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Voices from the clinic: a qualitative analysis of physiotherapy strategies in musculoskeletal care for knee osteoarthritis patients

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Abstract

Background Physiotherapy has emerged as an important health strategy to deliver lifestyle, exercise and physical activity for people with knee osteoarthritis. However, little is known about the extent to which physiotherapists adhere to clinical practice guidelines. This study aimed to explore the perspectives and care patterns of physiotherapists in Sydney, Australia on their delivery of knee osteoarthritis care and how this aligns with the 2019 Osteoarthritis Research Society International (OARSI) guidelines.

Methods We invited thirty-three physiotherapists from nine private practices in metropolitan Sydney to partake in a semi-structured interview. The interviews were digitally recorded and transcribed verbatim. The data collected were analysed deductively using content analysis, comparing guidelines to current care patterns, while their perspectives were inductively analysed through thematic analysis.

Results Thirty physiotherapists participated (age range 22–63 years, 17 male and 13 female). Interview responses indicated that most physiotherapists were satisfied with their care of knee osteoarthritis patients. Most physiotherapists delivered "core" guideline-based care of education and land-based exercise. Recommendations of modalities of exercise, including hydrotherapy and manual therapy, were discussed and were perceived to be beneficial despite not being "core" clinical guideline recommendations. Current treatment strategies focussed on disease severity, symptom presentation and/or patient exercise history with little emphasis on education about osteoarthritis pathophysiology and drug-based pain relief. The thematic analysis identified two over-arching themes; (1) capacity to deliver and awareness of evidence-based care and (2) perceived recommendations for future physiotherapy management. Participants identified notable areas of potential service improvement including developing stronger and more effective reimbursement models, increased consult times and improved patient access.

Conclusion The study provided unique insights towards physiotherapists' current usual knee osteoarthritis care and their perceived barriers to delivering guideline-based care. Thus, informing a need for future studies to focus on developing specific and detailed guidelines if physiotherapists are to align more closely to the core guideline-based recommendations.

Trial registration This study was part of a larger study, with the full protocol published and registered at ClinicalTrials (ACTRN12620000188932, ACTRN12620000218998) 19/02/2020).

Keywords Knee osteoarthritis, Physiotherapy, Guideline-based care, Primary care, Physical therapy

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Background

Osteoarthritis (OA) affects 500 million people worldwide, with knee OA being the major cause of pain and disability [1]. OA is responsible for substantial health and societal costs due to the impaired work productivity and burden on healthcare systems [2–7]. The knee joint is the most commonly affected joint globally with 60–80% experiencing pain, muscle weakness and stiffness, affecting an individual's ability to maintain independence [8, 9]. Concomitant psychosocial factors also limit the health-related quality of life [10, 11]. Treatment guidelines such as the 2019 Osteoarthritis Research International Society (OARSI) guidelines have an important role in guiding clinicians to deliver effective treatment and advocacy for access of patients to appropriate care [12].

The OARSI guidelines are segmented into *(1) Core recommendations*: treatments deemed appropriate for the majority and deemed safe for use as adjunct to first- or second-line care. Education regarding OA disease progression and self-management is considered a standard of care to promote optimism and positivity towards treatment for all people with knee OA. The incorporation of structured land-based exercise programs and dietary weight management in combination with exercise are considered effective and safe for all patients with knee OA. *(2) High consensus (1a and 1b) recommendations*: Strategies supported with high quality evidence involving many patients who demonstrated modest benefit over the course of three months. Primarily knee OA patients with no comorbidities are strongly recommended topical non-steroidal anti-inflammatory drugs (NSAIDs) to manage pain symptoms. Additionally, aquatic exercise (hydrotherapy) and self-management programs were recommended based on robust benefits on pain and objective measures of function. However, accessibility issues, financial constraints, and issues with uptake limit the strength of this recommendation. *(3) Strong recommendations against*: Treatments include massage, mobilisation and manipulation, thermotherapy and Kinesio taping/strapping due to the low efficacy and have not been standardised.

A multidisciplinary approach combining exercise, self-management, nutrition and weight-management facilitates preservation of joint structure and function and is recommended as first line treatment to promote long-term symptomatic control [13–15]. Pharmacological treatments are only recommended as an adjunct with topical non-steroidal anti-inflammatory drugs (NSAIDs) if individuals with severe OA require these interventions [12]. Many clinical guidelines for OA management include reference to exercise and lifestyle modifications as an important factor, however, in practice, treatment tends to be biased towards pharmaceutical interventions. Physiotherapy is emerging as a central part of primary care for patients with knee OA shifting away from surgical interventions [16]. The direct access to physiotherapy care is expected to play an even larger role, potentially decreasing medical practitioner's workload and therefore, reducing delays in assessment, management and in turn, decreasing healthcare costs [16, 17].

Despite the potential to perform a pivotal role in the management of OA, previous literature reports that physiotherapists deliver guideline-based care only half of the time to patients with musculoskeletal diseases [18]. The reasons for this under-utilisation of evidence-based practice are multifactorial, including accessibility to resources or organisational culture [19–21]. Improving the uptake of evidence into practice involve studying health professionals' behaviour and targeting specific factors known to influence this behaviour. Previous studies have highlighted that the strategies to target these factors rarely consider the contextual factors including clinician perceptions of care, patient preferences and patient limitations [22]. Thus, the evidence is generalised for a range of health professionals and lack specific detail for physiotherapists on treatment parameters including specific exercise guidelines and modalities of exercise to address patient needs and prioritises [22–24]. In turn, physiotherapists experience physical and emotional priorities when implementing evidence into practice [25, 26]. These challenges can range from logistical complications such as patient funding, time restrictions and availability of relevant training programs [27]. Therefore, there is a lack of understanding of physiotherapy perspectives on their contextual barriers and facilitators of delivering guideline-based care for people with knee OA.

The Australian health care system operates on two levels including: (1) a primary and secondary care level that incurs the first point of contact upon onset of signs and symptoms, (2) a tertiary level involving private and public hospitals to deliver care, primarily for acutely unwell people who cannot safely self-manage their condition at home [28]. Physiotherapists operate at the first level, where individuals in the community present to their general practitioners (GPs) and are managed there, or referred to medical specialists such as rheumatologists or allied health professionals including physiotherapists [28]. Physiotherapists may operate in public or private sectors. Public health care is funded through federal and state governments providing free or subsidised care for specific health needs including post-surgical rehabilitation and injury management [29]. These services are often covered by Medicare or a chronic disease management plan. Whereas private practices are through self-referral or referred by specialists or GPs, usually covered by private health insurance or may incur out-of-pocket

costs. It is important to note that within Australia, the public system stipulates compliance with the knee OA guidelines and standard. The private sector is not beholden to the same level of scrutiny as the public sector, thus, the likelihood that care deviates from guideline recommendations is greater.

As part of a larger study designed to assess the feasibility of guideline-based care for knee OA in private physiotherapy practices across metropolitan Sydney, we conducted semi-structured interviews with physiotherapists treating knee OA in private practice [30]. Specifically, we aimed to determine: (1) Physiotherapists perspectives and care patterns on their delivery of knee OA care, (2) To what extent do these care patterns and perspectives align with the OARSI guidelines.

Methods

Study design

The study employed an explorative qualitative research design with both deductive and inductive approaches to analysis. The study was conducted and reported according to the COREQ-32 item checklist for qualitative studies (Supplementary Data 1). This study was part of a larger study, with the full protocol published and registered on 19/02/2020 at ClinicalTrials (ACTRN12620000188932, ACTRN12620000218998). Ethical approval was obtained by the UNSW HREC (approval number HC180864). All participants provided informed, written consent.

Recruitment

Participants were recruited from nine private practice physiotherapists clinics located across metropolitan Sydney involved in the larger study and were invited to participate in semi-structured interviews. The chosen physiotherapy clinics aimed to represent a diverse geographical location across Sydney to capture an overview on the clinical practice systems in varying socioeconomic backgrounds.

Data collection

An interview guide (Supplementary data 2) was developed by the research term. The interview guide compromised six domains: (1) level of satisfaction with management approach (2) current OA treatment, (3) ideal OA treatment, (4) barriers to implementing the ideal OA treatment, (5) assessment tools, and (6) suggestions for future practice.

Data were collected through semi-structured interviews conducted by a member of the team (RL, a physiotherapist, and a PhD candidate). The researcher had six years of previous clinical experience treating patients with a focus on musculoskeletal outpatients and aged care (UK and Australia). Disclosure of the researcher's standpoints, RL as a physiotherapist interviewing participants facilitates greater understanding and rapport between participants and researcher. This ensured a layer of validity and reliability of the responses received from participants. The researcher had limited experience in qualitative research and received comprehensive training and interview practice prior to data collection by experienced members of the research team (JT, SD and JNa). This training included two mock interviews between RL and private practice physiotherapists not related to the study. The purpose of these mock interviews to ensure the structure of the interview was coherent and the interviews ran smoothly. The researcher had no prior relationship with the study participants. Field notes were made during and after the interview by RL to highlight they key characteristics of comments related to the study's aims. The interviews were digitally recorded and transcribed in verbatim.

Data analysis

Transcribed transcripts were managed through NVivo 12 Plus (QSR International Pty Ltd) [31]. Both deductive and inductive approaches to analysis were conducted. Firstly, we used content analysis to identify the components of care mapped to the OARSI guidelines [32]. Following this, the transcripts were analysed inductively using thematic analysis. Additionally, the measure of care satisfaction was measured using a Likert scale ranging from 'Completely Dissatisfied' to 'Completely Satisfied' allowing for nuanced range of responses to capture varying degrees of satisfaction.

The recorded transcripts were transcribed by a transcription software, "Transcribe Me!" and uploaded to NVivo 12 Plus (QSR International Pty Ltd) software for analysis after $n=6$ transcripts were reviewed for accuracy (RL) by comparing the audio recording to the refined transcription. Both content (alignment to guideline-based care and satisfaction of the delivery of care) and thematic analysis was undertaken by two researchers (JNg, JT). Initially, the coding was inductively analysed by one researcher (JNg) who discussed the initial findings with three other researchers (JT, SD, JNa) where codes were further developed and revised until a framework was agreed upon. Content analysis explicitly investigated the extent to which the reported physiotherapist management aligned with the OARSI evidence-based guidelines. The codes were then deductively categorised into themes that reflected the current assessment and treatment in knee OA management. A further refinement of the content analysis was conducted by JNg who discussed and revised the coding tree with the other researchers (JT, SD, JNa). The themes representing the physiotherapy management was organised into three levels of evidence

extracted from the OARSI guidelines including: (1) core-strong, (2) high consensus – conditional (Level 1B) and, (3) strongly recommended against. This content analysis was converted to counts to highlight the number of physiotherapists reporting each level of care. Thematic analysis with an inductive approach captured the physiotherapists (1) Capacity to deliver and awareness of evidence-based care (2) Perceived recommendations for future physiotherapy management. To ensure rigour in the analysis, creditability was established by the research team being familiar with the management of osteoarthritis. Furthermore, analysis of physiotherapy satisfaction of care was assessed through a closed question with categories.

SD, KM and JT have extensive qualitative research expertise, and JT, KM, JNa, RL and SS have experience in the management of and/or outcome assessments of people with knee OA. The collaboration with a broad range of people in the research who specialise in musculoskeletal diseases and qualitative research strengthens confirmability.

The analysis team (JT, SD, JNa and JNg) met regularly during the analysis to discuss the codes and revision of the coding framework until a consensus was reached. The selection of illustrative quotes for each theme was agreed among all authors.

Results

Participant characteristics

Of the 33 physiotherapists invited, 30 provided written consent to be interviewed. The average duration of the interview was one hour. All except two interviews were conducted in person, with the other two interviews completed over the phone. One physiotherapist was on annual leave, one was no longer employed, and one withdrew for personal reasons. The participating physiotherapists ranged in age from 22 to 63 years old, 17 males and 13 females who had between < 1 to 35 years of experience in the physiotherapy practice. Details of the participants demographics are in Table 1.

Table 1 Private physiotherapist demographics

	Total	Clinic location		
		Low SES	Low-high SES	High SES
No. of Physiotherapists (n)	*n* = 30	*n* = 9	*n* = 7	*n* = 14
Age	36.9 ± 11.1	32.8 ± 7.9	41.6 ± 12.9	37.3 ± 11.6
M : F	17 : 13	6 : 9	3 : 4	7 : 7
Years of Experience*	11.9 ± 9.4	6.5 ± 3.6	16.0 ± 12.1	11.9 ± 9.9

*not all physiotherapists reported their years of experience

Satisfaction of care

Most of the participating physiotherapists reported they were 'somewhat', 'mostly' or 'completely satisfied' with their treatment of their OA patients. Only two physiotherapists said that they were 'neither' to 'somewhat satisfied' and one stated that they were completely dissatisfied with the treatment they provided. This dissatisfaction stemmed from the physiotherapist perspective in the time restraint and cost, limiting their ability to provide sufficient care. In particularly for this physiotherapist who reported feeling 'completely dissatisfied' because "cost is obviously an issue, availability of classes, access to equipment and facilities you'd need. I'd like to do that type of [balance] stuff too but I can't…because of time…" (Male, 63 years old).

Content analysis

The content analysis captured the; (1) core, (2) high consensus and (3) treatment recommended against, levels of evidence and prescription for people with OA. This section is descriptive in what the physiotherapists prescribed in alignment with the OARSI guidelines.

Core-strong recommendations (Table 2)

Education

The most frequently prescribed core treatment discussed education and was utilised across 26 physiotherapists. Of the 26 physiotherapists, 20 provided details on the type of education delivered. The education focused on general information such as, weight loss and diet rather than arthritis pathophysiology, disease trajectory and symptom management. Only eight physiotherapists stated that they delivered arthritis specific education, whereas twelve physiotherapists said they provided general information on weight loss and diet.

Those physiotherapists delivering tailored education highlighted the importance of developing patient self-efficacy by presenting a greater pathological understanding of the disease to encourage uptake of self-management strategies.

> *"Education for anyone with OA, education and their understanding of their condition is very important I would explain to [patients] how the treatments we can do can stop it maybe from getting worse or maybe improve in the short term, make them feel better symptomatically and functionally" (Male, 34 years old).*

Twenty physiotherapists who discussed education said that they aimed to develop patient understanding of their condition to alleviate concerns and misconceptions of management regardless of the type of education.

Table 2 Physiotherapist's current treatment of knee OA linked to OARSI 2019 guidelines of good clinical practice

OARSI guideline recommendation treatments for knee OA 2019*		Current study -Physiotherapists' current practice for patients with knee OA	
Level of recommendation and strength	**Treatment type**	**Number of physios using treatment type**	**Example quotes**
Core - strong	Arthritis Education;	Arthritis ed = 8/30 General ed = 12/30	**Arthritis Education**: *"…our philosophy is that the more person knows about the condition the better they're going to be able to manage it themselves. So talking to them about the nature of the disease, the nature of the progression of the disease, the fact that if you rest you probably going to get – are you going to get worse rather than better. And probably the fallacy of I've got to stop doing things because I've got OA or degenerative joint. Teaching them that's not right and we've got to keep loading them" (Physio 13)* **General Education**: *"Main things I would educate them on is activity to remain active, continue strengthening, walking, weight bearing activities. As well as other strategies such as weight loss and diet…." (Physio 14)* *"It would be education for acute and long-term management. With that education as well, it will be not just looking at sort of the musculoskeletal side. I will address things like weight management, diet management, potential other service that could be helpful like exercise physiologist for the long term…" (Physio 28)* **Contrasting statement**: *"With my 20-something years of experience, it's not about getting them better…it's about listening to their needs. It's about counselling them in what's realistic about their expectations. And then, it's about defining what success is possible. And knowing I can meet those, I'm okay with that…" (Physio 25)*
	Structured Land-Based Exercise Programs (Type 1- strengthening and/or cardio and/or balance training/neuromuscular exercise OR Type 2- Mind-body Exercise including Tai Chi or Yoga) with or without Dietary Weight Management	Land-based ex = 13/30 Mind-body ex = 0/30 Weight management = 0/30 Ex in general 13/30	**Land-based Exercise**: *"…exercise is probably the most important part of that treatment. Increasing their quad strength in a pain free range, which might start out not weight bearing. But then progressing into functional weight bearing exercise…" (Physio 14)* **Land-based exercise**: *"…I will look at muscle length, so obviously, calf length, hamstring…so it might just simple sit to stand type exercises. It might be heel raises. Proprioceptive stuff, even, because depending on the age of the person…I like to do land-based exercises to start with, but it depends on how acute they are, and their size and all that sort of stuff…" (Physio 24)* **Exercise in general**: *"Ultimately, it's [the treatment] also depending on their goals. Personal goals, what they want to do, and we just adjust and be creative in terms of exercise." (Physio 26)* **Contrasting statement**: **"***…It's about physio hands-on for the shorter term…" (Physio 4)*
High consensus -strong (Level 1 A)	Pharmacologic -Topical NSAIDs Non-Pharmacologic -refer to Level 1B	2/30	*"I do tell my patients about… Voltaren 25 milligrams that they can get in their medication…" (Physio 20)*

Table 2 (continued)

OARSI guideline recommendation treatments for knee OA 2019*		Current study -Physiotherapists' current practice for patients with knee OA	
Level of recommendation and strength	**Treatment type**	**Number of physios using treatment type**	**Example quotes**
High consensus -conditional (Level 1B)	Non-Pharmacologic - Aquatic Exercise	6/30	*"Hydrotherapy definitely to unload them or some form of unloading exercise ability, whether it be anything like an anti-gravity device…" (Physio 2)* *"I'm very, very biased with pool, hydro stuff…" (Physio 5)* *"…in the acutely flared-up stage, I'd probably recommend hydro. So I'd get them in the pool just because they don't have that weight bearing issue. They might be able to get some range back in their knee early…" (Physio 7)*
	Non-Pharmacologic -Self-Management Programs	5/30	*"…if they are exercising, even if they are active, modifying their exercise if need be, if they're in an acute flare up of their arthritis, chatting to them about how you can manage exercise load…set them up with a program of exercise if they don't have one already…" (Physio 17)* *"…And then the next component is exercises, so just depending on how acute they are or functional they are at the time, sort of exercises normally targeting quads, hamstrings, gluteals, calf will sort of be prescribed, demonstrated, and then they'll be sent home with like a PDF version of their home exercises online…" (Physio 28)*

Table 2 (continued)

OARSI guideline recommendation treatments for knee OA 2019*		Current study -Physiotherapists' current practice for patients with knee OA	
Level of recommendation and strength	**Treatment type**	**Number of physios using treatment type**	**Example quotes**
Strongly recommend against	Kinesio Taping/Strapping (no efficacy)	4/30	*"Taping is a really good one. Most patients, like 95% of the time, say it feels better with taping, and that would be McConnell method. So that's doing a medial glide and maybe even a tilt as well to correct the position of the patella…" (Physio 9)* *"…Someone with knee arthritis might also have patella femoral joint symptoms or fat pad impingement. So you may have to try settling that down with a bit of taping and/or manual therapy around the patella around the [knee] bend. And then sometimes, they tighten their calves and their gluteals. So, you're doing some soft tissue work." (Physio 21)*
	Massage (lack of evidence)	Soft tissue release** = 23/30	*"Firstly, with me, I do soft tissue massage, quite a bit of that. That's the way I was taught 100 years ago. We do just basic soft tissue massage, and then mobilising patellofemoral joint, gapping, passive range-of-motion stuff, traction with inflection and extension, gapping at different angles and then stretching…" (Physio 20)* **Contrasting statement**: *"I try not to get too involved with hands on treatment because it's only going to be short-term, and it's not going to self-empower them." (Physio 15)*
	Realigning Patellofemoral Brace (no efficacy, low quality evidence) Soft Braces/Knee Sleeves (low quality evidence)	4/30	*"There's some OA unloading braces, but they're generally sort of six, seven hundred dollars plus. So I've prescribed them to a few quite young OA sufferers. They seem to swear by it…" (Physio 3)* *"…the bracing is more a matter of their budget and it's just dependent if they want to go that route. Some people don't like tape so that is an option for them but then they do have to pay for the brace they're buying…" (Physio 21)*
	Thermotherapy (cold or hot) (low quality evidence) Low quality evidence, implausible biological mechanism	5/30	*"They may be a little sore and the ultrasound can settle that down for them…I might use ice, certainly if it's hot, I'll be using ice to cool it down…" (Physio 16)* *"I do tell my patients about hot packs, cold packs…" (Physio 20)*
	Electromagnetic Therapy (Low quality evidence, implausible biological mechanism) Electrical Stimulation (Low quality evidence from trials with very small sample sizes and short follow-up)	3/30	*"…my treatment would be possibly some electrotherapy if it's hot and swollen…" (Physio 16)*

*Only includes the guideline types that matched the physiotherapists current treatment, ** Soft tissue release: Manual therapy including soft tissue mobilisation and myofascial release

"I usually try get an idea of what their thoughts and what their beliefs and ideas are around osteoarthritis. What they believe is their main problem, their focus, and their function..." (Female, 22 years old).

Exercise

An adjunct to education, thirteen out of thirty physiotherapists reported exercise prescription was tailored, focusing on symptom management and functionality. The exercises focused on "…targeting the quads, hamstrings, gluteal and calf…" (Female, 26 years old) using weight bearing exercises or equipment, aligning with the OARSI recommendations to manage pain and function symptoms. Whereas another thirteen physiotherapists delivered general exercise programs focusing on modifying activities of daily living. The difference in the physiotherapists delivery of exercise may be due to the differences in symptomatic presentations i.e. an individual's functional independence. It is important to consider that we did not provide a follow up question on what types of exercises, medium or mode delivery, and therefore, we cannot conclude whether the physiotherapists perceived these general exercise programs as self-management or treatment.

High Consensus (1a and 1b) recommendations

Aquatic exercise (hydrotherapy) was prescribed by six physiotherapists and five stated using self-management programs. While this mode of exercise is not a core OARSI recommendation, the physiotherapists prescribing hydrotherapy indicated they did so to alleviate severe functional symptoms such as inflammation in the joint, weight-bearing issues and/or sore joints. In which aligns with the exceptions the OARSI outlines as acceptable for use.

"Well if they're doing lots of impact loading...you try and orient them to more close chains initially...with slightly less weight-bearing, like pool type of stuff... they might be able to get some range back in their knee early..." (Male, 29 years old).

Additionally, physiotherapists reported prioritising patient preferences, goals and functional presentation, which influenced their prescription of aquatic based exercise opposed to the core recommendation of structured land-based exercise. The shift in priority from clinical guidelines to tailoring to patient needs may be due to the variability of patients, reflective of their priorities such as ensuring patients have a shift in mentality to increase uptake of healthy behaviours.

"Everyone's got different goals, different agendas, which makes it hard. And then also the fact that they're in house in very hard – you kind of lose that momentum...putting the patient first will be a way to see if you're getting any real change..." (Female, 26 years old).

The value of patient uptake of self-management tools was identified by eighteen physiotherapists. However, only five physiotherapists reported that they delivered these programs to patients. The physiotherapists who reported use of self-management interventions such as providing patients with a diet diary highlighted the long-term management of their condition, proving self-management to be beneficial to patients. The limited amount of private practice physiotherapists delivering self-management may be due to the varying definitions of the term "self-management'. The physiotherapists may perceive that prescribed or advice for home-based exercises is not a form of self-management, therefore, did not explicitly say that they provide self-management interventions.

"In our clinic, our philosophy is that the more person knows about the condition the better they're going to be able to manage it themselves... if people are controlling their weight... they're controlling their lifestyle." (Male, 51 years old).

However, one physiotherapist believed that long-term effects of OA management require greater supervision for an individual to understand exactly how to manage their condition. This poses as a barrier to self-management due to physiotherapists reported lack of time to deliver enough supervised care.

"If you want a long-term effect with osteoarthritis, you've got to have enough supervision of an exercise program to start with, so that the person understands exactly how to manage it..." (Male, 51 years old).

Treatment strategies strongly recommended against

Manual therapy was reported by 23 physiotherapists consisting of massages to improve joint mobility and reduce inflammatory symptoms that restrict movement in their knee OA patients. Such high usage of manual therapy may be due to patient expectations in private practice, pressuring physiotherapists to deliver 'hands on' care. Some private physiotherapists also adopted traditional perceptions of OA to be "bone-on-bone" *(Male, 34 years old)* influencing the uptake of such treatment strategy.

"I generally will do some soft tissue manual therapy and generally some joint mobilisations, depending on what joint's affected and how I think that will improve symptoms." (Female, 27 years old).

However, one physiotherapist reported that they "*try not to get too involved with hands on treatment because it's only going to be short-term, and it's not going to self-empower them.*" *(Male, 34 years old).*

Other strategies were used by seven physiotherapists to alleviate knee pain and assist with activities of daily living provided temporary relief such as '*kinesio*' taping and patellofemoral braces. The reported benefits of taping included:

> *"I like to often use some supportive treatment like a tape…any sort of tape that gives a bit of proprioception…It has a value in terms of pain modification." (Male, 28 years old).*

Whilst five other physiotherapists mentioned thermotherapy (heat and cold/ice) by either prescribing or using heat/ice packs and patches, to manage pain symptoms related to their knee OA. In conjunction, three physiotherapists reported that they use electromagnetic therapy or electrical stimulation to improve patients with low range of motion. However, it is unclear whether these treatments were routinely conducted or presented on a case-by-case basis.

Thematic analysis

Themes relating to physiotherapists perceptions of care

There were three overarching themes identified from the inductive analysis, including ideal treatment and barriers to implementation as well as suggestions to improve care. Sub-themes revealed the specific issues including accessibility to care, limited time or various modalities of care, as shown in Table 3. These themes highlight how physiotherapists consider the importance of resources and collaboration with multiple health professionals to better deliver evidence-based practice.

The ideal treatment and barriers to implementing better OA care (Table 3)

Time scarcity in consultations

Majority of physiotherapists (26/30) felt a need to increase consultation times and frequency to allow for education and exercise to be sufficiently delivered to their knee OA patients. Physiotherapists reported that having more sessions provided greater benefits in empowering patients to self-manage and partake in positive healthy behaviours.

> *"We've only got 20 minutes to do all the stuff in the short amount of time we do have, so yeah, time is definitely an issue…you can go through a few exercises with people, but you're still limited to a proper session plus treatment…" (Female, 30 years old).*

> *"…if I had more time, I could probably really try and get them to reflect and see if they actually understand [OA]…" (Female, 26 years old).*

With the reported desire to have increased consultation times, these physiotherapists reported a lack of time to effectively assess patients, deliver education and prescribe exercise as it is "the biggest limitation…in this clinic" (Male, 32 years old).

Accessibility to various modes of exercise limited by financial constraints and costs

There were seven physiotherapists who described the importance of having access to various equipment such as stationary bikes or pools to ensure that appropriate loading was delivered. The access to these resources was felt to be beneficial for patients:

> *"…if they've good access to a hydrotherapy pool, or just a heated pool would be good…to take the edge off the pain that they may experience, to allow them to exercise a bit more freely…" (Male, 31 years old).*

In conjunction with hydrotherapy, 'alter G machines' (anti-gravity assistive device) were also considered desirable options to assist with range of motion and with "assisted walking" (Male, 31 years old). They were considered a "good, graded approach…work[ing] up to 100% function…" (Male, 33 years old).

However, twenty-two physiotherapists highlighted the financial constraints and cost of accessing these recommended services limit their ability to deliver proper knee OA treatment. Physiotherapists identified the financial constraint of managing patient care by providing the equipment in conjunction with patient cost in paying for the services.

> *"…patient access and finances…limits a lot of people from doing things…" (Female, 27 years old).*
> *"People will do things when it's easy to do things… finances, time, location. The more barriers you create to people exercising or loading the less inclined they actually are to uptake anything, exercise or even their daily life." (Male, 51 years old).*

Patient personal preferences to the type of care clashes with physiotherapy care

Regardless of the type of education that was delivered, physiotherapists primary goal reported by five physiotherapists that they wanted patients to understand their condition and the treatment options. Often however, patient preferences for the type of care adds a layer of

Table 3 Physiotherapists perceptions of ideal treatment options for patients with knee osteoarthritis and the perceived barriers to implementation

Ideal treatment options for better OA care
Time scarcity in consultations (26/30)
"…in terms of frequency of treatment, I'd probably want to see them at least twice a week to start with. Maybe two or three times a week for a three-to-four week period. It depends on how severe their problem is. And then it might be once a fortnight, then once a month, but I'd probably want to manage them over a six-month period…" (Physio 2)
"I think probably my education could always be better…I think if I had more time, I could probably really try and get them to reflect and see if they actually understand what I've explained to them because, obviously, we're in a half an hour session…" (Physio 28)
"More often than not these people tend to be working. Then they're usually at a point where they are working these sort of things like that. So it tends to be more like access for their ability to come into the clinic, things like that…" (Physio 1)
"I: So what would prevent you at the moment from being able to do that? Is that number of patients? Is it number of staff? Time? *P*: Yeah. I think the biggest limitation for us in this clinic is time." (Physio 6)
Accessibility to various modes of exercise (7/30) limited by financial constraints and costs (22/30)
"…in the real world I'd want to have, obviously, some combination of electrotherapy…the Game Ready would be something I'd definitely use. The ice compression or the heat compression. A combination of both would be nice. Hydrotherapy definitely to unload them or some form of unloading exercise ability, whether it be anything like an anti-gravity device." (Physio 2)
"And other services that we don't have access to necessarily might be like hydrotherapy or other equipment, such as Alter gravity machine…I just think maybe if they could get walking on that and that's a good graded approach if they start at 50% and then you work it up to 100%…" (Physio 14)
"I: What would prevent you or enable you and your team to be able to do the perfect treatment? Or do you feel that you are able to, at the moment? P: .it's patient access and finances…I think that limits a lot of people from doing things…If everyone could see the EP for one-on-one supervised exercise, it'd be great, but not everyone can…" (Physio 10)
"I guess from a cost point of view, as well I don't feel it's right to be throwing on all of these things to the patient all at once saying that they need to do this…" (Physio 17)
Patient personal preferences to the type of care clashes physiotherapy care (14/30)
"…If they have exercised when they were younger and they kind of get the idea of technique…then great. They can self monitor. But if you've got someone who's never done any exercise, and you're setting them up with a program, I think that's where failure can occur because they could make themselves sorer or more pain…they don't want to do it because it's making them worse…" (Physio 12)
"…my experience and my limited training knowledge, I don't think there's much else that works for them…if it really is osteoarthritis and their kinetic chain isn't needing help elsewhere, I would offer them or ask them whether they go to a gym or anything or what their sport is and what they love doing. So that's important to try and get them back to what they love doing, anyway, because it's more likely that they'll keep it up." (Physio 16)
"…I'm thinking about osteoarthritis sort of more your older, middle-aged to elderly population. So for them, it'll depending on what their goals are, what sports they want to play, and based on that, but exercise would be my go through strength." (Physio 27)
"…patient adherence to physio. So whether or not they truly believe that a 12 week program will make a huge difference…so patient beliefs and expectations are a barrier, especially if they've been told they need a knee replacement. So their surgical preference or beliefs…" (Physio 14)
"You get both extremes. You get people that will see you for months and some people that will see you for two sessions, and then as soon as they feel like they're getting through most of their daily tasks, they'll stop seeing you…you get them back on their feet for a couple of months and they come back in couple of months because they're sore again…" (Physio 10)
"I: So was there anything that would prevent you from being able to do that, at the moment, in this setting?
P:…we're a little bit siloed in the clinic. And so we're trying to develop what works with other health professionals around the area. Because I think everyone's got different goals, different agendas, which makes it hard." (Physio 28)
Implementation of group-based exercise to drive social facilitation and motivation (7/30)
"…I think a group setting would be good because you're educating people multiple times a week. It's more cost effective because they're paying less because there's more people part of that class, etc…" (Physio 6)
"The one thing we've tossed up here as well is running classes, and I've kind of alluded to that, whether the classes are run here in a clinic like this, or having specific knee OA classes…it can be everyone's got their program and they come in for an hour or an hour and a half and they run through their exercises with a physio or an exercise physiologist doing, overseeing it all and progressing them through that way." (Physio 11)
Lack of access to local facilities creating barriers to exercising (7/30)
"It's location. People will do things when it's easy to do things. So the more barriers you create to people exercising or loading, the more that will get in the road. For example, to go into a pool programme you've got to go to the pool. You've got to put swimmers on. You've got to get there. You've got to find parking. You've got to do all that sort of stuff…" (Physio 13)
"it's facilities as well…you do need to have some sort of basic facilities in your practice where you can start to manage these people…" (Physio 23)
Misconceptions of OA care from health providers leading to fear avoidant behaviours. (10/30)
"The interesting thing is, and you will have come across this, there's a market out there that tell you different things as well. So you're competing with a clinician down the road, who may not be a physio or may not be evidence-based, that says "Oh yeah, I'm going to manipulate your knee, or whatever, and you're going to get results in…" (Physio 13)

consideration for physiotherapist care, posing a challenge to delivering evidence-based care. The details regarding the exact preferences are unspecified, but rather spoken more broadly focusing on their expectations for care and requiring private physiotherapists to be "hands on".

"...some patients do have this sense of where they want to come in and someone to fix them. But it comes down to the patients' mentality...they've got to be able to do the home exercise program. They have got to be willing to work with the activity modifications...then you get patients that will come and go..." (Female, 27 years old).

Implementation of group-based exercise to drive social facilitation and motivation

Group-based activities was highlighted by seven out of thirty physiotherapists to provide patients with cost-effective, better quality of care and socially facilitate patients to improve their understanding of knee OA.

> *"...we know that exercise obviously is the thing that makes the biggest difference in terms of everything else in isolation doesn't work, but exercise in isolation works great, and everything as an adjunct is fantastic... I would love to have a three-times-a-week workshop where people with osteoarthritis come in, and they do a group exercise component..." (Male, 32 years old).*

However, the physiotherapists were frustrated that group exercise could not be facilitated practice because of the lack of local facilities such as clinical spaces to run these group sessions.

Misconceptions of OA care from health providers leading to fear avoidant behaviours

Several physiotherapists reported that patients often have misconceptions about their health. These misconceptions often stem from conversations with other health professionals along their care journey. They described the difficulty in alleviating these concerns to drive participation in treatment, because "*you're competing with a clinician down the road, who may not be a physio or may not be evidence-based*" *(Male, 51 years old).*

> *"Because some could come in with just medial compartment syndrome– or osteoarthritis in the medial compartment, but the doctor's told them they've got arthritis. Their knee's gone. They need surgery. They need a knee replacement. But they're 56, and they don't need a knee replacement..." (Female, 27 years old).*

Suggestions to improve physiotherapy care (Table 4)

Collaboration with multidisciplinary teams including exercise physiologists, podiatrists, dietitians, psychologists and GPs to streamline care

The benefits of having a multidisciplinary team, in particular with exercise physiologists was reported by twenty physiotherapists as *"... most physio practices have about 30 minutes...you're still limited to a proper session plus treatment. So, when they see an exercise physiologist, they've got the 45 minutes or the 60 minutes where it's just full-on gym program and they go through everything," (Female, 30 years old).*

Table 4 Illustrative quotes of physiotherapists suggestions to improve care in knee osteoarthritis patients

Suggestions to improve physiotherapy care in knee osteoarthritis patients
Collaboration with multidisciplinary teams including EPs, podiatrists, dietitians, psychologists and GPs to streamline care (20/30)
"…I think that a big gap in all aspects of healthcare, all medical healthcare, is that we all understand that we have to eat healthy or we should eat healthy and exercise…simply modifying their diet, modifying the nutrition, so bringing on or teaming up with some nutritionists and dieticians and things like that to help educate us as well as educate patients on why it is that their body is choosing…" (Physio 6)
"I think dietitians are super important because I think a lot of them do have a nutritional aspect to it…I think that contributes massively and then it's kind of that vicious cycle of they're overweight so then they don't want to exercise because they're in pain, so that kind of cycle…I think kind of psychological side as well, whether they do need kind of counselling way or cognitive behavioural therapy that direction in a perfect world… and then their GP on their side as well rather than kind of pushing them down towards surgery, giving them the option of exercise physiology or physiotherapy…" (Physio 12)
"Throughout that process, it's monitoring their program, progressing their exercises, keep going with the education, like answering any question of theirs, and then potentially directing them to other sources, especially within here, like possible an exercise physiologist or a PT, or a nutritionist if their needs aren't really being met within the confines of this practice." (Physio 22)
Encouraging medical practitioners on prescribing or recommending conservative management to OA patients (15/30)
"I think it's maybe, surgeons and doctors might need to be better educated on what people can do for it. On what physios can do more than what we – I think we feel like we can do a lot more and I feel like the APA's been trying a lot harder to get all that type of stuff out." (Physio 8)
"…I think GPs have a general idea on what we do. I don't think they have a specific idea on all the different tests that we do. So some education to GPs might be useful. And then also, I suppose getting to understand the perceptions of people that need to go further on and see a specialist and those that can be managed conservatively…" (Physio 23)
Increased funding for OA patients to have more physiotherapy sessions to cover detailed education and build confidence for self-management (6/30)
"Some people may have difficulty with getting equipment in the OT sense, from occupational therapy. I think that should be well-funded…it's very important for independence if they have a higher chair or whatever form of chair that's going to help them get up… you could argue for more Medicare sessions maybe? Rather than 5, maybe 10?" (Physio 15)
"So further education provided to private practice physios would be beneficial." (Physio 14)
Upskilling physiotherapists need to be practical and hands on (5/30)
"So I think probably running through some key scientific principles, renewal of information regarding key scientific principles with respect of OA, how it relates to RA, and other arthritic conditions…some of the science and review of science information, and how we might be able to integrate that into our clinical practice would be good…it's often a mix between science and clinical practice in respect of what knowledge is out there now…" (Physio 2)
"…education is always going to help, like going more in-services and things. Problem with them, it's just about finding an appropriate level of education for health professionals. I find a lot of the education that's available is really aimed at new grads, and it's very basic, and health professionals, especially ones with more experience, don't really want to get told what a new grad needs to be told…We want education that we're going to actually find useful and not waste our time." (Physio 10)
Publicly accessible resources to evidence-based interventions (3/30)
"There's only so much physio can do. And I think we're at a point where we are reaching – where we're plateauing in terms of there's only so much medicine, sort of research out there to improve it because…osteoarthritis can't be cured… it should be easier to be accessed. So that's how it can be improved for the general public." (Physio 1)
"I: So having information about guidelines or some sessions on kind of [house deliver?] education, those type of things, or is there anything else that you might think might help you to be able to do that?
P: …Yeah if there was something you could give them to sort of explain arthritis, they can sort of read it on their own, that would be good…" (Physio 7)

However, when asked if physiotherapists would involve anyone else in care, one physiotherapist did not agree with the multidisciplinary care, rather, preferred to work independently with the patient.

"Not really. The only thing, I hesitate with that because if pain is become so bad that they don't want to move and that they're very de-conditioned…" (Female, 40 years old).

Encouraging medical practitioners on prescribing or recommending conservative management to OA patients

Expanding from the barrier of physiotherapy delivery of care, half of the physiotherapists suggested to upskill the medical education to deprescribe *'unnecessary'* medication. This may pose a challenge as the current knee OA guidelines provide a greater focus on pharmacological recommendations, with a lack of specific advice for lifestyle interventions. This may impose medical practitioners to feel less confident to recommend conservative management to OA patients.

"I think there's a big sort of epidemic at the moment with GPs just referring medication for the sake of referring medication…doctors' kind of just put them on meds because it's arthritis…more than physios [we] need to educate doctors to improve the benefit of osteoarthritis care…" (Female, 27 years old).

There were mixed responses on whether general practitioners required greater encouragement from the physiotherapists. Five physiotherapists suggested a better improvement in physiotherapy upskilling workshops or education to deliver better care. The upskilling in physiotherapy care, particularly, in the delivery of education, may be a solution to provide patients a better understanding of the conservative strategies if guidelines remain pharmacologically focused.

"I find a lot of the education that's available is really aimed at new grads, and it's very basic…We want education that we're going to actually find useful and not waste our time." (Female, 27 years old).

Increased funding for OA patients to have more physiotherapy sessions to cover detailed education and build confidence for self-management

As majority of the physiotherapists reported to have limited time to deliver care. The desire for increased funding was demonstrated in six physiotherapists suggested to increase the funding of knee OA patients to have more sessions privately funded or via Medicare (national healthcare insurance scheme that provides subsided care for Australians) and access to other health care services without the financial burden [33]. They thought that this is important to cover education, build rapport and confidence for patients to independently manage the condition.

"more awareness of what patients can access… Whether they just get an EPC (enhanced primary care) stay and plan for five sessions…but what are their options after that because five sessions in one year might not be enough to make a difference…" (Male, 34 years old).

Discussion

Our findings suggest that, except for exercise prescription and delivery of general education, private practice physiotherapists are delivering care methods that are partially align with the clinical guideline recommendations. Previous studies exploring the private practice physiotherapy management of knee OA also highlighted poor integration of guideline-based care due to challenges in patient priority, financial constraints and time scarcity [18, 22, 34].

The current literature highlights that exercise therapy produces statistically superior and clinically significant improvements in pain compared to education alone [35–37]. Consistent with the clinical care standard proposed by the Australia Commission on Safety and Quality in Health Care, and the OARSI guidelines the majority of private physiotherapists prescribed land-based exercise and education; which ranged from OA pathophysiology and symptom management to general advice on lifestyle behaviours and nutrition [12, 38]. The physiotherapists identified that patient preferences, time and accessibility to healthcare services limit guideline-based care [39]. The emergent barriers confirm the findings of previous qualitative literature from both patient and medical professionals [40, 41]. Some physiotherapists reported that strategies such as hydrotherapy (a high consensus recommendation) alleviated pain symptoms for patients who could not weight bear. In which closely aligns with the OARSI guidelines as this strategy is only recommended dependent on the fragility of patients and their functional capacity [12, 42]. While strategies like hydrotherapy and self-management are supported by modest evidence showing the robust benefits on pain and function; issues of accessibility, financial burdens and uptake impose greater challenge in managing the condition [12, 43, 44].

Private practice physiotherapists tend to provide manual therapy and preferred to use biomechanical interventions such as bracing and thermotherapy. This is likely due to the setting of private practice where there is a preconception for private physiotherapists to be 'hands-on' [22, 45, 46]. Some physiotherapists reported that delivering non-evidence-based care such as using manual therapy and/or thermotherapy and bracing preserves the therapeutic alliance to respect patient needs [22]. This may stem from patients' belief that their joint is 'bone on bone' and OA is 'wear and tear', ultimately,

believing that exercise will exasperate pain and massage therapy will provide effective pain relief [47, 48]. This disparity between patient-clinician conflict of priority and the OARSI guidelines that has resulted in a policy push to 'co-produce' research due to the lack of considerable patient variability in symptoms and guidance conservative management for health professionals [49–51]. Some physiotherapists used manual therapy as an adjunct to exercise. It is unclear on what portion of the physiotherapy session was devoted to manual therapy or passive management by the current physiotherapists. It is important for private physiotherapists however, to consider the 'opportunity cost' of manual therapy and ensure it does not detract from essential time for exercise and education [18, 30, 46].

Notably, the guidelines fail to consider patient variability in symptoms and biological response to treatments and the lack of information on conservative management, hinders physiotherapists from delivering 'evidence-based' care. This may explain the use of strategies that are not recommended including manual therapy due to the lack of tailored specific lifestyle and exercise guidelines such as including frequency, duration and exercise mode for patients [42]. Our results emphasise the lack of specificity in existing guidelines as the private physiotherapists highlighted the need for collaboration with multidisciplinary care such as exercise physiologists, podiatrists, dietitians and GPs to assist in streamlining care. The private physiotherapists emphasise to ensure that there is opportunity for conservative management and pharmacological management to ensure best practice. However, the ability to deliver such strategy is inhibited because of the lack of time and funding [52–54]. This is consistent with previous literature highlighting the complexity of time management in consultation times, to prioritise patient funding, access to resources and functional capacity [25, 55]. Our findings suggest implementation of group exercises to provide better quality and cost-effective care for private practice patients. However, in Australia, Medicare does not cover group-based exercise for OA. While there are group programs such as the GLA: D Program which is a 6 week program consisting of 12 exercise and 2 education classes, that are becoming more readily available, however, implementing such interventions into the health system requires time and funding [56]. This finding may provide opportunity for a health system reform or highlight the inherent need for more specific lifestyle and exercise components within knee OA guidelines to support health professionals. Future research should aim to understand how health professionals can best collaborate to develop more specific guidelines to cater to both patient and clinician needs.

A strength of this study was the qualitative approach, which allowed us to align the current OARSI guidelines to the existing treatment of knee OA provided by physiotherapists through content analysis. We explored diversity in experiences as we interviewed a range of participants, including males and females with varying ages and clinical experience, and geographical location across Sydney. Our study also has limitations. Our findings relate to the Australian health system, meaning that when contemplating generalisability, local health services and systems need to be considered. Additionally, the interviews may not garner all the information around private practice physiotherapy treatment and their perspectives (including body language, tone of voice and patient interpretation/misconceptions). In conjunction, the relatively small sample size from this study may not represent all physiotherapists working in this area or specialising in OA care.

Conclusion

This study has indicated that physiotherapeutic management in private practice, beyond prescription of exercise and education, current care patterns partially align with the OARSI guidelines. Physiotherapists identified barriers to implementing their ideal treatment and represented the dissonances in guidelines to practical experiences. A combination of these barriers, prioritising clinician judgement of individual OA disease progression and patient preferences could explain why physiotherapists only partially align with the OARSI guideline-based management strategies. The data provided useful insight into the nature of guideline-based care to address the needs of private practice clinicians, however, it cannot be generalised to the public sector. Guidelines should be tailored with consideration of patient and of allied health professional factors. This will inform the future implementation strategies and consideration of guidelines to develop more specific methods of treatment guided by widely endorsed governing bodies.

Abbreviations

GPs	General Practitioners
NSAIDs	non-steroidal anti-inflammatory drugs
OA	Osteoarthritis
OARSI	Osteoarthritis Research Society International

Supplementary Information

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Supplementary Material 1.

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Authors' contributions
JL, JNa, SD, JT, KM and SS were involved in designing the study. RL collected the data and conducted a preliminary overview of the data. JT and JNg analysed the data, and discussed with JNa and SD. All authors contributed to drafts of the manuscript and read and approved the final manuscript.

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

Declarations

Ethics approval and consent to participate
The study was approved by the University of New South Wales Human Ethics Committee (approval number HC180864). All participants provided informed written consent.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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