Title

Must the show go on? A qualitative study exploring barriers and enablers to manual therapists' care of dancers.

Andrade, P., & Thomson, O. P. (2024). Must The Show Go On? A Qualitative Study Exploring Barriers And Enablers To Manual Therapists' Care Of Dancers. *Journal of Dance Medicine & Science* https://doi.org/10.1177/1089313X241255441

Abstract

Introduction: Dance Medicine is a growing discipline, and healthcare for dancers requires appreciating particularities of their artistic craft. Manual therapists (MTs) are often dancers' first choice when seeking care. Whilst dancers' experiences of injury and healthcare have been extensively researched, little is known of MTs' perspectives of caring for them.

Aim: This study aimed to gain an understanding of MTs' perspectives of caring for dancers. Communication, treatment strategies and obstacles to a successful therapeutic alliance were examined to broaden knowledge and improve care.

Methods: This was a qualitative study using Grounded Theory as a framework for data collection and analysis. A purposive sample of 8 participants was recruited - physiotherapists, chiropractors, and osteopaths with 2+ years' experience of treating dancers. Data collection was conducted via semi-structured interviews, which were transcribed verbatim, anonymised, member checked, and later analysed.

Results: Data analysis constructed 3 categories which described the range of participants' experiences. Two categories were identified – i. *A Strangled Industry,* and ii. *Be-all End-all Patients* – and found to culminate in a core category: iii. *Beyond Hands-on*, which exemplified MTs' attempts to address clinical challenges.

Conclusions: MTs experience several challenges when providing healthcare to dancers. These encompass psychosocial aspects relating to dancers' internal world and the dance industry environment. It suggests that caring for dancers demands comprehensive, collaborative, and psychologically informed approaches. Emphasis should also be given to developing and implementing dance-specific pain science for all stakeholders.

Introduction

Dance Medicine is a growing clinical discipline. Several universities worldwide offer post-graduate programs in the subject, and specialised clinics within educational settings and private practice are increasingly being introduced. In the UK, institutes like The British Association of Performing Arts Medicine (BAPAM) and the National Institute for Dance Medicine and Science provide clinical care, evidence-based training and resources, and promote research in the field[1,2]. The inception of these organisations has notably been in response to research indicating that dancers present high injury rates[3,] whilst having specific healthcare demands not routinely known to and addressed by medical professionals until the late 1980s[4].

Dancers' Injuries and Sense-of-self

Injury incidence has been investigated within different dance styles. Ballet epidemiology seems the most researched[5], followed by Contemporary[6], Modern[7] and Irish Dance[8]. These genre-specific studies reported 1-year injury incidence. Subsequent research has investigated dance injury mechanisms, helping to advance current understanding of biomechanical and physiological demands of different dance styles[9,10].

Due to the physically demanding nature of dancing, clinicians and academics often classify dancers as athletes to understand and address their health. Whilst similarities cannot be denied, considering dancers' experience of self in relation to injury seems paramount in providing person-centred care. Ethnographers have explored how dancers' motivations and embodied experience shape this sense of self[11]. Injured dancers report loss of identity, feelings of disembodiment and lack of means to express themselves[12]. A qualitative study also showed that dancers often take personal responsibility for injuries, resulting in feelings of guilt and shame[13].

Dancers' Experience of Healthcare

Dancers are known to avoid or delay seeking medical help for pain and injury, often continuing to dance through them, as found on cross-sectional research on injury reporting in professional dancers[14]. A prospective cohort study suggested that this might result from infrastructural elements, i.e., low-income and lack of specialised care; as well as behavioural aspects, i.e., pain tolerance and fear of injury repercussions[15]. Another survey with pre-professional dancers has also shown a preference for dance teachers as first-line care providers over Healthcare Practitioners (HCPs)[16]. Dutch dancers at different career stages challenge these findings, mostly seeking care from physiotherapists and medical doctors[17]. This suggests that professional stage and country-specific health provision may influence access to and satisfaction of medical care for this population.

Lack of trust in HCPs further implicate dancers' help-seeking behaviours, and often involve being misunderstood by clinicians and receiving unhelpful advice[18]. This frequently includes communication barriers with clinicians who lack dance-specific vocabulary[19], leading dancers to favour HCPs with personal experience of dancing, as shown in empirical studies[20]. When dancers do seek help from HCPs, they prefer

manual and physical therapists for their holistic approaches[21]. Haikal et al. (2021)'s survey found that dancers in Quebec (n=144) most often consulted osteopaths (47.9%), followed by physiotherapists (36.1%). Despite being the most popular healthcare choice amongst dancers, no study to date has investigated the perspectives of a wide scope of manual therapists (MTs) with expertise in caring for dancers. Therefore, drawing from extensive research exploring dancers' experiences[22,23], this study aimed to get an understanding of perspectives of osteopaths, physiotherapists, and chiropractors with experience of working with dancers.

Methods

This study followed the consolidated criteria for reporting qualitative research (COREQ)[24].

Research Design and Paradigm

This was a qualitative study design situated within an interpretive paradigm; aiming to investigate the multiple truths of participants' subjective experience of their world[25]. Grounded Theory (GT) was chosen as it offered a useful framework to collect, analyse and conceptualise interview data to generate explanatory insights into participants' social worlds and processes[26]. This theoretical positioning considered the first researcher's background and previous experiences as a dancer and healthcare professional and allowed for an insider position to be adopted and critically reflected upon throughout the study[27]. The researcher approached her status as dialectical (complex) rather than dichotomous (insider/outsider), appreciating that similarities, like differences, are not conceived as absolute. GT suited the research questions, for it allowed an understanding of processes[28] involved in barriers and enablers to the care of dancers.

Participants

A purposive sample of participants was recruited to ensure detailed and relevant data collection to meet the informational needs of the study[29]. Characteristics sampled included experience of working with dancers within institutions' healthcare teams, having a dancing background, or, if in private practice, experience of treating dancers at different professional stages and of different dance styles. These were sought for their increased exposure and insight into dance culture. Inclusion criteria were MTs (physiotherapists, osteopaths, and chiropractors) with a minimum of 2 years' experience of working with dancers. All participants completed the study.

Recruitment

Participants were recruited via monthly adverts on BAPAM's newsletter and website, as well as One Dance UK Facebook posts. Interested participants contacted the researcher directly and were sent the Participant Information Sheet (PIS) and consent form. A two-week cooling off period was followed for each participant. After receiving signed consent forms, online interviews were booked at a date and time of participants' choice.

Data Generation

An interview guide was developed based on previous research of physical therapists' strategies for dancers' rehabilitation[20], as well as findings of dancers' experiences of manual therapy[30] . Three interviews were piloted in July 2021. Voluntarily recruited peers provided feedback on wording, style of questioning and provision of cues, which was considered to refine the interview guide. Listening to pilot interview recordings further developed the first researcher's interviewing skills ahead of study commencement. Reflective and analytical memo writing and discussion with the

second researcher critically interrogated the first researcher's stance as a subjective active contributor in data generation with participants[28].

Researcher 1 was a female osteopath with no previous experience of conducting research. She holds a bachelor's degree in dance from 2005 but has not worked as a dancer since 2012. Researcher 2 was a male osteopath and qualitative researcher. Eight interviews were conducted over a period of 7 months. Interviews were semi-structured and used open-ended questions to allow for in-depth exploration of participants' perspectives[31]. Participants also asked questions of the researcher, establishing a mutual, conversational relationship in data generation[26]. Interviews took place online, were audio-recorded and lasted between 40 and 80 minutes. Recordings were transcribed verbatim and anonymised solely by researcher 1. Member-checking was sought prior to data analysis to ensure transcripts represented participants' views and kept their anonymity[28]. No participant was re-interviewed.

Data Analysis

After repeated reading of transcripts for immersion in the data, an interpretative process resulted in the generation of codes that sought to provide a portrayal of participants' perspectives. These codes were later compared, renamed and grouped into categories[28]. Data generation and analysis were carried out concurrently to continually compare, contrast, and generate categories in a process known as constant comparative method of analysis[32]. Data analysis came to an end through a process of "theoretical sufficiency", whereby the researchers arrived at a level of abstraction that was sufficient to form a compelling and credible interpretation grounded on the data[33]. Participants' feedback on findings was not sought.

- **Coding**

The researcher followed Birks and Mills'[28] suggestion of initial, intermediate and advanced stages of coding. This involved labelling of phrases and paragraphs, which were later grouped within categories. The technique of using *gerunds* for codes was widely employed in initial coding to unveil processes rather than describe data[32]. Intermediate codes were then questioned, regrouped and diagrammed in memos. Advanced analysis began when intermediate codes started forming relationships amongst themselves and merging into categories, whilst being triangulated and further explored as the researchers' theoretical sensitivity increased[28]. Examples of coding are shown in Tables 1 and 2.

- **Memo Writing**

Analytical memos were written throughout the study to **M**ap activities; **E**xtract meaning; **M**aintain momentum; and **O**pen communication[34]. Reflective memos were used to identify and question the first researcher's assumptions and biases. These involved opposing the idea of treating dancers as athletes, presuming it alienates dancers and hinders the therapeutic alliance. Through reflective memo writing, she remained aware of this bias and endeavoured to avoid leading interviewees while welcoming other interpretations. Memos and diagrams were hand-written in tandem[35] and rewritten and schematised during advanced analysis.

Trustworthiness

Criteria for *Rigour* in qualitative research are arguably different from that of quantitative, with *Trustworthiness* considered a parallel set of criteria[36]. Subsets of trustworthiness are *credibility; transferability; dependability* and *confirmability*. Details of strategies to address trustworthiness are found in Table 3. Transparency was also ensured, allowing the reader to make sense of the co-constructed findings.

- **Ethical Approval**

The study was granted ethical approval from the UCO (University College of Osteopathy) Research and Ethics Committee in June 2021.

Informed Consent and Minimising Harm

Prior to interviews, participants were provided with an information sheet and invited to provide written consent. Introducing each interview, the first researcher reiterated that there were no right or wrong answers; and that participants could choose not to answer any questions and decide to stop the interview without giving a reason, at no detriment to them. Questions were asked in a non-judgemental way and respected participants' values. The researcher endeavoured to build rapport with participants and allow them to set the tone and pace of the interview[32]; as well as to ask questions about the researcher's background. Researchers' emails were available for contact throughout the study.

Anonymity

Participants' identity was kept concealed and all data was anonymised by the researchers. Participants were given a numbered file containing their signed consent form, interview recording and transcript. The files were password-protected and stored in the researcher's computer. Once transcribed, interview recordings were deleted.

Results

Participants

Participants' backgrounds are summarised in Table 4.

Findings

Interviews with participants generated rich data on MTs perspectives of caring for dancers. Data analysis constructed 3 categories which described the range of participants' experiences. Two categories were identified – i. *A Strangled Industry,* and ii. *Be-all End-all Patients* – and found to culminate in a central category: iii. *Beyond Hands-on.*

A Strangled Industry

Pressures inherent to the dance industry were perceived by many participants as a catalyst to dancers' inability to maintain or restore health. These involved time pressures, unsociable working hours, peer competitiveness, job insecurity and financial limitations. Lack of adaptability within the industry seemed to influence clinical presentations and introduce barriers to healthcare of pre-professional and professional dancers.

Time pressures involved following a strict calendar of performances and rehearsals - often controlled by directors - limiting and discouraging access to care:

> *"[…] pressure times of the course, coming up to assessments and agent showcases is when I see my student dancers… I wonder how much of that is pushing themselves that bit harder towards that perfect performance."* (P2)
>
> *"Time of day is a barrier, because they're all in the studio, so they all want after-hours appointments. I used to be more flexible, but now I'm not, because I've still got to write your notes and call a consultant".* (P3)
>
> *"They might not even come to get treatment […] because the control is very high by directors. They have hardly any free time to skip out and see someone".* (P6)

Several participants acknowledged that many dancers cannot afford private healthcare. This limited access and adherence to treatment, and increased expectations patients placed on MTs, presenting a point of frustration and stress. Low-income also seemed to force dancers to sustain multiple jobs, increasing the risk of overload injuries and adversely affecting prognosis:

> *"Very often they will only attend once or twice, […] because they can't afford it. Maybe it's an incomplete course of treatment."* (P2)
>
> *"Dancers like to stockpile multiple injuries and want them all fixed in the same session. I feel like I've treated 5 people sometimes when I've treated them. I find that a barrier and very frustrating. But that's also financial."* (P3)
>
> *"They're* [dancers] *working through the day, doing auditions, rehearsals, classes. But to pay their bills they're working in catering at night, […] if you're trying to get this tendinopathy better, will you achieve that goal?" (P7)*

Risk of injury seemed also exacerbated by precarious working resources and dangerous physical demands. Several participants mentioned unsafe flooring patients had to dance on, and aesthetic choices choreographers made that increased injury risk:

> *"How could you put dancers on their knees moving across the stage in this sequence? Knees are not designed to do that."* (P7)

Participants who treated dancers privately frequently offered discounted rates to improve access to care but felt conflicted and frustrated that their dance-expertise was not financially rewarding. It seemed like a shared experience between participants and their dancer patients, where a culture of low or unpaid work in the arts percolates healthcare:

“The dancer I saw for one hour and did 10 hours' work for… I basically put myself on the minimum wage.” (P3)

“I'm not in a position now where I can work for charity. I almost feel that's what I'm being asked to do.” (P1)

Some participants raised questions on healthcare financing for dance. For example, one participant believed healthcare provision is the responsibility of organisations such as dance schools, companies and manual therapy educational institutions:

“I'm not sure performing artists will be treated well in private practice. I think it's the job of the institutes”. (P7)

Participants who treat dancers privately, particularly osteopaths and chiropractors, also expressed isolation from the industry. They felt unable to communicate with and gain trust from dance institutions; and felt pressured being consulted as a last resort:

“I'm a bit second-handed, arm’s-length from it. They'll refer to a chiropractor when all else has failed.” (P5)

“Dancers were not allowed to seek osteos. Apparently, a lot of them used to but kept it secret.” (P1)

P4 and P6 exemplified that working for dance institutions increased access to care and facilitated desirable multidisciplinary collaborations, which benefitted both dancers and practitioners:

“Because there’s money, we can follow-up. Or we say, you need to see someone else in the team. We need to send you for strength and conditioning. Or you need a bit of relaxation. We’ll have you see the massage therapist.” (P6)

<u>Be-all-End-all Patients</u>

Several participants considered patients' identity as dancers an important part of care. With sense-of-self deeply rooted in physical ability, any pain or injury presents a threat to dancers' identity. This confined existence seemed to manifest clinically as perfectionism, hypervigilance and anxiety:

> *"Your entire identity is here, your entire raison d'être is tied-up in what your body can or can't do."* (P2)

> *"In any other world people can adapt more and there're other options. Whereas it's so be-all-end-all for these guys - it's their everything."* (P4)

Many participants noted that this all-important, embodied dichotomous living results in conflicting pain presentations, which range from hyperawareness to neglect. This presented clinical reasoning and management challenges for some participants:

> *"Dancers are hyperaware of their bodies, which borders on obsessive. The anxiety that comes with that is a huge part of being a dancer. But there's the opposite end of the scale where they're coming up to a performance so they're ignoring everything."* (P2)

> *"Someone feels so many sensations down one side of their body and you're trying to grasp it all, because there might be some relevance, but it might be over-awareness."* (P6)

Some participants observed hypervigilance tendencies in student dancers, whereas professionals seemed to ignore injury for fear of job-loss or having a strong drive to develop within an opportunity-scarce industry. P8 thought dancers in general have a high pain tolerance, which makes them challenging to manage:

> *"[with students] I definitely see over-exaggeration, allodynia, small movement results in massive disability."* (P4)

"It might be a career making or breaking performance, so they will want to push through." (P2)

"They have such high tolerance of pain, they're so thirsty to keep practising and performing, that they ignore injury. I think they are the worst to manage." (P8)

Beyond Hands-on

This central category explored the process of caring for dancers, exemplifying ways in which participants navigated the challenges presented above by using the subcategories of Listening, Validating and Managing (Figure 1). Several participants felt that caring for dancers required engagement beyond – not instead of - their manual therapy skills.

- **Embodying Communication**

In listening and validating dancers' experiences, some participants explored the embodied meaning and context of presentations. P1 and P8 valued acknowledging "out loud" their understanding of dancers' lived experiences from the beginning of the clinical interaction. Exploring patients' narratives was part of P3's clinical reasoning, which encompassed emotional, cognitive and environmental aspects of pain.

"I try engaging with their creative process - what does this piece actually demand of you?" (P2)

"Is it a ligament sprain or were you lifted by someone you hate, who had been mean to you, in the choreography you hate, and now you've got a miserable ribcage? It's not an injury. It's to do with the environment they're working in". (P3)

All participants appreciated that knowing dance terminology helped gain trust from dancers. Some participants thought more important than the terminology was assessing how each dancer moved in the context of their presentation, as it greatly varies between dancers and dance styles. When facing an unknown movement, P8 valued trying it herself to facilitate understanding. Participants without a dance background found that the process of learning the language happened through asking dancers to demonstrate movements as well as watching or taking dance lessons themselves.

> *"It's also the way this person does the movement, not just about knowing the ideal move - you want to see that person doing it."* (P6)
>
> *"Dancers understand they speak a different language and know how to explain and demonstrate."* (P5)
>
> *"I have also taken myself to classes to have the experience of it. Wow, that's how it feels!"* (P3)

In addition to dance-specific terminology, participants often used *felt-sense* language to engage with dancers' physicality and enhance communication. There was a belief that this aligned with how dancers relate to their body while dancing:

> *"When I was dancer, no one ever said to me, can you contract your QL a bit more there please? It was, how did it feel? […] allowing them to share what they're feeling and using that language as your starting point."* (P1)
>
> *"I'm not just telling them what I see. They need to understand that, to feel that."* (P6)

- **Navigating Pain Experiences**

Participants adopted various strategies to deal with the spectrum of dancers' pain experiences. Some participants drew attention away from detail to increase patients'

confidence in their bodies, in an attempt to mitigate hypervigilance. Some participants used pain science to educate patients and encourage self-management, along with valuing counselling as concomitant support:

> *"If I'm ever on the cusp of thinking this joint is a little bit dysfunctional, I think with a dancer I would often skirt over it."* (P1)
>
> *"I help them understand the physiology of pain. I'll say there's no damage involved, and use understanding of pain mechanisms."* (P4)
>
> *"They might need to see the counsellor parallel to injury management. Learn how to cope and integrate pain."* (P6)

Many participants found manual therapy a useful tool to engage with patients' narratives of fine-tuned physicality, when injury did not seem present, but there was a need to address a sense of hyper-embodiment or disembodiment. This involved thorough physical assessments as part of reassuring patients. Some participants also referred to using techniques that they knew had a limited evidence base, as they valued the non-specific aspects of care:

> *"Dancers often say, I know I'm not injured but my leg is not my leg. It doesn't feel right."* (P3)
>
> *"It's not a serious problem […] but it needs to be managed, which is different than saying, oh, it's nothing, don't be silly, go home."* (P7)

In managing tendencies to ignore injury, some participants engaged in co-devising resting plans, which considered dance-specific routines and schedules. P8 shared their own history of perceived self-neglect consequences to gain trust from their dancer patients:

“I usually tell them my story. I kept going with my shoulder being dislocated for one and a half year and when I went to the doctor, it was a lost case. It brings them closer to me.” (P8)

- **Dealing with Psychological Pressures**

All participants acknowledged frequent mental health elements in dancers’ presentations. Many participants felt that engaging with this was out of their scope and favoured focusing on empathetic listening and manual therapy to support wellbeing. P3 uncovered and helped manage a range of psychiatric and safe-guarding issues. P4 and P6 valued referring patients with psychological co-morbidities within dance schools’ multidisciplinary teams.

“I don't feel I'm well qualified in that area beyond my normal listening, reflecting… I want to make them feel supported, but I support them with my manual therapy.” (P2)

“Some people self-harm and we talk about that. Some people have been sexually assaulted and I'm the only person they've told, so we talk about that. A dancer I've been working with - there was an eating disorder - so we focused on that.” (P3)

“If you’re aware they've got depression, explaining to them counselling might be of benefit, [...] and referring to student wellbeing.” (P4)

- **Collaborating and Advocating**

Participants frequently spoke about dancers being extremely goal driven. This included being fit for time-bound auditions and performances. Patients often asked participants whether they could participate in those or not. Some participants dealt

with goal setting by sharing their assessment of potential risks involved, without dominating decisions. Many participants strove to accommodate goals, appreciating that opportunities are scarce and can be life-changing:

> *"My job isn't telling you what you can or can't do. Mine is to help you towards it as much as I can. We've got to come to that decision together."* (P2)
>
> *"You've got to give room for those goals. If I say no […] and my doubt turns out to be unsubstantiated, I've just robbed you of your dream career."* (P1)

Participants valued collaborating with dance teachers, choreographers, parents and other healthcare professionals; and considered it a barrier to care when not available. Many emphasised the need for industry-wide efforts to address all challenges regarding dancers' health, including safety at work, and career and retirement planning:

> *"We need to continue to educate educators."* (P2)
>
> *"If the structure were there to allow the dancer to rest, you wouldn't have that [anxiety]. You would say, your job is safe, go and rest."* (P7)
>
> *"We all have to face it, when do we retire? It's just so very young for a professional dancer." (*P5)

Discussion

This study aimed to gain an understanding of physiotherapists, osteopaths, and chiropractors' perspectives of caring for dancers. Findings highlighted several challenges faced by practitioners and subsequent strategies attempted to address them. These encompassed significant psychosocial aspects relating to dancers' internal world and the dance industry environment. MTs interviewed in this study suggested that caring for dancers demands comprehensive and collaborative approaches, often reaching beyond their manual skills.

Healthcare within the Industry

An important finding of this study was that poor remuneration of dancers presents a barrier to healthcare. According to the performing artists' trade union, wages for dancers in the UK can be as low as £367.20/week. For independent dancers, this payment must last through periods of unemployment in between projects. Non-unionised dancers could earn even less. It is then unsurprising that many dancers struggle to pay for healthcare. Practitioners also observed that sustaining multiple jobs to supplement dance wages further contributes to injury risk and poor prognosis, which is consistent with previous findings of dancers' experiences[37]. This study suggested that MTs who treat dancers in private practice equally experience financial disadvantage due to offering discounted rates for dancers. It presents as frustration and a perception that their dance-expertise is not financially rewarding.

Discussing dancers' affordability seems to require a discussion around who should pay for their healthcare. Free or subsidised specialist healthcare provision for dancers in the UK was identified[1,2,38]. Data on their outreach could not be found, but some seem to primarily help dancers from established companies, who are understood to already have access to on-site clinics. These dancers also benefit from more secure jobs when compared to independent dancers, leaving the latter at increased risk of stress, anxiety, and overload injuries[37], consistent with a finding of this study. Students and fully employed dancers have also shown more positive experiences of clinical care - including trust in practitioners and confidence on management plans - than their self-employed counterparts[21]. Compatible to this study's unearthing, it suggests that access to healthcare through institutions significantly improves dancers' experiences. MTs interviewed also benefitted from working within dance institutions, where they appreciated being part of multidisciplinary teams. Indeed, collaborating with other

HCPs was dancers' most chosen (79%) expectation of practitioners in Haikal et al.'s survey[21] .

Scheduling intensity and constraints in dance was another frequently mentioned environmental barrier to care. The concept of periodisation has consistently shown benefits in preventing injury and optimising performance in sports[39]. It involves a careful planning of training volume, intensity, and time for rest, recovery and treatment. This framework has recently been proposed to dance companies and vocational dance institutions[40], but the extent of its current application and outcomes is unknown. Psychological effects of periodisation in dance have been modestly investigated[41], but could also prove an important enabler to dancers' wellbeing.

This study found that advocating for fair and safe practices in dance sometimes meets resistance in the wider industry. This is consistent with research showing that physical therapists feel that their efforts are often seen as limiting creativity and freedom of artistic staff[42]. It suggests that novel ways of collaborating are needed between all dance stakeholders - dancers, dance teachers, choreographers, dancers' parents, and HCPs – to improve overall care.

Healthcare for the Dancer

Practitioners interviewed in this study showed a deep appreciation of dancers' sense of identity, which reportedly helped establish a therapeutic alliance. This was true for MTs with and without a background in dancing. It matches previous qualitative and quantitative findings that dancers value HCPs who understand the demands of their artistic craft, as well as internal pressures they face[15,43].

<u>Navigating dancers' pain experiences</u>

A significant aspect of dancers' sense-of-self which challenged MTs in this study was dancers' perception and behaviour around pain. MTs often had to decipher and navigate clinical presentations ranging from ignoring pain to being hyper-vigilant to it. Some practitioners in the study believed dancers have high pain thresholds, which seems consistent with findings of trivialisation of pain and injury in various dance genres subcultures[13,44]. Dancers also consider themselves to have increased threshold for pain[22]. An observational study concluded that ballet dancers have higher pain thresholds and tolerance than matched controls in the Cold Pressor Test; but paradoxically, the study highlighted that dancers experienced pain more intensely than controls and that conclusions of dancers' increased pain threshold should be treated with caution[45].

Indeed, this study found that many practitioners observed hypersensitivity to and over-awareness of pain, which would seem inconsistent with a high pain threshold. It suggests the need to further investigate dancers' pain threshold; and crucially, differentiate it from pain tolerance. It can be hypothesised that dancers have high pain tolerance due to exposure, motivation and culturalisation, whilst potentially having low pain threshold, consistent with increased interoception[46]. If this is the case, it would strengthen the argument for using pain science education to help dancers understand their threshold rather than perpetuating a false anecdotal belief. It would also warrant education to avoid pushing through injury, due to a high tolerance of pain, when rest is in fact necessary. Both approaches could also be useful in helping MTs better navigate and address dancers' pain experiences.

Psychologically Informed Practice

Another noteworthy finding was MT's encountering of many psychological elements in dancers' presentations. Significant internal pressures coupled with an unadaptable industry could explain high rates of psychopathology in dancers presenting with musculoskeletal issues, which was 60% in Air's[47] survey (n=153). Even when diagnosable psychopathology seems absent, psychological fatigue and sleep deprivation also affect many dancers' health[48], which this study found to be an important barrier to healthcare. Personality traits such as perfectionism in dancers have also been linked to decreased sense of accomplishment, and physical and emotional burn-out[49]. Importantly, mood and anxiety disorders are also secondary symptoms of Hypermobility Spectrum Disorders, which seem highly prevalent amongst dancers, and should be considered in the thorough management of the person.[50]

Addressing such complex scenarios would seem out of MTs' scope of practice. Whilst some MTs in the study engaged with psychological concerns, several felt unequipped or unwilling to do so. Indeed, a recent qualitative study found that osteopaths feel unprepared to assess and manage psychosocial factors in patient presentations[51]. A promising psychologically informed program suitable for use by osteopaths has been developed and applied in the UK[52]. In combination with manual therapy, it facilitates self-management strategies based on Acceptance and Commitment Therapy for developing psychological flexibility in the context of pain. Cognitive science frameworks of enactivism and active inference suggests a similar multimodal approach to care; whereby manual therapy influences patients' pain perceptions bottom-up, while communication, education, and reassurance change those perceptions top-down[53]. These overarching approaches could meet the demands raised by MTs interviewed in this study. In managing dancers' wellbeing, ecological

and systems' thinking was deemed necessary to address dancers' internal world and facilitate a more adaptable relationship with their demanding industry.

Limitations and Implications for further research

This study was conducted with a small sample of MTs practising in the UK and Europe only, which could limit transferability. The study examined how MTs recall and describe their care of dancers, so other observational studies would contribute to a broader picture of how it plays on in practice. Future research could explore dancers' pain thresholds and the feasibility of differentiating it from pain tolerance. Equally, development and implementation of dance-specific pain science education for all stakeholders would be desirable. Psychologically informed practice training for all HCPs involved in caring for dancers should be researched. Exploring ways to create more adaptability and collaboration within the dance industry using multidisciplinary and systems thinking is indicated.

Conclusion and Implications for Practice

This study aimed to gain an understanding of MT's perspectives of caring for dancers, including communication and treatment approaches. Findings highlighted several challenges faced by practitioners and subsequent strategies attempted to address them. These encompassed significant psychosocial aspects relating to dancers' internal world and the dance industry environment. MTs interviewed in this study suggested that caring for dancers demand comprehensive and collaborative approaches, often reaching beyond their manual skills. Particularly, integrating psychologically informed strategies into manual therapy care would be beneficial. Thorough understanding of pain science and its relevance to each individual should

be pursued by clinicians and dancers. Practitioners should also explore industry-wide collaborative channels to enhance dancers' wellbeing.

References

1. BAPAM. British Association of Performing Arts Medicine. Published 2021. Accessed February 15, 2021. https://www.bapam.org.uk/
2. NIDMS. National Institute of Dance Medicine and Science. Healthcare. Published 2022. Accessed April 2, 2022. https://www.nidms.co.uk/healthcare
3. Laws H. *Fit to Dance 2: Report of the Second National Inquiry into Dancers' Health and Injury in the UK*. Dance UK; 2005.
4. Lederman RJ. Overview of Performing Arts Medicine. In: Lee SH, Morris ML, Nicosia S V, eds. *Perspectives in Performing Arts Medicine Practice: A Multidisciplinary Approach*. Springer International Publishing; 2020:3-11. doi:10.1007/978-3-030-37480-8_1
5. Smith PJ, Gerrie BJ, Varner KE, McCulloch PC, Lintner DM, Harris JD. Incidence and Prevalence of Musculoskeletal Injury in Ballet: A Systematic Review. *Orthop J Sports Med*. 2015;3(7):2325967115592621. doi:10.1177/2325967115592621
6. Van Winden DPAM, Van Rijn RM, Richardson A, Savelsbergh GJP, Oudejans RRD, Stubbe JH. Detailed injury epidemiology in contemporary dance: A 1-year prospective study of 134 students. *BMJ Open Sport Exerc Med*. 2019;5(1). doi:10.1136/bmjsem-2018-000453
7. Bronner S, McBride C, Gill A. Musculoskeletal injuries in professional modern dancers: a prospective cohort study of 15 years. *J Sports Sci*. 2018;36(16):1880-1888. doi:10.1080/02640414.2018.1423860
8. Cahalan R, O'Sullivan K, Purtill H, Bargary N, Ni Bhriain O, O' Sullivan P. Inability to perform due to musculoskeletal pain and injury in elite adult Irish dancers: a prospective investigation of contributing factors. *Physiotherapy*. 2015;101:e193-e194. doi:10.1016/j.physio.2015.03.355
9. Clarke F, Koutedakis Y, Wilson M, Wyon M. Associations between balance ability and dance performance using field balance tests. *Med Probl Perform Art*. 2019;34(3):154-160. doi:10.21091/mppa.2019.3026
10. Shaw JW, Mattiussi AM, Brown DD, Springham M, Pedlar CR, Tallent J. The activity demands and physiological responses observed in professional ballet : A systematic review The activity demands and physiological responses observed in professional ballet : A systematic review. 2021;(September). doi:10.36905/jses.2021.04.04
11. Wainwright SP, Williams C, Turner BS. Varieties of habitus and the embodiment of ballet. *Qualitative Research*. 2006;6(4):535-558. doi:10.1177/1468794106068023
12. Wainwright SP, Williams C, Turner BS. Fractured identities: Injury and the balletic body. *Health N Hav*. 2005;9(1):49-66. doi:10.1177/1363459305048097
13. McEwen K, Young K. Ballet and pain: Reflections on a risk-dance culture. *Qual Res Sport Exerc Health*. 2011;3(2):152-173. doi:10.1080/2159676X.2011.572181
14. Vassallo AJ, Pappas E, Stamatakis E, Hiller CE. Injury Fear, Stigma, and Reporting in Professional Dancers. *Saf Health Work*. 2019;10(3):260-264. doi:10.1016/j.shaw.2019.03.001
15. Air ME, Grierson MJ, Davenport KL, Krabak BJ. Dissecting the doctor-dancer relationship: Health care decision making among American collegiate dancers. *PM and R*. 2014;6(3):241-249. doi:10.1016/j.pmrj.2013.09.001

16. Wang TJ, Russell JA. A tenuous pas de deux: Examining university dancers' access to and satisfaction with healthcare delivery. *Med Probl Perform Art*. 2018;33(2):111-117. doi:10.21091/mppa.2018.2018
17. Air M. Health care seeking behavior and perceptions of the medical profession among pre- and post-retirement age Dutch dancers. *J Dance Med Sci*. 2009;13(2):42-50.
18. Shah S. *Caring for the Dancer: Special Considerations for the Performer and Troupe*. Vol 7.; 2008. http://dancewellness.case.
19. Krasnow D, Thomas M, Lai R. *Communication Between Medical Practitioners and Dancers*.; 2006.
20. Sabo M. Physical therapy rehabilitation strategies for dancers: a qualitative study. *J Dance Med Sci*. 2013;17(1):11-17. doi:10.12678/1089-313X.17.1.11
21. Haikal L, Boissonnault È, Boudier-Revéret M, Dagher JH. Dancers' Perceptions of Accessibility and Quality of the Relationship with Healthcare Professionals in Quebec. In: *Medical Problems of Performing Artists*. Vol 36. Science and Medicine Inc.; 2021:245-262. doi:10.21091/mppa.2021.4028
22. Markula P. (Im)Mobile bodies: Contemporary semi-professional dancers' experiences with injuries. *Int Rev Sociol Sport*. 2015;50(7):840-864. doi:10.1177/1012690213495745
23. Rivera DC, Alexander JL, Nehrenz GM, Fields BJ. Dancers' perceptions of injuries. *Journal of Music and Dance*. 2012;2(1):9-12. doi:10.5897/JMD11.006
24. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007;19(6):349-357. doi:10.1093/intqhc/mzm042
25. Petty NJ, Thomson OP, Stew G. Ready for a paradigm shift? Part 1: Introducing the philosophy of qualitative research. *Man Ther*. 2012;17(4):267-274. doi:10.1016/j.math.2012.03.006
26. Mills J, Bonner A, Francis K. Adopting a constructivist approach to grounded theory: Implications for research design. *Int J Nurs Pract*. 2006;12(1):8-13. doi:10.1111/j.1440-172X.2006.00543.x
27. Unluer S. *Being an Insider Researcher While Conducting Case Study Research*. Vol 17.; 2012. http://www.nova.edu/ssss/QR/QR17/unluer.pdf
28. Birks M, Mills J. *Grounded Theory - A Practical Guide*.; 2015.
29. Coyne IT. Sampling in qualitative research. Purposeful and theoretical sampling; merging or clear boundaries? *J Adv Nurs*. 1997;26(3):623-630. doi:10.1046/j.1365-2648.1997.t01-25-00999.x
30. Pollard-Smith T, Thomson OP. Professional ballet dancers'experience of injury and osteopathic treatment in the UK: A qualitative study. *J Bodyw Mov Ther*. 2017;21(1):148-156. doi:10.1016/j.jbmt.2016.06.009
31. Lofland J. *Analyzing Social Settings: A Guide to Qualitative Observation and Analysis*. Wadsworth/Thomson Learning; 2006.
32. Charmaz K. *Constructing Grounded Theory*. 2nd ed. SAGE Publications Ltd; 2014.
33. Thomson OP, Petty NJ, Scholes J. Grounding osteopathic research - Introducing grounded theory. *International Journal of Osteopathic Medicine*. 2014;17(3):167-186. doi:10.1016/j.ijosm.2013.07.010
34. Birks M, Chapman Y, Francis K. Memoing in qualitative research: Probing data and processes. *Journal of Research in Nursing*. 2008;13(1):68-75. doi:10.1177/1744987107081254

35. Corbin J, Strauss A. Grounded Theory Research: Procedures, Canons, and Evaluative Criteria. *Qual Sociol*. 1990;13(1):1-19.
36. Lincoln YS, Guba EG. But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New Directions for Program Evaluation*. 1986;1986(30):73-84. doi:https://doi.org/10.1002/ev.1427
37. Aujla I, Farrer R. The role of psychological factors in the career of the independent dancer. *Front Psychol*. 2015;6(OCT). doi:10.3389/fpsyg.2015.01688
38. One Dance UK. One Dance UK. Healthier Dancer Programme. Published 2021. Accessed April 2, 2022. https://www.onedanceuk.org/programme/healthier-dancer-programme
39. Mujika I, Halson S, Burke LM, Balagué G, Farrow D. An Integrated, Multifactorial Approach to Periodization for Optimal Performance in Individual and Team Sports. *Int J Sports Physiol Perform*. 2018;13(5):538-561. doi:10.1123/ijspp.2018-0093
40. Matos M. Periodisation and Dance. In: *Scientific Perspectives and Emerging Developments in Dance and the Performing Arts*. ; 2021:237-259. doi:10.4018/978-1-7998-4261-3.ch012
41. Wyon M, Thacker P, Went A. *Psychological Effects of Introducing a Tapering Period during Intensive Rehearsals Prior to Performance in a Dance Company*.; 2002.
42. Kilburn CM, Singh H, Makowski A, Musselman K. Perspectives of Physical Therapists Regarding the Use and Value of Screening Assessments and Preventative Programs for Elite-Level Dancers. *Journal of Dance Medicine & Science*. 2020;24(1):3-11. doi:10.12678/1089-313x.24.1.3
43. Alimena S, Air ME. Trust, satisfaction, and confidence in health care providers among student and professional dancers in France. *Med Probl Perform Art*. 2016;31(3):166-173. doi:10.21091/mppa.2016.3030
44. Lampe J, Borgetto B, Groneberg DA, Wanke EM. Prevalence, localization, perception and management of pain in dance: An overview. *Scand J Pain*. 2018;18(4). doi:10.1515/sjpain-2018-0105
45. Tajet-Foxell B, Rose FD. Pain and pain tolerance in professional ballet dancers. *J Sp Med*. 1995;29(1):31-34. doi:10.1136/bjsm.29.1.31
46. Christensen JF, Gaigg SB, Calvo-Merino B. I can feel my heartbeat: Dancers have increased interoceptive accuracy. *Psychophysiology*. 2018;55(4):e13008. doi:10.1111/psyp.13008
47. Air ME. Psychological distress among dancers seeking outpatient treatment for musculoskeletal injury. *J Dance Med Sci*. 2013;17(3):115-125. doi:10.12678/1089-313x.17.3.115
48. Alimena S, Air ME, Gribbin C, Manejias E. Utilization of Routine Primary Care Services Among Dancers. *J Dance Med Sci*. 2016;20(3):95-102. doi:10.12678/1089-313X.20.3.95
49. Nordin-Bates SM, Raedeke TD, Madigan DJ. Perfectionism, Burnout, and Motivation in Dance: A Replication and Test of the 2×2 Model of Perfectionism. *J Dance Med Sci*. 2017;21(3):115-122. doi:10.12678/1089-313X.21.3.115
50. Chan C, Hopper L, Zhang F, Pacey V, Nicholson LL. The prevalence of generalized and syndromic hypermobility in elite Australian dancers. *Physical Therapy in Sport*. 2018;32:15-21. doi:10.1016/J.PTSP.2018.02.001
51. Formica A, Thomson OP, Esteves JE. 'I just don't have the tools' - Italian osteopaths' attitudes and beliefs about the management of patients with chronic pain: A qualitative study. *International Journal of Osteopathic Medicine*. 2018;27:6-13. doi:10.1016/j.ijosm.2017.11.001

52. Carnes D, Mars T, Plunkett A, Nanke L, Abbey H. A mixed methods evaluation of a third wave cognitive behavioural therapy and osteopathic treatment programme for chronic pain in primary care (OsteoMAP). *International Journal of Osteopathic Medicine*. 2017;24:12-17. doi:10.1016/j.ijosm.2017.03.005
53. Bohlen L, Shaw R, Cerritelli F, Esteves JE. Osteopathy and Mental Health: An Embodied, Predictive, and Interoceptive Framework. *Front Psychol*. 2021;12. doi:10.3389/fpsyg.2021.767005

Table 1. Examples of Initial Coding[28].

Quote	Initial Coding
*"Yes, I know **we**'ve got that coming up next Tuesday, so how are **we** going to manage **our** way through it? Make sure that they know that I understand performance pressures, and can empathise."* (P2)	**Using 1st person pronoun** **Dealing with performance pressure** **Empathising**
*"I told them, I know it's really crap but **let's** figure out how you're gonna earn some money - I knew they had all their work lined up, and now they were gonna lose all their work. But I knew the choreographer, so I phoned the choreographer and said, it's not great news, let's do a zoom call with all of us in it."* (P3)	**Acknowledging financial pressures** **Collaborating with team** **Advocating for patient** **Liaising with producers**

Table 2. Examples of Intermediate and Advanced Coding[28]

Intermediate Coding		Advanced Coding
Codes	**Emerging Category**	**Central Category and Subcategories**
Educating about pain *"I explain the pain mechanisms an why I think there's no damage involved"* (P4) **Validating Catastrophising** *"I would never say a dancer is catastrophising, because I know that many times injury does mean end of career"* (P7)	**Navigating Different Pain Experiences**	**Beyond Hands-on** • Validating • Managing (through education)

Table 3. Strategies used to enhance *Trustworthiness*[36].

Criteria	Strategies used
Credibility • context-specific truth value	Prolonged immersion with data: July 2021 – May 2022; second researcher debriefing; triangulation; negative case analysis; member checking
Transferability • applicability to other contexts or participants	Purposive sampling. Thick descriptions.
Dependability • reliability and consistency	Audit trails and memos
Confirmability • objectivity and neutrality	Reflective journaling: identification of biases and assumptions; and their implication for analysis and results. Transparency: the researcher disclosed to participants and future readers her background in dance, injury and training as an osteopath.

Table 4. Participant's background.

Gender	Years in practice	MT Profession	Background as a dancer	Post-grad training*	Practice Mode**
4 Male 4 Female	6 - 27	1 chiropractor 2 physiotherapists 4 osteopaths 1 physiotherapist and osteopath	4	3	3 Private 3 Institutes 2 Mixed

*Post-graduate training in Dance Medicine and Science or Performing Arts Medicine.

**Private Practice, Dance Institution (educational and/or charitable institution offering free or subsidised care for dancers) or a combination of the two modes.