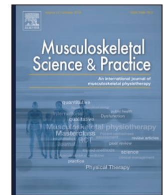
Contents lists available at ScienceDirect

Musculoskeletal Science and Practice

journal homepage: www.elsevier.com/locate/msksp



Original article

Cauda equina screening in Physiotherapy: A qualitative study of physiotherapists in a community musculoskeletal service Are we asking the right questions and are we asking the questions right?

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ARTICLE INFO

Keywords:
Cauda equina syndrome
Physiotherapy
Screening
Back pain
Assessment
CES

ABSTRACT

Cauda Equina Syndrome (CES) is a surgical emergency. With Physiotherapists increasingly taking on first-contact and spinal triage roles, screening for CES must be as thorough and effective as possible. This study explores whether Physiotherapists are asking the correct questions, in the correct way and investigates their experiences when screening for this serious condition.

Thirty physiotherapists working in a community musculoskeletal service were purposively sampled and participated in semi-structured interviews. Data was transcribed and thematically analysed.

All participants routinely asked bladder, bowel function and saddle anaesthesia screening questions although only 9 routinely asked about sexual function. Whether questions are asked in the correct way has never been studied. Sufficient depth of questioning, using lay terminology and explicit language was achieved by two-thirds of participants. Less than half of the participants framed the questions before asking them and only 5 participants combined all four dimensions. Whilst most clinicians felt comfortable asking general CES questions, half reported feeling uncomfortable when asking about sexual function. Issues around; gender, culture and language were also highlighted.

Four main themes emerged from this study; **i)** Physiotherapists ask the right questions but frequently omit sexual function questions, **ii)** mostly, Physiotherapists ask CES questions in a way that patients understand however, there needs to be improvement in framing the context of the questions, **iii)** Physiotherapists generally feel comfortable with CES screening but there is some awkwardness surrounding discussion of sexual function and **iv)** Physiotherapists perceive there to be barriers to effective CES screening caused by culture and language.

1. Introduction

Cauda Equina Syndrome (CES) is a rare but serious condition associated with back pain (Woodfield et al., 2022). The clinical syndrome is usually associated with radicular signs and symptoms such as lower limb pain and/or neurological deficits, saddle sensory changes and/or bladder, bowel, and sexual dysfunction (Fraser et al., 2009; Greenhalgh et al., 2018; Woodfield et al., 2023). Delay in diagnosing or treating CES can lead to these disabling symptoms in the long-term with significant distress (Seidel et al., 2021; Barker et al., 2021; Hogan et al., 2019; Hazelwood et al., 2019; Todd, 2017), higher risk of depression and poorer mental health post-decompression (Hazelwood et al., 2021). At one year, bladder dysfunction remained in 50% of patients, bowel dysfunction in 43% and sexual dysfunction in 51%. In addition, of those patients in employment before their CES diagnosis, 21% were not able to return to work at 1 year (Woodfield et al., 2023). It is generally agreed that surgery, if required, should be undertaken at the earliest opportunity because any delay potentially threatens outcome (Hogan et al., 2019; GIRFT. National, 2023). Good outcomes following decompressive surgery are achieved in most patients with early or incomplete-CES (Todd, 2017) and early decompression may help regain sexual function (Sangondimath et al., 2020). Recent evidence also suggests that implementation of local CES pathways decrease MRI waiting times and reduce numbers of hospital transfers to specialist spinal centres (Fraig et al., 2022).

Diagnosing CES however, is a challenge. Until recently, there has

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https://doi.org/10.1016/j.msksp.2023.102773
Received 11 January 2023; Received in revised form 11 April 2023; Accepted 3 May 2023
Available online 10 May 2023
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been no universal agreement of the definition of CES. Additionally, no individual sign or symptom can reliably predict Cauda Equina compression on imaging (Hoeritzauer et al., 2018) and therefore, these should not be used to decide whether to, or when to, request MRI. Magnetic Resonance Imaging (MRI) is now recognised as the critical diagnostic investigation and, if CES is suspected, should be undertaken as an emergency (GIRFT. National, 2023). Furthermore, clinical examination such as, digital rectal examination cannot be relied upon to support diagnosis due to lack of specificity and sensitivity (Hoeritzauer et al., 2018; Venkatesan et al., 2019), can cause a high risk of false reassurance and is not recommended (Tabrah et al., 2022). Perianal sensory testing however, remains advocated in the current guidance (GIRFT. National, 2023). Further diagnostic challenges are faced in certain groups of patients, for example, older patients where age-related bladder, bowel and sexual dysfunction pathologies co-exist (Comer et al., 2019) and where the gradual nature of spinal canal compromise from degenerative changes may allow time for the cauda equina nerve roots to adapt. Previous lumbar spine surgery is another complexity that has been associated with a higher frequency of re-presentation with suspected CES but actually sees a lower frequency of radiologically confirmed cauda equina compression (Pronin et al., 2020a).

With Physiotherapists working increasingly in first-contact and specialist roles, assessment of back pain including effective CES screening is essential. Failure, or delays, in diagnosis are often the top cited factor in litigation claims (Leech et al., 2021) and so, a new national pathway, to assist clinicians in the expeditious assessment, diagnosis and management of CES, has recently been published (GIRFT. National, 2023). Literature also suggests that, in addition to detailed knowledge of symptom presentation and progression (Sun et al., 2014), a consistent approach to red flag questioning may help overcome barriers in translating theoretical knowledge into clinical practice (Ferguson et al., 2015). One suggested method is to use cue cards to “aid communicating sensitive, sometimes subtle but important symptoms and form the basis of clinicians questioning” (Finucane et al., 2020). Several recently published documents provide a framework for the assessment, diagnosis and management of CES (England, 2017; Network, 2020).

So, what are the right questions? In 1934, Mixter and Barr, referenced in O’Laoire (O’Laoire et al., 1981), first described paralysis of bladder and bowel due to Cauda Equina compression. Since then, evidence has evolved and questions around altered bladder and bowel function, sensation of the saddle area and genitals and sexual function are now considered crucial to diagnosis (Greenhalgh et al., 2018; Shapiro, 2000; Korse et al., 2013; Balasubramanian et al., 2010; Pronin et al., 2020b). Whilst quite clear that no single clinical sign or symptom can be used to diagnose CES or accurately predict MRI-positive Cauda Equina compression (Angus et al., 2021), criticism of the utility of ‘traditional red flags’ as screening tools has suggested they are based on weak evidence (Verhagen et al., 2016; Cook et al., 2018). Hypotheses are emerging that genitourinary symptoms previously attributed to CES may actually be triggered by changes in brain-bladder feedback, caused by acute pain, in vulnerable individuals, exacerbated by medication and anxiety, and commonly presenting with features of functional neurological disorder (Hoeritzauer et al., 2021). Despite poor diagnostic accuracy of red flags however, early recognition of potential CES remains crucial in order to direct appropriate imaging and presently, these questions are the best screening tools available (Greenhalgh et al., 2018; Dionne et al., 2019) and are advocated in current national and international guidelines (Finucane et al., 2020; Network, 2020).

Given that we know the right questions to ask, do we know how to ask them in order to elicit the most useful responses? Studies into patients’ lived experiences of CES have facilitated the development of a ‘toolkit’ to aid early identification and have reported differences between what clinicians and patients perceive is being asked (Greenhalgh et al., 2016). Patients may not understand the gravity of CES because extreme pain may mask early urogenital symptoms, they may use language differently from clinicians or may believe the questions are irrelevant to their presentation. The language used by clinicians asking the CES screening questions is therefore crucial and should be clear, non-medical and explicit (Greenhalgh et al., 2015). In addition, safety-netting (ensuring that patients with unresolved or worsening symptoms know when and how to access further advice) is an important way of reducing clinical risk and should be embedded in all consultations (Greenhalgh et al., 2020).

Previous studies have reported variable documentation of clinical features with; urinary function and saddle sensation recorded reasonably well (Ferguson et al., 2010), bowel function recorded poorly and features including sexual dysfunction rarely documented (Korse et al., 2013; Pronin et al., 2019). This casts doubt on whether the appropriate screening questions are being asked and additionally, the documentation of symptoms does not necessarily equate to effective questioning (Cooney et al., 2017).

Gaining insight into the lived experience of clinicians asking CES screening questions (in the way patients have identified as necessary) has not been studied. The aim of this study therefore, is to explore Physiotherapists’ experiences in terms of both, level of understanding of the signs and symptoms of CES and their feelings when asking CES screening questions. It is anticipated that this study will provide evidence of the depth and adherence to current guidance of, and highlight potential barriers to, CES screening by Physiotherapists.

2. Methodology

The novel element of this research was this exploration of the feelings of healthcare practitioners rather than patients and as such, a Phenomenological study of musculoskeletal (MSK) Physiotherapists was conducted with the aim of capturing rich data and enabling in-depth understanding of their lived experience of and their feelings associated with, CES screening.

2.1. Ethical approval was granted (ref. HST1920-012)

Recruitment was by purposive sampling of qualified Physiotherapists working within the field of MSK in the researcher’s Community Trust. Participation was entirely voluntary. Interested Physiotherapists were provided with a detailed participation information sheet (PIS), which included the specifics of how to voluntarily withdraw from the study, at any time, if desired, at the time of invitation. Following a period (up to a week) to read the PIS and ask any questions, participants all gave written consent to the author before data collection began. During the consent meeting, participants were reminded that they could withdraw from the study, at any point, without consequence. If this occurred after data capture, they would be asked to confirm if they wished for their data to be removed from the study and destroyed.

Data were captured solely by the researcher using a series of one-off, semi-structured interviews which were audio-recorded, transcribed verbatim and subjected to thematic analysis (TA). The interview questions are detailed in Table 1. No funding was available for this project therefore, TA was performed manually, without the use of software. Transcripts were analysed by the researcher, keywords were noted and grouped, then themes were derived from the groupings. Interview transcripts were member-checked by participants to validate accuracy and to provide the opportunity to reflect on and review their responses.

Nine, semi-structured questions formed the basis of the interviews. There is currently no recognised standard relating to CES screening questioning but extensive research (Greenhalgh et al., 2015, 2016, 2018) has recommended that questions should be; 1. framed to provide context, 2. asked using lay terminology and 3. asked using explicit language. Table 2 documents the specific terms that have been developed from patient engagement (Greenhalgh et al., 2016) and that this study has used as ‘gold standard’.

Table 1
Interview questions.

Question No.	Question
1	What band are you and how many years' experience do you have treating back pain patients?
2	What Cauda Equina Screening questions do you ask?
3	How do you ask the questions that you do?
4	How do you feel when you are asking the questions?
5	Are there any questions that you feel uncomfortable asking?
6	Do you know why you are asking all of the questions that you do ask?
7	Are there any questions that you do not ask?
8	How confident are you, that you are screening for Cauda Equina Syndrome effectively?
9	Do you feel that your department/clinical environment has any effect on either the way you ask or the way the patients answer your Cauda Equina screening questions?

Table 2
'Gold standard' CES nomenclature.

- Loss of feeling/pins and needles between your inner thighs or genitals
- Numbness in or around your back passage or buttocks
- Altered feeling when using toilet paper to wipe yourself
- Increasing difficulty when you try to urinate
- Increasing difficulty when you try to stop or control your flow of urine
- Loss of sensation when you pass urine
- Leaking urine or recent need to use pads
- Not knowing when your bladder is either full or empty
- Inability to stop a bowel movement or leaking
- Loss of sensation when you pass a bowel motion
- Change in ability to achieve an erection or ejaculate
- Loss of sensation in genitals during sexual intercourse

3. Results

Thirty Physiotherapists, ranging from Band 5-8a with 0.6–38 years' experience (mean = 12 years) were interviewed. All 30 participants stated that questions relating to saddle sensation, bladder and bowel function are asked routinely but only 9 participants stated that they also include questions relating to sexual function with example responses such as:

"*I would ask do you have any bladder or bowel disturbance. I don't ask the sexual function ones routinely*" (Band 7)

"*I ask about bladder and bowel and saddle anaesthesia, points around that. I don't tend to talk about sexual function*" (Band 6)

"*the one that would sometimes cause discomfort and embarrassment is asking about sexual function, so that's not a question I would ask routinely*" (Band 8a)

The range of experience of the 9 participants that ask all questions routinely was <1–16 years (mean = 9.2) including physiotherapists across all bandings B5-8a.

Of the 21 participants who do not routinely ask sexual function questions, 11 would include them following a positive response to questioning about saddle sensation, bladder and bowel function, as demonstrated by this quote:

"I don't ask the sexual dysfunction one routinely unless I was expanding on initial bladder or bowel dysfunction or altered sensation" (Band 7)

Only six clinicians satisfied all three recommendations relating to *how* questions should be asked; and just 5 participants asked all questions routinely and asked them in the way recommended in the literature, i.e. framing/contextualising the questions before asking them.

When discussing how they feel when asking CES screening questions, 25 participants responded positively. Confidence in their screening was seen across all clinical bands (Seidel et al., 2021; Barker et al., 2021; Hogan et al., 2019; Hazelwood et al., 2019) and experience (range 1–33years), but higher bands (Hogan et al., 2019) reported greater confidence. Reasons given included, training, using supportive resources, previous clinical experience and the recent exposure of CES in professional media. Ten participants, from all clinical bands, reported feeling less confident in CES screening and gave reasons such as: lack of knowledge (of how questions are interpreted by patients from different cultures, of differential diagnoses and of the presentation of CES itself), fear of missing a diagnosis, exemplified by this quote:

"*I'm not going to lie, I feel a bit nervous because I want to make sure I'm getting the right answers*" (Band 6)

Personal feelings about asking intimate/personal questions, lack of exposure to CES patients and concerns regarding the validity of the CES screening questions, as demonstrated by this quote:

"*I believe that by asking the questions as directly as I do, that I'm screening it as well as I possibly could be in the remit of the clinical uncertainty*" (Band 8a)

Twelve participants reported feeling awkward during CES questioning, with 15 participants reporting feeling uncomfortable when specifically asking sexual function questions, exemplified here:

"*Sexual function can be a bit uncomfortable, depending on who you're dealing with, elderly people maybe*" (Band 5)

"*Sometimes the sexual function question is quite awkward*" (Band 6)

Eight added that this was worse when assessing patients of the opposite gender with quotes such as:

"*If it's a female patient, I feel uncomfortable being a male clinician*" (Band 6)

The final question relating to the clinical environment revealed several themes. Overwhelmingly, participants felt more comfortable or believed patients were more comfortable in a single-bedded/private area rather than a multi-bedded department. Feeling comfortable within the clinical environment was strongly linked to the belief that this facilitated a more candid patient response and more accurate assessment. A couple of quotes demonstrate this:

"It feels more appropriate to be asking those kind of questions in a private environment" (Band 8)

"Patients are a lot more reluctant because you can hear what's going on in the next cubicle" (Band 7)

The next theme emerging from the interviews was around language, interpreters, culture and gender. It was felt by some participants that assessment was challenging and potentially less effective when undertaken via an interpreter with one quote simply:

"I don't know what the interpreter is asking" (Band 7)

or when a patient had poor English with several participants saying:

"broken/poor English affects comprehension of the questions" (Bands 6 & 7)

4. Discussion

Cauda Equina Syndrome is a rare but serious condition that potentially needs treatment on an emergency basis (Woodfield et al., 2022; Hogan et al., 2019; Sangondimath et al., 2020; Long et al., 2020). Prompt diagnosis is therefore essential but, on the basis of signs and symptoms alone, diagnosis is unreliable (Hoeritzauer et al., 2018; Dionne et al., 2019) and emergent imaging is essential. Medical literature, following extensive work with patients that have had and continue to live with long-term symptoms of CES, clearly documents the questions that may raise suspicion of CES. This has established the most effective way of questioning to facilitate understanding of CES, communicate its

potential gravity and lead to open and honest patient responses (Greenhalgh et al., 2015, 2016, 2018). The aims of this study were, 1. To examine whether Physiotherapists are asking the right CES screening questions, 2. To determine if CES questions are being asked in the right manner and 3. To explore the thoughts and personal feelings of Physiotherapists when asking these questions.

1. Are we asking the right CES screening questions?

It is acknowledged that most clinical guidelines surrounding red flags base their recommendations on consensus (Verhagen et al., 2016) and that no red flags can specifically predict conditions such as CES. Certain red flag symptoms however, such as new urinary retention and saddle sensory disturbance, may be indicative of certain serious spinal pathologies (Galliker et al., 2020) such as CES. In the absence of anything more specific or sensitive, thorough questioning and examination is considered essential (Greenhalgh et al., 2018). This study aligns with previous research, confirming that questions relating to saddle sensation, bladder function and bowel function were routinely asked (Hoeritzauer et al., 2018; Pronin et al., 2020b).

Despite excellent questioning around bladder, bowel and sensory symptoms, questions relating to sexual function, were not routinely asked. This is consistent with previous research (Korse et al., 2013; Pronin et al., 2020b) which reported that sexual function was poorly documented, with similar reasons given to those in this study, including sociocultural differences, patient and doctor factors and a patient's old age. Sociocultural and age factors were also reported in this study and are discussed later. Half of the participants who did not routinely ask the sexual function questions in this study (n = 11) stated that they would following a positive response to bladder, bowel and saddle sensation questions. The sexual function questions were omitted by clinicians across the range of clinical bands including 83% omission at band 7 level, (with mean clinical experience 18.3 years) suggesting this issue is not due to inexperience. Aligning with previous research, awkwardness on the part of both clinician and patient when discussing sexual function, is one suspected reason for the frequent omission of these questions during the CES screening.

Sexual health research has similarly concluded that "nurses and physicians fail to engage in meaningful conversations with patients about sexual health due to beliefs that sexual health is private and their own personal discomfort when discussing it" (Fennell and Grant, 2019). Reasons previously reported for omitting sexual function questions include a lack of knowledge or possibly, the inadequacy and variety of definitions of sexual dysfunction (Fraser et al., 2009). One study participant demonstrated this lack of up-to-date knowledge with the quote:

> *"If their sensation is there and there is no saddle anaesthesia, I didn't think there was any reason to ask about sexual function"* (Band 6).

Mangialardi et al. (2002) stated that in certain cases, CES may present with sexual dysfunction alongside normal urinary function. This specific finding has not been addressed in the literature since the original article however, many studies have cast doubt on any individual sign or symptom being able to predict MRI-positive CES (Dionne et al., 2019; Korse et al., 2017). Specific data on sexual function is lacking in CES literature (Korse et al., 2013) and it is almost certainly under-documented (Korse et al., 2017). In fact, documentation of assessment findings was previously reported as complete in only 3% of suspected CES cases (Mehta et al., 2015). Considering the gravity of CES and the lack of certainty regarding sexual function as a sign or symptom still, it ought to be included in the screening questions however, it is now recognised that low back pain with sexual dysfunction as the only other feature is unlikely to be CES (GIRFT. National, 2023). The frequent omission of sexual function from the screening in this study aligns with previous research and demonstrates that there is still a knowledge gap within Physiotherapy and therefore a need for ongoing education around the manifestation of CES and its symptomatology, particularly relating to the assessment of sexual dysfunction.

2. Are we asking the CES screening questions in the right way?

No validated tool exists against which to 'measure' participants responses however, recommendations from previous research (Pronin et al., 2020b; Greenhalgh et al., 2016; Reese et al., 2019) are widely accepted as the gold standard. Analysis of the results from this study confirm that two-thirds of participants used appropriate terminology and language but only one-third of participants framed the questions before asking them. The significance of these questions in forming an accurate diagnosis has previously been shown to be misunderstood by patients and therefore framing the questions in order to add context is recommended (Greenhalgh et al., 2015). To the researcher's knowledge, this is the first study to evaluate how CES screening questions are asked. Previous published work investigating understanding and documentation of spinal red flags (rather than CES specifically) also revealed the use of vague terminology, the omission of certain questions and a lack of knowledge (Ferguson et al., 2015; Cooney et al., 2017) suggesting the issue may be profession-wide. Only one-sixth of participants in this study combined questioning to sufficient depth, used appropriately explicit and lay terminology and framed the questions. These 5 participants were spread across the spectrum of clinical banding (Seidel et al., 2021; Barker et al., 2021; Hazelwood et al., 2019) and had an average of 8.1 years' experience treating back pain, suggesting that asking CES screening questions the right way, is not linked to experience. Reasons as to why CES screening questions were not, on the whole, posed in the way that has been recommended as essential are hypothesised to be linked to the way that Physiotherapists' feel when asking them and are discussed below.

3. How do Physiotherapists feel when asking the CES screening questions?

The feelings of Physiotherapists when screening for CES have never previously been reported in published literature. This study revealed that more than two-thirds of participants felt comfortable or confident with the questioning in general. The service in which this study was conducted uses standardised pro-forma, including all the CES screening questions as an aide memoir, and as recommended in previous CES publications (Greenhalgh et al., 2016).

Half the study participants stated that asking questions around sexual function made them feel uncomfortable or awkward with 8 participants adding that this was worse with patients of the opposite sex. When discussing why this group of questions made them feel uncomfortable, reasons given were varied however the themes were; lack of knowledge/experience, personal discomfort asking intimate questions, asking sexual function questions to the opposite sex, age and lack of cultural competence. The results of this study align with previous research into Physiotherapists' assessment of red flags, highlighting barriers to translating knowledge into practice (Ferguson et al., 2015). Furthermore, lack of knowledge has been shown to correlate with lower levels of confidence (Eades et al., 2019), especially in less common disorders. The results of this study therefore suggest the need for further education within Physiotherapy around CES, because even brief educational interventions have been proven to impact knowledge, attitudes and confidence (Clarke et al., 2015).

Difficulty discussing matters specifically relating to sex or sexual function is not new (Fennell and Grant, 2019; Reese et al., 2019), nor is the perception that sexuality is taboo (Traumer et al., 2019) or finding discussing sexual function with patients of the same sex easier (Korse et al., 2013; Traumer et al., 2019). Omitting sexual function discussions with older patients is also common. This has been reported to be due to perceptions that older people have little interest in sex (Annerstedt and Glasdam, 2019; Malta et al., 2018). In oncology nursing as an example,

sexual function was prioritised lower than other physical symptoms (Annerstedt and Glasdam, 2019). The discomfort that Physiotherapists reported in this study was due to similar reasons. Further consideration of how to reduce the stigma/taboo surrounding sexual function discussion is needed but may be partially improved with simple clinician education. Contrary to perceptions of clinicians from this and previous studies, older adults are comfortable and do not get embarrassed when talking about sexual function (Farrell and Belza, 2012).

The World Health Organisation advocates that "cultural nuances and meaning behind words must be fully understood by healthcare practitioners (HCPs) and patients for information exchange about patients' symptoms and their social world in order to deliver comprehensive, equitable healthcare" (McGarry et al., 2018). Language capacity was found to influence migrant women's ability to both utilize care and comprehend care providers' instructions. Even those with intermediate levels of the HCP's language found medical terminology by doctors difficult to understand (Tschirhart et al., 2019). Research also reports that in some ethnic dialects, there is a limited sexual health vocabulary and verbatim interpretation loses accuracy (Tuteja et al., 2017). In many cultures and migrant communities, sexual health is associated with shame and is taboo with discussion of sex-related issues in the presence of men being especially sensitive (Svensson et al., 2017). The concept of "cultural competence" within healthcare is described as the "ability of health providers and organisations to deliver health care services that meet the cultural, social and religious needs of their patients and their families" (Swihart and Martin, 2020). Improving cultural-competence in Physiotherapy may address some of the awkwardness felt when discussing sexual function and in-turn, improve efficacy of CES screening. Research in this area is limited and focus on the cultural significance of CES questions is recommended. Furthermore, engaging interpreters in the process of this future research may help to overcome the cultural gaps between HCPs and non-English-speaking patients as they can serve as more than just translators by bridging the linguistic divide and closing these cultural gaps (Rosenbaum et al., 2020).

5. Limitations

The researcher acknowledges that bias is an inescapable phenomenon in qualitative research. This study was conducted within a single MSK service and the one in which the author is employed as the clinical lead. A potential power imbalance between researcher and participants is acknowledged with attempts to mitigate this through design of the questions. Additionally, the researcher was solely responsible for data capture, transcription, and analysis, introducing the possibility of a significant amount of bias. This was due to MSc dissertation limitations. The way in which the questions were designed was intentional to try and mitigate any impact of a single researcher.

Despite these limitations, similar worries about missing diagnoses, mutual embarrassment between HCPs and patients and language barriers have been reported by Physiotherapists in other parts of the United Kingdom (Paling and Hebron, 2021) suggesting that the findings of this study may be generalizable across the profession.

The study design, that of one-to-one interviews, could be seen itself as a limitation however, the design was chosen for ease of sampling and having considered the recommendations from previous research (Ferguson et al., 2015).

6. Conclusion

In this first study to explore the depth and quality of CES questioning and the feelings that CES questioning evokes within Physiotherapists, four main themes emerged; **1.** Physiotherapists do ask the right questions but frequently omit those concerning sexual function, **2.** Physiotherapists do, to an extent, ask the CES questions the right way but questions need contextualising and to be asked in more depth, **3.** Physiotherapists generally feel comfortable with CES screening but there is some awkwardness surrounding discussion of sexual function and **4.** Physiotherapists perceive there to be barriers to effective CES screening caused by culture and language that need to be better understood and addressed by future research. Finally, this study also highlights the importance of information exchange but also, the cultural and social difficulties in potentially doing so.

Funding

Nil.

Ethics approval

Ref. HST1920-012.

Declaration of competing interest

Nil.

Acknowledgements

Nil.

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