



Understanding the management of osteoarthritis: A qualitative study of GPs and orthopaedic surgeons in Tasmania, Australia

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ABSTRACT

Objective: Using a qualitative design this study aimed to 1) explore the attitudes towards and understanding of osteoarthritis (OA) held by Tasmanian general practitioners (GPs) and orthopaedic surgeons, 2) gain a deeper understanding of conservative and surgical management and 3) identify key barriers and challenges.

Design: Purposive sampling was used to recruit 17 GPs and 10 surgeons from Tasmania, Australia. Semi-structured interviews were audio-recorded, transcribed, coded, and thematically analysed to document understanding of OA, management and treatment decision making.

Results: GPs and surgeons had a shared understanding of the cause and management of OA which aligned well with evidence-based best practice. Most GPs acknowledged that severity of disease on an X-Ray does not correlate well with symptoms, although some GPs reported always using imaging to support their diagnosis. Conservative management was highly supported by all interviewees, focussing on exercise and/or physiotherapy. Key treatment barriers included managing poor patient understanding of OA, unrealistic expectations for treatment, lack of patient motivation and scepticism towards exercise, and cost and accessibility of conservative treatment options. Surgery was considered a suitable option when conservative management options had been exhausted.

Conclusion: This study uniquely interviewed GPs and surgeons from the same population, capturing two crucial areas of OA management. Some key barriers to treatment were identified and options for improving treatment include creating opportunities for increased patient education about OA, enhanced accessibility to OA conservative management programs along with improved reimbursement models supporting conservative management as first-line OA treatment.

1. Introduction

Osteoarthritis (OA) is a highly prevalent, painful, and costly condition that affects over 2.2 million Australians [1]. It is the main reason for joint replacement surgery with 117,892 knee and hip replacement procedures performed in Australian hospitals during 2019 [2]. OA is one of the most prevalent chronic conditions managed by general practitioners (GPs) and the leading cause of referral to an orthopaedic surgeon [3].

The Australian healthcare system has both publicly and privately funded sectors. The publicly funded Medicare Benefits Scheme (MBS) fully or partly covers treatments and services provided by health

practitioners. GPs act as gatekeepers to government-subsidized health care from other medical specialists. They can refer to allied health professionals using a Chronic Disease Management Plan, which funds up to 5 visits per year. Within the publicly funded hospital system, elective surgery is available with no fee to the patient, however there may be long wait times for surgery. Patients can also access surgery, often more quickly, through the private hospital system which is funded partially by Medicare, private health insurance and/or out-of-pocket costs to the patient.

Current guidelines [4–6] for OA recommend conservative (non-surgical) management using a combination of non-pharmacological and

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pharmacological treatments. Non-pharmacological treatments of patient education and self-management, exercise and weight management are considered first line, core treatments recommended at all stages of disease. Joint replacement surgery is recommended when these treatments fail to provide adequate pain relief or maintenance of function [7]. Despite these recommendations, it appears that the current management of OA falls short of best practice [8–11]. Data from the BEACH program, a national study of general practitioner (GP) clinical activity in Australia, shows that medication prescription rates by GPs for knee OA are substantially higher compared to rates of lifestyle management (75% versus 27%, respectively [11]). Referral rates to orthopaedic surgeons are also much higher compared to referral rates to exercise/rehabilitation (13% versus 5%) [11].

Previous studies [9,12] show that health professionals have a poor understanding of the causes of and best practice treatment for OA and may hold unhelpful beliefs about the disease. This includes beliefs that OA is a disease caused by wear and tear that will worsen over time, uncertainty about the benefits and safety of exercise and concerns that exercise would cause further damage, an over-reliance on imaging and views that surgery is the preferable treatment option. These beliefs may negatively impact OA management [9,12]. It is important to understand the management of OA from diagnosis through to decision making for surgery to identify areas for improvement. To date only one qualitative study has captured the views of different medical professionals [13], demonstrating the need for further exploration.

Using a qualitative design, this study aimed to 1) explore the attitudes towards and understanding of OA held by Australian GPs and orthopaedic surgeons, 2) gain a deeper understanding of their views on conservative and surgical management, and 3) identify key barriers and challenges to management.

2. Method

2.1. Study design and participants

We conducted semi-structured interviews with GPs and orthopaedic surgeons throughout Tasmania. Publicly available practice information was used to invite participation in the study. Purposive sampling was used to include GPs of both sexes, from a range of ages and from both urban and rural practices from around Tasmania. All orthopaedic surgeons practicing in Tasmania were invited to participate ($n = 26$). GPs and surgeons were first contacted by letter, followed by a telephone call. GPs and surgeons who consented to participate assisted in identifying and recruiting additional GPs and surgeons. GPs were included if they had treated a patient with knee OA in the past six months and orthopaedic surgeons if they had performed a knee or hip replacement in the past six months. This research was conducted in compliance with the Declaration of Helsinki and was approved by the Tasmanian Health and Medical Human research ethics committee (H0017569). All participants provided written informed consent for face-to-face interviews and verbal consent for phone interviews prior to the commencement of the recorded interview.

3. Interviews

Seventeen GPs and ten surgeons were interviewed between April and August 2019. Interviews were conducted one-on-one either over the phone or in person using a semi-structured interview process by an experienced interviewer (JM). Interview schedules were developed (Tables 1 and 2) after a review of the literature and in consultation with an experienced clinician (TW), experienced OA researcher (DA), experienced qualitative researcher (EH) and the research team. Semi-structured interviews ensured key themes were explored, but allowed flexibility to accommodate the experience of the interviewee [14]. The interview schedules were tailored to reflect the different roles of GPs and surgeons. Demographic information including age, sex, region (greater

Table 1
GP Interview script.

Topic	Questions
What do GPs know about osteoarthritis?	How would you describe osteoarthritis? What causes osteoarthritis? Is it an inevitable part of aging? What is the prognosis of the disease once patients have it?
Disease management	How do you manage knee OA in your practice? What is the role of clinical examination? What is the role of pain relief? What role does imaging play in diagnosis of OA? When do you send a patient for scans? What informs your referral of OA patients to other health professionals? <ul style="list-style-type: none"> • What sort of referrals would you make? Can you tell me about your experience in referring OA patients to allied care health professionals? When would you refer a knee OA patient to a surgeon? Are you familiar with the Tasmanian Health Pathways? If yes, how does the Tasmanian Health Pathways support your care of patients with osteoarthritis? When you discuss joint replacement surgery as a treatment option, what do you say to your patients? What roles do other health professional share in managing OA?
Exercise	What do you see as the role of exercise in OA? What type of exercises would you prescribe and why? What do you think are the likely benefits of exercise for OA? Is exercise harmful? <ul style="list-style-type: none"> • Overall, do you think exercise would be helpful or harmful?
Barriers/challenges	What are the barriers to prescribing exercise in OA patients? What do you find challenging about treating a patient with knee OA?
Patient understanding	What do patients know about OA? What do patients think osteoarthritis is? What do your patients think caused their knee OA? What do you think patients want with regards to their treatment?

OA, Osteoarthritis.

city area or outer edges), and sessions per week was also collected.

3.1. Analysis

Interviews were audio recorded, transcribed verbatim and identified. All interviews were analysed post-data collection and the GP and surgeon transcripts were coded independently of each other. The decision to cease interviews was based on feedback by the interviewer (JM) that interviews were not eliciting any new ideas and pragmatic reasons (i.e., all eligible orthopaedic surgeons who indicated interest had been interviewed). Transcripts were coded using an inductive approach. For qualitative training purposes, coding was initially performed by two independent researchers, one experienced in qualitative research (AB) and one junior (LS), in Microsoft Excel for most (22) interviews. AB and LS coded interviews separately and compared coding decisions until there was consensus on main codes and their content (coding trees are included as appendix 1). Data was then imported into NVivo (QSR International), a qualitative data management software, where coding was reviewed and refined for all transcripts by LS with support from experienced NVivo user and qualitative researcher KJ. Transcripts then underwent iterative thematic analysis, with the generation of themes guided by the main codes [15]. Throughout this process there was reflexive consideration of the analysis and discussion between the analytic team (LS, DA, TW, KJ). The team included PhD candidate LS, experienced OA researcher DA, GP and experienced musculoskeletal researcher TW, and a registered physiotherapist and experienced qualitative researcher KJ. Justification and criteria for coding decisions and development of

Table 2
Surgeon interview script.

Topic	Questions/prompts
What do orthopaedic surgeons know about osteoarthritis?	How would you describe osteoarthritis? What causes osteoarthritis? Is it an inevitable part of aging? What is the prognosis of the disease once patients have it?
Disease management	How do you decide whether a patient needs surgery? What is the role of clinical examination? How do you decide whether a patient has failed conservative management? What roles do other health professional share in managing OA? (e.g., GPs, physiotherapists, podiatrists, exercise physiologists etc.) When one of your patients is considering having surgery, what do you tell them about the procedures? What are the pros and cons of having joint replacement surgery for OA?
Conservative management	What are your thoughts about conservative management as a treatment for osteoarthritis (exercise, weight loss, education/self-management)? Where do you think conservative management fits in the overall management of OA?
Barriers/challenges	What do you find challenging about treating a patient with knee OA?
Patient understanding	What do patients know about OA? What do patients think osteoarthritis is? What do your patients think caused their knee OA? What do you think patients want with regards to their treatment?

OA, Osteoarthritis; GP, General Practitioner.

main themes was recorded in the NVivo project log by LS. Themes were discussed amongst the analytic team and refined until there was consensus that the data had been comprehensively analysed, and no new themes were emerging.

4. Results

4.1. Participant characteristics

The mean age of the 17 GPs was 49.3 years (range 36–62) and of the 10 surgeons was 43.5 years (range 33–50). 24% (n = 4) of GPs and all surgeons were male. Most interviewees were from urban areas with 4 GPs working in a rural area and 1 surgeon in a regional area. GPs on average worked 4.4 sessions per week in general practice. Interviews ranged from 16 to 42 min.

4.2. Main themes

Four common themes were identified: disease understanding, disease management, barriers and challenges, and decision making for surgical referral/surgery. GP interviews also included a theme about OA diagnosis. All illustrative quotes were identified as from a GP or surgeon along with participant number e.g., GP04/S03.

4.3. Disease understanding

Both GPs and surgeons believed that the causes of OA were multifactorial and associated with previous injury/trauma, excess body weight, mechanical misalignment of the joint, age, and wear and tear on the joint. Surgeons commonly included genetics as a contributing factor whereas this was less commonly raised by GPs. As surgeon 02 described the cause: *“There can be lots of causes and it can be multifactorial ... I think there certainly can be a genetic component because it runs in families. It can be*

a mechanical component if you've got misalignment ... It can be if you've had previous injuries ...”

Most interviewees did not believe that OA was inevitable as people age but acknowledged that the prevalence of the OA increases with age. However, a few interviewees believed that OA was inevitable, for example, GP02 provided this reasoning: *“Being alive, because we're alive in a gravity environment over our lives. Just the constant wear and tear of using your joints over the course of your life the older you get, the more likely you are to get mechanical changes in your joints.”*

4.4. Diagnosing OA and the role of imaging

To diagnose OA, most GPs reported starting with a clinical assessment including a physical examination of the joint, taking a history of symptoms and injury/sporting history, and assessing risk factors such as age, weight, and activity level. X-Ray was commonly mentioned as a tool to rule out acute injury or other causes of symptoms. Most GPs acknowledged that severity of disease on an X-Ray does not correlate well with symptoms. Some GPs were reluctant to use X-Ray during diagnosis because of the potential negative impact it could have on patient understanding of their condition. GP14 described their use of imaging: *“I think imaging has limited usefulness, and as I said, sometimes the findings that we get on images don't correlate with the patient's symptoms, somebody can have very severe knee pain, and when we do the x-ray, we find sort of minimal changes of osteoarthritis ...”* However, some GPs did report always using imaging to support their diagnosis whereas others never used it or only in some circumstances.

GPs reported that they did not commonly order MRI scans; however, many would use imaging (X-ray and/or MRI) if they were referring a patient onto an orthopaedic surgeon, to provide a *“baseline”* for future surgery consultations.

4.5. Disease management

GPs and surgeons agreed that conservative management is always important before surgery. Both GP and surgeon conservative management typically included analgesia and non-pharmacological treatments including weight loss, exercise, and physiotherapy. GP02 explained their OA management *“So, we talk about non-medication management and medication management and in the non-medication management, we talk about weight management, physical therapies, so about exercise, water-based exercise, using heat when people get really sore and then in the medication management, mainly the use of paracetamol in the first instance when people need it.”* GPs regularly reported referring to physiotherapists for assistance with general and specific exercise advice and patient education. Referral to exercise physiologists were mentioned less often. Referral to a dietician for weight loss advice was mentioned by few GPs; and was usually raised as part of other chronic disease management (e.g., diabetes).

Patient preference, their willingness to participate in and previous use of non-operative treatments were important factors in surgeon's disease management decisions. As surgeon 08 described: *“Push every single patient through it [conservative management]. Clearly some have come already having pursued the appropriate treatment ... But so many of the patients turn up, yeah, probably without as much education so we go back to activity modification; we go back and discuss walking aids; we go to discuss weight loss for those people”.* Many surgeons also mentioned they would try off-loader bracing with patients before progressing to surgery, which is an option that was not mentioned by GPs.

4.6. The role of exercise

Both GPs and surgeons were highly supportive of exercise for patients with OA. GPs and surgeons believed exercise is beneficial for patients, reducing pain, improving function and mental health, and encouraging weight loss. GP02 elaborated: *“So, I see exercise as important for mental*

health because any chronic pain syndrome affects your mental health and wellbeing ... It's important to get people exercising to maintain function as well." GPs did not believe exercise was harmful if appropriately tailored to individual needs and acknowledged the importance of patient preference when choosing the type of exercise. Surgeons discussed exercise with a focus on guided exercise with a trainer, physiotherapist or exercise physiologist to promote safe strengthening exercises. Surgeon 06 describes his approach to exercise: "more physio than exercise ... – I think exercise is good for very early arthritis, but I don't often see those patients. And so, if a patient has got arthritis, I am looking at building their quads or building their glutes ... I do try and get patients to do something, like get in the pool. If they can't run anymore, I tell them to get a bike, and those kinds of things."

4.7. Barriers and challenges to managing OA

Managing poor patient understanding of OA and unrealistic expectations for treatment outcomes were identified as a major challenge by both GPs and surgeons. For example, one surgeon mentioned that some patients believe they will "cut out" the arthritis, similar to cancer surgery. GPs and surgeons also mentioned discussing treatment options more broadly was challenging. Patients want a cure, or 'quick fix' and it was challenging for them to explain that there are no disease modifying pharmacological treatments available. GP04 describes that patients often believe that OA is a normal part of aging but also expect a quick fix for their symptoms: "They just think it's wear and tear and it's just part of getting older a lot of the time" "A lot of people I think just want a pill, a quick fix, and don't like the answers when you tell them it's not [possible]" In addition to understanding the disease itself, surgeons identified patient understanding of surgery and the recovery process as challenges that needed to be managed. As S04 described: "The challenges are, I think setting that expectation, and we all know that it's such a major operation, ... So, I think that's the real challenge, is trying to make sure that they understand the recovery and what it's going to be like. Because I think that affects their outcome."

Lack of patient motivation, unwillingness to participate in and scepticism towards exercise or allied health referral was identified as a barrier to effective disease management and exercise prescription by GPs. GP05 explained: "I guess in reality a lot of people aren't engaged or motivated enough to make the lifestyle changes that will make a difference to their disease and giving tablets doesn't make a difference to their disease particularly or it might ease the pain a little bit. But often that's what people want because it's a lot easier to swallow two tablets than it is to do an hour's exercise or to restrict your diet." GPs mentioned that patients were fearful towards exercise, as described by GP02: "The main barrier is people's reluctance to do it ... their fear of making their condition worse, of making their pain worse and in some cases, it does make their pain worse. So, that experience of it hurting afterwards and people not liking that, hence the need for it to be an exercise that's appropriate to the person."

Cost and accessibility of conservative treatment options was identified as a barrier. For example, access to allied health professionals, ability to purchase exercise equipment or gym membership or access to suitable walking tracks. This was of particular concern for patients living in disadvantaged regions. GP08 explained: "In our area there is a perception that exercise costs money. There is also a fear of exercise in public and that can be personal safety fear about walking in the local community ... one of the comments is just having appropriate footwear ... it sounds simple ... but having a decent pair of sneakers is a big thing."

4.8. Decision making for surgery

Surgery was considered as a suitable option by both GPs and surgeons when non-surgical treatment methods had been exhausted. The decision by GPs & surgeons to refer for/perform surgery was multifactorial and based upon patients' symptoms including pain severity & tolerance, function, sleep quality, no response to conservative management, fitness for surgery and patient preference. GP02 described their referring

pattern: "I generally don't refer to surgeons for osteoarthritis unless the patient is at a point where they want to see a surgeon". As surgeon 07 explained: "A lot of it comes from what the patient tells me in terms of their symptoms and how they're coping on a day-to-day basis I use what they're telling me in conjunction with what I find on clinical examination, what I see on x-rays, to decide whether patient would be an ideal candidate for joint replacement surgery."

Waiting times were a consideration for GPs when referring for surgery, with some GPs choosing to refer earlier to the publicly funded system where waiting lists are long, and some more reluctant to refer to the private system due to the expedited process, with a perception that conservative management options may be bypassed. GP04 clarified: "If they've not got private health insurance I might refer earlier with the understanding that they're going to be waiting a year anyway ... so at least they've got the ball rolling in the process."

5. Discussion

This is one of the first studies to explore the attitudes, understanding and management of OA by GPs and surgeons simultaneously in the same population. GPs and surgeons reported a mostly evidence-based understanding of and approach to managing OA with strong support for conservative management. Key treatment barriers included managing poor patient understanding & treatment expectations of OA, lack of patient motivation and scepticism towards exercise, and cost and accessibility of conservative treatment options. Surgery was considered a suitable option when conservative management options had been exhausted. Table 3 outlines the key findings and recommendations for practice.

Our findings suggest that the general understanding of, and attitudes towards OA appear to be more closely aligned with best practice guidelines than was found in previous studies. All surgeons and most, but not all GPs, reported an understanding of the disease that aligned with current evidence and acknowledged that developing OA was not an inevitable part of aging. This contrasts with a systematic review of qualitative studies, mostly conducted outside Australia, that showed among primary care clinicians there was a perception that OA is not that serious and was believed to be part of a normal aging process [9].

Whilst most GPs reported only using X-Ray to rule out other causes of symptoms and for referrals, some did report always using imaging to diagnose OA. The Australian Osteoarthritis of the Knee Clinical Care Standard [7] indicates that knee OA can be diagnosed based on clinical assessment alone, unless an alternative diagnosis is suspected.

Table 3

Key study findings and recommendations for practice.

Key study findings	Recommendations for practice
GPs and surgeons had an evidence-based understanding of OA.	Education and resources for practitioners about:
Some GPs report always using imaging to support their OA diagnosis.	• Patient directed OA education programs/opportunities.
Conservative management was highly supported by GPs and surgeons, but barriers exist.	• Appropriate use of imaging for OA diagnosis.
Treatment barriers include:	• Use of 'first-line' conservative management prior to surgical referral.
• Managing poor patient understanding of OA.	Increased patient education about OA through:
• Unrealistic expectations for treatment.	• Improved visibility and awareness of local OA management programs.
• Lack of patient motivation and scepticism towards exercise.	• Lower out-of-pocket costs for patients.
• Cost and accessibility of conservative treatment options, particularly access to allied health professionals.	Improved reimbursement models supporting conservative management through:
• Poor patient understanding and expectations of surgery.	• New funding models (public and private) that support exercise for OA management.
Some GPs refer 'early' to surgery because of long elective surgery wait lists.	Enhanced accessibility and awareness about OA conservative management programs.

Reassuringly, most GPs knew that the severity of disease on an X-Ray does not correlate well with symptoms, and some discussed the potential negative impact that imaging can have on patient understanding and expectations. This shows that the GPs in our study had a generally good understanding of appropriate use of imaging, however, the over-use by some GPs is indicative that this evidence-based recommendation is not considered by all clinicians. Estimates from the BEACH study between 2010 and 2016 suggest that around half of all new knee and hip OA problems were still referred for imaging [3,11]. While this data is five years old, our results suggest that the overuse identified may still be an issue.

GPs and surgeons were highly supportive of exercise for patients with OA, believing it was safe and beneficial. They reported using exercise as first line treatment. These findings do not reflect previous research [8–10,16] which showed widespread uncertainty among doctors about the benefits and safety of exercise for OA patients. Interestingly, lack of expertise in prescribing exercise for OA patients, previously identified as a barrier [17], was not a theme in our study and was only raised by one GP. The overwhelmingly positive attitudes about the importance of exercise are reassuring and may suggest that practice behaviour is changing. This also reflects the findings of a recently published Australian qualitative study in orthopaedic surgeons, GPs, and rheumatologists [13]. Recently updated national guidelines [4] and the introduction of an Osteoarthritis of the Knee Clinical Care Standard in Australia [7] could contribute to this, however our GPs did not specifically mention these updated recommendations. Alternatively, selection bias may have played a role, particularly for the GPs who chose to be involved. The health professionals included in our study may have had greater knowledge and interest in contemporary OA management, which may not be reflective of the wider professional population. It is also possible that their actual behaviour may not reflect their self-reported behaviour and that they responded in a socially desirable manner.

GPs and surgeons described many barriers to disease management, particularly regarding exercise. Unrealistic patient expectations with patients' desire for a quick fix, fear of making their symptoms and disease worse, lack of motivation, unwillingness, and scepticism about the benefits of exercise, cost and accessibility were all perceived as challenges for referral and patient uptake of exercise to manage their condition. Dissonant patient expectations have previously been identified as a barrier for clinicians [9,18] and these barriers have also been identified in patient studies [19–22]. This highlights the need for greater patient education on the benefits and safety of exercise and improved visibility and awareness of local management programs. Some available options in Tasmania include programs run by Arthritis & Osteoporosis Tasmania, national web-based initiatives (e.g. MyJointPain), and the internationally recognised locally delivered evidence-based education and exercise program GLA:D® [23]. Interestingly, such programs were not commonly discussed by the GPs in our study. Despite the recent updates and dissemination of OA guidelines [4–6], the OARSI white paper on OA as a serious disease [24], and the development of an Australian National Osteoarthritis Strategy [25] major barriers still exist. There needs to be greater promotion of evidence-based OA management programs along with improved reimbursement models supporting such programs as first-line treatment for OA.

The number of joint replacements performed for OA each year is increasing at an unsustainable rate [10]. In Australia, OA patients are more likely to be referred to an orthopaedic surgeon than an allied health professional [11]. The GPs in our study appeared evidence-based in their decision to refer for surgery. However, they did state wait times were a consideration and some referred early to the public system knowing they could continue pursuing conservative management options while the patient waited for surgical review. One previous study identified that only 11% of patients referred for orthopaedic consultation at a public Tasmanian hospital reported trying strength training for their OA and no patients had been involved in any type of formal education [26]. Early referral has the potential to give patients the perception that they will

eventually need surgery and may undervalue conservative management [27] potentially impacting patient motivation to participate in conservative management or placing a higher value on surgery.

6. Strengths

This study is unique as we simultaneously interviewed GPs and surgeons, therefore capturing two crucial areas of OA management. It also provides an Australian perspective on the views of GPs and surgeons, as most studies to date have been conducted internationally [9,28]. The qualitative design provides further insight into *the reasoning* behind management decisions used by local GP and surgeons. This provides greater insight into how these professionals can be supported to improve OA management.

7. Limitations

Firstly, the number of surgeons interviewed was low ($n = 10$); however, this represents nearly half of the 26 practicing orthopaedic surgeons in Tasmania at the time of the study. There were no female orthopaedic surgeons practicing in Tasmania at the time of the study, and Australia-wide only 3.1% are female. No new themes were emerging during analysis; however, it is possible that a broader range of surgeons may have provided different perspectives. Secondly, despite purposive sampling approaches to ensure GPs were recruited from rural/urban settings, both sexes and a range of ages, there was a significant skew in gender balance amongst the included GPs who were predominantly female, whereas 49.9% of GPs in Tasmania are male (57.7% of GP FTE). Thirdly, most GPs were from urban areas. A more varied sample of GPs may have provided more insight into barriers encountered in rural areas. However, GPs did raise cost and accessibility as a main barrier, providing evidence that the demographics sensitive to these factors were represented. This study was conducted in one regional state within Australia. Therefore, our results may be transferable to GPs and surgeons in regional Australian centres and may be less readily applicable to other settings. However, our findings were consistent with a recently published qualitative study conducted in metropolitan Melbourne [13]. Lastly, interviewees may have been generally more interested in treating OA and therefore more aware of updated guidelines. As such, our results may not be applicable to the whole GP/orthopaedic surgeon population.

8. Conclusion

This study identifies key barriers to OA treatment in Tasmania. Options for improving treatment include creating opportunities for increased practitioner and patient education about OA, enhanced accessibility to OA conservative management programs along with improved reimbursement models supporting conservative management as first-line OA treatment.

Author contributions

All authors were involved in drafting the article or revising it for important intellectual content. All authors have approved the final manuscript. Laura Sutton (Laura.Sutton@utas.edu.au) takes responsibility for the integrity of the work as a whole, from inception to finished article.

Conception and design

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Acquisition of data

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Analysis and interpretation of the data

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Declaration of competing interest

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Appendix A. Supplementary data

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