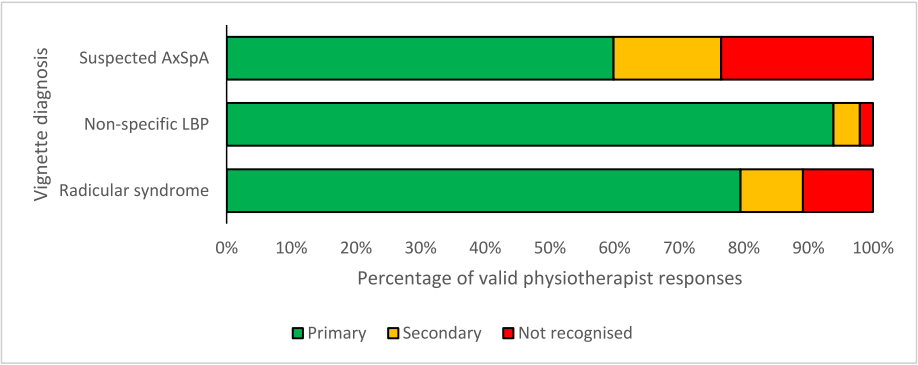
AxSpA vignette: Evaluation of 'clinical reasoning' and direction of 'further subjective screening'. Applying the content analysis codes in Table 1.

Only 4% ($n = 4/101$) of respondents correctly identifying the axSpA vignette mentioned the NICE guidance 'baseline referral criteria' of back pain >3 months and onset before 45 years in their 'clinical reasoning' responses. Varying levels of features from the NICE (2017) guideline 'Additional criteria' were included in 96% ($n = 97/101$) of the 'clinical reasoning' and 86% ($n = 87/101$) of 'further subjective screening' responses.

Other valid features categorised under 'Additional criteria from previously published referral criteria' were mentioned in 79% ($n = 80/101$) and 85% ($n = 86/101$) of 'clinical reasoning' and 'further subjective screening' responses, respectively.

3.2 | Clinical reasoning

Only 50% ($n = 51/101$) of respondents who correctly identified the suspected axSpA vignette as a primary or secondary diagnosis demonstrated 'full awareness' or 'good awareness' of the spondyloarthritis guideline recommendations, as described in Table 1, within 'clinically reasoning' responses. 'Full awareness' or 'good awareness'



AxSpA – axial spondloarthritis, LBP – low back pain

FIGURE 1 Associations with identification of vignette diagnosis. Abbreviations: AxSpA, axial spondloarthritis; LBP, low back pain

was demonstrated by 61% (n = 37/61) of respondents familiar with the NICE (2017) guidelines, compared to 33% (n = 13/40) of those not familiar (Figure 2).

3.3 | Further subjective screening

Only 20% (n = 20/101) of respondents who correctly identified the suspected axSpA vignette demonstrated 'full awareness' or 'good awareness' of the spondyloarthritis guideline recommendations within 'further subjective screening' responses. 'Full awareness' or 'good awareness' was demonstrated by 23% (n = 14/61) of respondents familiar with the NICE guidelines, compared to 15% (n = 6/40) of those not familiar (see Figure 3).

3.3.1 | Management strategy decision for axSpA vignette

An appropriate management decision of referral for specialist opinion was chosen by 92% (n = 73/79) of respondents who correctly identified the axSpA vignette at their primary diagnosis, with 61% specifying referral to rheumatology. Only 23% (n = 5/22) of respondents who considered axSpA as a secondary diagnosis chose to refer for specialist opinion, with 77% (n = 17/22) choosing physiotherapy management.

3.4 | Section 2: knowledge and confidence questionnaire

3.4.1 | Importance of signs, symptoms and risk factors for axSpA

Equally high importance (using a 1–10-point scale where 1 meant 'not at all important' and 10 meant 'very important') was given to elevated inflammatory markers, positive HLA-B27 antigen, current or history of psoriasis, inflammatory bowel disease, enthesitis, dactylitis and synovitis (median (inter-quartile range) = 8, range 7–10) and current or history of uveitis/iritis (median = 8, range 8–10). Least importance and more variability were observed for male gender as a risk factor for axSpA (median = 5, range 3–7).

3.4.2 | Confidence in recognising features of suspected axSpA

Correctly identifying the axSpA vignette was associated with higher self-reported confidence (median = 8/10) (using a 1–10-point scale where 1 meant 'not at all confident' and 10 meant 'very confident') in knowledge of clinical features of inflammatory back pain, the extra-articular and peripheral features associated with spondyloarthritis (see Figure 4). However, self-reported confidence was still relatively high in many respondents (59%) who inaccurately diagnosed the axSpA vignette with a median of 7 for knowledge of inflammatory back pain, and a median of 6 for the extra-articular and peripheral feature, although the overall range in self-reported confidence was much wider (see Figure 4).

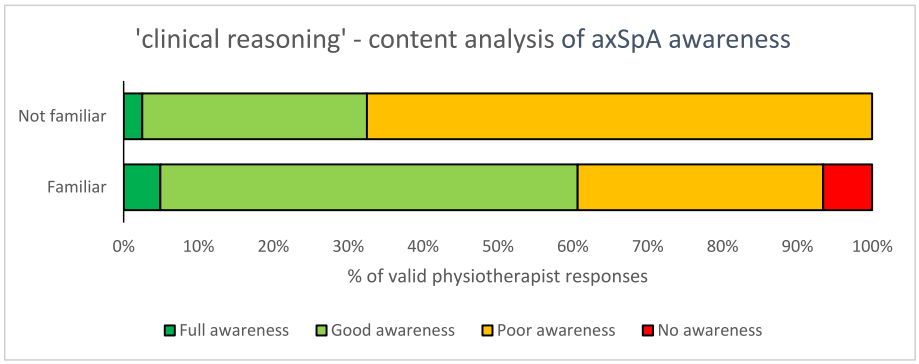
3.4.3 | Knowledge of features of inflammatory back pain

Only 27% of respondents recognised all features of inflammatory back pain (9/9) based on a combination of ASAS (Rudwaleit et al., 2009a, 2009b; Sieper, van der Heijde, et al., 2009), NICE (2017) and Berlin criteria (Rudwaleit et al., 2006) (see Table 4 for all nine features included in the question). The most recognised feature was early morning stiffness >30 min, 87%; n = 115/132. Only 64% identified both NICE guidance baseline referral criteria (2/2) of persistent back pain >3 months and onset before 45 years. Only 44% identified all additional NICE (2017) referral criteria (4/4) and 70% identified three referral criteria, whereby HLA-B27 testing is then recommended.

TABLE 3 Association between individual respondent's demographics and their responses to the vignettes

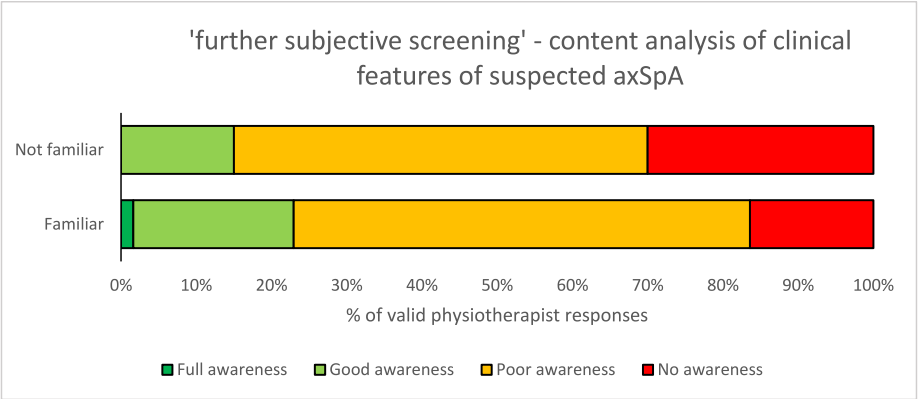
Vignette diagnosis	Suspected axial spondyloarthritis ($n = 132$)		
Diagnosis given by respondents	**Primary diagnosis % (*n*)**	**Secondary diagnosis % (*n*)**	**Not recognised % (*n*)**
All data ($n = 132$)	**60% (79)**	**17% (22)**	**23% (31)**
NICE SpA Guideline Familiarity:			
NICE—familiar	73% (52)	13% (9)	14% (10)
NICE—not familiar	44% (27)	21% (13)	34% (21)
Back pain training:			
Yes	60% (73)	17% (21)	22% (27)
No	55% (6)	9% (1)	36% (4)
SpA training:			
Yes	68% (50)	18% (13)	15% (11)
No	49% (23)	17% (8)	34% (16)
Experience (years):			
<1	60% (6)	10% (1)	30% (3)
>1–3	21% (3)	36% (5)	43% (6)
>3–5	90% (9)	0% (0)	10% (1)
>5–10	59% (23)	18% (7)	23% (9)
>10	64% (38)	15% (9)	20% (12)
% back pain pts in overall caseload:			
<30%	64% (7)	0% (0)	36% (4)
30%	53% (9)	12% (2)	35% (6)
40%	56% (15)	26% (7)	19% (5)
50%	65% (20)	10% (3)	26% (8)
60%	62% (8)	15% (2)	23% (3)
70%	56% (9)	25% (4)	19% (3)
>70%	65% (11)	24% (4)	12% (2)
NHS employed:			
Yes	65% (72)	18% (20)	17% (19)
No	33% (7)	10% (2)	57% (12)
Physiotherapist grade:			
Basic grade	33% (3)	33% (3)	33% (3)
Senior grade	53% (20)	21% (8)	26% (10)
Specialist	70% (21)	7% (2)	23% (7)
Highly specialist	74% (28)	18% (7)	8% (3)
Expert	80% (4)	20% (1)	0% (0)
Other	25% (3)	8% (1)	67% (8)
Referral source of back pain pts:			
GP	62% (68)	17% (19)	20% (22)
No GP	48% (11)	13% (3)	39% (9)
Self-referral	54% (39)	13% (31)	33% (29)
No self-referral	67% (40)	22% (13)	12% (7)

Abbreviations: GP, general practitioner; NHS, National Health Service; SpA, spondyloarthritis; pts, patients.



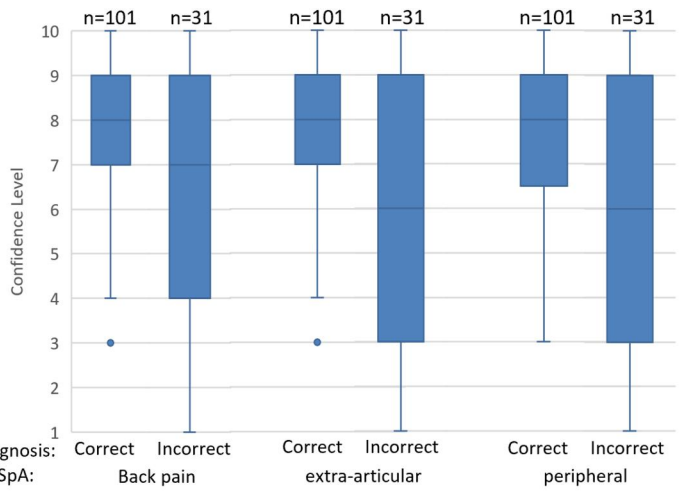
axSpA – axial spondyloarthritis

FIGURE 2 Association between familiarity with National Institute for Health and Care Excellence spondyloarthritis guidelines and awareness of features of suspected axial spondyloarthritis (axSpA). Abbreviation: axSpA, axial spondyloarthritis



axSpA – axial spondyloarthritis

FIGURE 3 Association between familiarity with National Institute for Health and Care Excellence spondyloarthritis guidelines and awareness of features of suspected axSpA. Abbreviations: axSpA, axial spondyloarthritis



n = number of respondents correctly identifying vignette (at primary or secondary diagnosis) and number of respondents who did not recognise axSpA vignette diagnosis

SpA - spondyloarthritis

FIGURE 4 Association between respondents' confidence in recognising features of axSpA and recognition of axSpA vignette diagnosis. *n* = number of respondents correctly identifying vignette (at primary or secondary diagnosis) and number of respondents who did not recognise axSpA vignette diagnosis. Abbreviations: SpA, spondyloarthritis

TABLE 4 Proportion of respondents identifying features of inflammatory back pain and relationship to demographic variables

Features of inflammatory back pain[a]	All data (%/*n*) (*n* = 132)	NICE familiar (*n* = 71)	NICE not familiar (*n* = 61)	Back pain Training (*n* = 121)	No back pain Training (*n* = 11)	SpA education (*n* = 74)	No SpA education (*n* = 47)	NHS (*n* = 111)	no-NHS (*n* = 21)	B5 (n = 9)	B6 (*n* = 38)	B7 (*n* = 30)	B8a (*n* = 38)	B8b (*n* = 5)	Other (*n* = 12)	GP referral (*n* = 109)	No GP referral (*n* = 23)	Self-referral (*n* = 72)	No Self-referral (*n* = 60)
Insidious onset of back pain	79% (104)	85% (60)	72% (44)	79% (95)	82% (9)	80% (59)	77% (36)	79% (88)	76% (16)	89% (8)	84% (32)	70% (21)	82% (31)	60% (3)	75% (9)	80% (87)	74% (17)	78% (56)	80% (48)
Symptom duration > 3 months	77% (102)	82% (58)	72% (44)	75% (91)	100% (11)	73% (54)	79% (37)	80% (89)	62% (13)	100% (9)	74% (28)	80% (24)	74% (28)	100% (5)	67% (8)	77% (84)	78% (18)	74% (53)	82% (49)
Age of onset < 45	80% (105)	89% (63)	69% (42)	80% (97)	73% (8)	84% (62)	74% (35)	83% (92)	62% (13)	67% (6)	79% (30)	80% (24)	87% (33)	80% (4)	67% (8)	81% (88)	74% (17)	74% (53)	87% (52)
Nocturnal pain worse in the 2nd half of the night resulting in awakening	86% (114)	92% (65)	80% (49)	86% (104)	91% (10)	89% (66)	81% (38)	87% (97)	81% (17)	89% (8)	82% (31)	90% (27)	89% (34)	100% (5)	75% (9)	88% (96)	78% (18)	86% (62)	87% (52)
Pain relieved by movement	73% (97)	87% (62)	57% (35)	73% (88)	82% (9)	80% (59)	62% (29)	77% (86)	52% (11)	44% (4)	71% (27)	63% (19)	95% (36)	100% (5)	50% (6)	76% (83)	61% (14)	69% (50)	78% (47)
Pain not relieved/ aggravated by rest	65% (86)	76% (54)	52% (32)	65% (79)	64% (7)	70% (52)	57% (27)	68% (75)	52% (11)	67% (6)	55% (21)	73% (22)	74% (28)	40% (2)	58% (7)	64% (70)	70% (16)	61% (44)	70% (42)
Pain relieved by NSAID'S within 48 h	86% (114)	93% (66)	79% (48)	86% (104)	91% (10)	89% (66)	81% (38)	87% (97)	81% (17)	100% (9)	82% (31)	83% (25)	95% (36)	80% (4)	75% (9)	84% (92)	96% (22)	88% (63)	85% (51)
Presence of buttock pain	57% (75)	75% (53)	36% (22)	57% (69)	55% (6)	68% (50)	40% (19)	60% (67)	38% (8)	44% (4)	39% (15)	53% (16)	84% (32)	60% (3)	42% (5)	62% (68)	30% (7)	54% (39)	60% (36)
Early morning stiffness in the back lasting > 30 min	87% (115)	93% (66)	80% (49)	87% (105)	91% (10)	92% (68)	79% (37)	88% (98)	81% (17)	100% (9)	84% (32)	83% (25)	89% (34)	100% (5)	83% (10)	89% (97)	78% (18)	83% (60)	92% (55)

[a]The four features of inflammatory back pain highlighted in bold are from the additional referral criteria in the NICE (2017) guidance and were used within the spondyloarthritis vignette questions.

Higher recognition of the features of inflammatory back pain was associated with familiarity with the NICE (2017) guidance, working in the NHS, prior education on spondyloarthritis and treating GP referred patients.

4 | DISCUSSION

This study used an online survey using back pain presentation vignettes and a questionnaire to evaluate physiotherapists' awareness, knowledge and confidence in recognising axSpA. Analysis evaluated respondents' clinical reasoning and management decisions and examined associations with demographic factors and clinician characteristics.

The survey found limited awareness, knowledge and confidence in the recognitions of features of inflammatory back pain, associated extra-articular conditions and peripheral features that are associated with suspicion of spondyloarthritis. These findings have significant implications concerning delayed diagnosis given that physiotherapists are commonly involved in the assessment and screening of persistent back pain, and their role in appropriate and timely onward referral for specialist assessment when indicated (Maher, Underwood, & Buchbinder, 2017). Diagnostic delays in axSpA are already significant (Derakhshan et al., 2018; Redeker et al., 2019) and the survey findings suggest physiotherapist are an important target for raising awareness of axSpA and professional education on recognition and referral to improve this issue.

The finding in this study reflects research undertaken with other key professions. General Practitioners and non-rheumatologist physicians have demonstrated poor awareness of inflammatory back pain and associated peripheral features and extra-articular inflammatory conditions (Jois et al., 2008; Tangrungruengkit et al., 2016; van Onna, Gorter, Meerendonk & van Tubergen, 2014). Only 5% of General Practitioners and 9.4% of non-rheumatologists identified all features indicative of inflammatory back pain (Tangrungruengkit et al., 2016). Only 6% of General Practitioners were found to consider all peripheral and extra-articular features of axSpA in their history taking (Jois et al., 2008). A recent UK survey of osteopaths and chiropractors also highlighted a lack of awareness and confidence in aspects of screening for possible axSpA (Yong et al., 2019).

This survey also found that case presentations that were typical of axSpA were commonly misattributed as persistent non-specific back pain. These findings reflect the difficulties that other healthcare professionals have been found to encounter when differentiating the symptoms of inflammatory back pain from non-specific back pain (Jois et al., 2008; Tangrungruengkit et al., 2016). Van Onna, Gorter, van Meerendonk, and van Tubergen (2014) found that 40% of General Practitioners were unfamiliar with inflammatory back pain symptoms and how to differentiate them from symptoms of non-specific back pain. Furthermore, Seo et al. (2015) found that 59% of axSpA patients had previously been misdiagnosed, of which non-specific back pain was the diagnosis in 62% of cases.

Misattribution may be partly due to poor awareness of the clinical features of axSpA, along with the common prevalence of non-specific back pain (90%–95% of back pain presentations) (Danve & Deodhar, 2015; Sieper & Poddubnyy, 2017) and moves to reduce over-investigation and medicalisation of back pain (Foster et al., 2018; NICE, 2016). There has been emphasis on the importance of appropriate screening within clinical history taking that has included inflammatory back pain (Maher et al., 2017; NHS England, 2017; NICE, 2016). The lack of appropriate further subjective screening found in this survey suggests that the questioning required to identify possible axSpA is not core practice in back pain assessments. Awareness of this element of assessments recommended in NICE (2016) guidance on back and radicular pain, UK National Back and Radicular Pain pathway (NHS England, 2017), and NICE (2017) guidance on spondyloarthritis has not adequately filtered into musculoskeletal practice and highlights the importance of an awareness campaign on screening in back pain assessments and how to question and recognise features of suspected axSpA.

The results of this survey suggest there is a lack of awareness of when to refer to rheumatology. Many respondents who cited axSpA as a secondary diagnosis in the suspected axSpA vignette inappropriately chose physiotherapy treatment rather than onward referral in accordance with referral guidance (NICE, 2017). This finding is significant given the diagnostic delays and importance of early intervention (Danve & Deodhar, 2015; Strand & Singh, 2017). An awareness raising campaign on recognition and referral of axSpA is supported by the finding that better recognition and appropriate referral were associated with respondents' familiarity with NICE (2017) guidance on spondyloarthritis and previous professional education on spondyloarthritis. This association reflects research that found improvements in history taking, raised awareness of spondyloarthritis and enhanced referral considerations in GP registrars following a series of educational interventions (van Onna, Gorter, Maiburg, Waagenaar, & van Tubergen, 2017) and supports the value of professional education of physiotherapists on spondyloarthritis screening and referral.

Better diagnostic accuracy was also associated with GP referred caseloads and working within the NHS. These respondents also saw a high proportion of back pain in their caseloads. The findings highlight the importance of targeting educational campaigns and guideline awareness beyond NHS settings and clinicians with low caseloads of back pain presentations.

It was common for respondents to report confidence in recognising clinical features of spondyloarthritis. However, the lack of recognition of the axSpA vignettes and the poor awareness and knowledge of the signs, symptoms and risk factors for axSpA demonstrated in their clinical reasoning responses, or knowledge of the referral criteria recommended by NICE (2017), suggests that this confidence is misplaced. There was some awareness shown of previously published referral strategies developed by ASAS (Rudwaleit et al., 2009a, 2009b; Sieper, van der Heijde, et al., 2009), the ESSG (Dougados et al., 1991) and Berlin criteria (Rudwaleit et al., 2006). However, the generally limited awareness of all these referral

strategies indicates their lack of penetration into the physiotherapy profession. This is unsurprising since there has been a paucity of journal articles on axSpA published in core physiotherapy or musculoskeletal health profession literature (McCrum, 2019). Survey analysis found that prolonged morning stiffness as a symptom suspicious of inflammatory disease is strongly embedded in physiotherapy screening practice.

Inflammatory back pain is considered the most recognisable symptom of axSpA in rheumatology literature (Sieper et al., 2009a, 2009b) and respondents showed most confidence with inflammatory back pain signs and symptoms as opposed to other associated features of spondyloarthritis. This compares with a similar study in GP (Jois et al., 2008). In the current survey, most respondents identified at least three clinical features of spondyloarthritis yet showed limited awareness of the same features within the axSpA vignettes, which, resulted in misdiagnosis and lack of appropriate onward referral. This discrepancy may relate to methodological limitations of the knowledge evaluation strategy since the features were embedded in a list for selection and may have resulted in false positive indications of knowledge.

Confidence was disproportionally high for the recognition of peripheral and extra-articular features of axSpA since the associations with suspected axSpA were poorly identified in the vignettes. These features also lacked mention in screening responses, and likely reflect similar missed screening in clinical practice. Since the presence of these features raises index of suspicion of axSpA, screening in back pain assessments is paramount (Danve & Deodhar, 2015; NICE, 2017). As key musculoskeletal professions in back pain assessment pathways, it is vital that physiotherapists should be skilled in when to suspect axSpA.

Respondents also attributed high importance to pathology investigations in suspecting axSpA, including elevated CRP and ESR and HLA B27 positivity. However, raised inflammatory markers, have low sensitivity and specificity (Almodóvar et al., 2014) and present in only 40%–50% of people with axSpA (Rudwaleit, Landewé, et al., 2009). The high importance given to HLA-B27 positivity may indicate a lack of understanding in the role of risk factors in the diagnosis of axSpA. Although a known risk factor for spondyloarthritis, HLA-B27 positivity has a low specificity (Almodóvar et al., 2014) and is present in the general population, with 8% positivity in Europeans (Sieper & Poddubnyy, 2017). NICE (2017) guidance highlighted that inflammatory markers results and HLA-B27 positivity or negativity do not rule in or rule out the possibility of axSpA. The survey results suggest that an up-to-date understanding of the role and interpretation of risk factors such as HLA-B27 positivity and inflammatory marker results is an important aspect in professional education on axSpA.

4.1 | Limitations

Several factors need consideration when interpreting the findings of this study including response bias and the convenience and self-selected sample that is low compared to the numbers of practicing physiotherapists assessing back pain presentations in the United Kingdom. A response rate of 132 usable results is not expected to be representative of all UK musculoskeletal physiotherapists. Respondents also tended to have more specialised musculoskeletal experience which may be explained through the targeted advertising of the survey. Respondents were predominantly female, based in the NHS and England, and with many at a senior level (band 6 as per Agenda for Change) which is representative of the workforce (Chartered Society of Physiotherapists, 2017). Only 11% (14/132) of respondents had a specialist interest in Rheumatology and so responses provided a sample that is reflecting the breadth of expertise within clinical musculoskeletal practice. Regardless of the limitations of the survey, results strongly indicate that more emphasis must be put on raising awareness of axSpA and its associated features and screening as part of routine clinical practice, thus ensuring timely specialist referral (NICE, 2017).

5 | CONCLUSIONS

This survey gives insight into physiotherapists' awareness, knowledge and confidence in recognising and referring for possible axSpA in the assessment of persistent back pain presentations. There was limited awareness shown of the signs, symptoms and risk factors for axSpA, which may have a role in diagnostic delays. There was also a common misattribution of pertinent inflammatory back pain features to a diagnosis of non-specific back pain. An ability to identify features of possible axSpA was associated with familiarity with NICE guidance on spondyloarthritis (NICE, 2017) and having undertaken professional education on spondyloarthritis. The findings indicate a need for professional education on screening and recognition of possible axSpA and when to refer to rheumatology. The survey offers a valuable evaluation tool for evaluating professional awareness and knowledge of axSpA and as an indicator for education needs. Further research is needed, both within physiotherapy and other professions assessing people with persistent back pain, to evaluate whether better awareness and knowledge impacts on diagnostic delay of axSpA.

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CONFLICT OF INTEREST

The authors declare that they have no competing interests.

AUTHOR CONTRIBUTION

ES was responsible for the conception and study design, literature review, data collection and analysis, and interpretation of the data and gaining ethical approval and drafting, submitting, and revising the

manuscript. ES undertook this research study as part of her MSc in Advanced Physiotherapy at the University of Hertfordshire.CMc contributed to study design, research focus and data interpretation and substantially contributed to the manuscript revisions. MC provided methodological advice and supervision of the research, including gaining ethical approval. She provided feedback and expert advice on the content of the manuscript. All authors agreed on the article revisions and approved submission of the article.

ETHICS STATEMENT

Ethical approval was granted from the University of Hertfordshire, Health and Human Sciences Ethics Committee (HSK/PGT/UH/03202).

DATA AVAILABILITY STATEMENT

The datasets used and/or analysed during the current study are available from the corresponding authors on reasonable request.

ORCID

Eliza Steen https://orcid.org/0000-0003-4120-8388

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