

# BMJ Open Community-based online survey on seeking care and information for lower limb pain and injury in Australia: an observational study

Jocelyn L Bowden <sup>1,2</sup>, Rod Lamberts,<sup>3</sup> David J Hunter <sup>1,2</sup>, Luciano Ricardo Melo,<sup>1,4</sup> Kathryn Mills<sup>5</sup>

**To cite:** Bowden JL, Lamberts R, Hunter DJ, *et al.* Community-based online survey on seeking care and information for lower limb pain and injury in Australia: an observational study. *BMJ Open* 2020;**10**:e035030. doi:10.1136/bmjopen-2019-035030

► Prepublication history and additional material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2019-035030>).

Received 16 October 2019  
Revised 19 March 2020  
Accepted 13 May 2020



© Author(s) (or their employer(s)) 2020. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

For numbered affiliations see end of article.

## Correspondence to

Dr Kathryn Mills;  
[kathryn.mills@mq.edu.au](mailto:kathryn.mills@mq.edu.au)

## ABSTRACT

**Objectives** Musculoskeletal pain is a leading cause of disability globally. In geographically and socioeconomically diverse countries, such as Australia, care seeking when someone experiences musculoskeletal pain is varied and potentially influenced by their individual characteristics, access to practitioners or perceived trustworthiness of information. This study explored how consumers currently access healthcare, how well it is trusted and if sociodemographic factors influenced healthcare utilisation.

**Design** Anonymous online observational survey.

**Setting** Australia.

**Participants** A convenience sample of 831 community-based individuals (18+ years).

**Outcome measures** Descriptive analyses and generalised estimating equations were used to quantify healthcare-seeking behaviours, sources and trust of health information for (A) first-contact practitioners, (B) medical practitioners, and (C) other sources of information.

**Results** Of the 761 respondents, 73% were females, 54% resided in capital cities. 68% of respondents had experienced pain or injury in more than one lower limb joint. Despite this, more than 30% of respondents only sought help when there had not been natural resolution of their pain. Physiotherapists had the highest odds of being seen, asked and trusted for healthcare information. The odds of seeking care from general practitioners were no higher than seeking information from an expert website. Older individuals and women exhibited higher odds of seeking, asking and trusting health information.

**Conclusion** Intelligible and trustworthy information must be available for consumers experiencing lower limb pain. Individuals, particularly younger people, are seeking information from multiple, unregulated sources. This suggests that healthcare professionals may need to invest time and resources into improving the trustworthiness and availability of healthcare information to improve healthcare quality.

## INTRODUCTION

Patient-centred care is a goal of healthcare delivery worldwide.<sup>1</sup> The underlying tenets of patient-centred care revolve around ‘respect of, and response to, the preferences, needs and values of the healthcare consumer’.<sup>2</sup>

## Strengths and limitations of this study

- First Australian survey investigating healthcare-seeking behaviours and trust of health information for lower limb musculoskeletal conditions.
- We highlight the occurrence of longer lasting or severe lower limb musculoskeletal pain in an Australian community cohort.
- This was a sample of convenience and not a true random sample.
- We had a good representation across age groups, but our sample was predominantly female and had private health insurance.

A successful patient-centred approach, however, also requires a shift in the consumer’s perception of their own role in managing their health. To encourage self-ownership of healthcare, there must be trust and confidence in the healthcare provider to deliver appropriate and considerate care; the availability of accurate, complete and intelligible information to aid decision-making, and availability of appropriate healthcare services.<sup>1,3</sup>

Musculoskeletal injuries and chronic conditions are a leading cause of pain and disability.<sup>4,5</sup> In Australia, the burden of disease attributed to musculoskeletal conditions surpasses all other chronic health conditions in terms of years lived with disability.<sup>6,7</sup> Lower limb injuries reportedly occurred in 11% of the Australasian population in 2010,<sup>8</sup> while the lifetime prevalence of developing lower limb musculoskeletal symptoms is estimated between 26% and 53%.<sup>9,10</sup> Regional areas, and people living in lower socioeconomic areas, have higher rates of musculoskeletal burden than others,<sup>7</sup> but less access to healthcare.<sup>11</sup> Long-term musculoskeletal conditions such as osteoarthritis can be particularly debilitating, with pain dominating and function greatly compromised over time. High



levels of depression, sleep disorders and reduced work productivity are more prevalent in people with chronic and painful conditions.<sup>12</sup> These numbers are increasing rapidly, particularly in people aged over 45 years; in women; and for some conditions, people who are overweight or obese.<sup>7</sup>

Management of lower limb musculoskeletal conditions in Australia is predominantly undertaken in primary care settings, particularly by general practitioners (GP) and other specialist health professionals (eg, physiotherapists, dieticians).<sup>5 13</sup> The recommended management of musculoskeletal conditions is commonly lifestyle interventions (eg, exercise, weight management), and other interventions primarily targeted at controlling pain, and improving functioning and health-related quality of life.<sup>7</sup> Yet, Australian and international research has shown that many people do not receive appropriate evidence-based treatment for their condition.<sup>14 15</sup> Studies suggest many GPs are not confident to diagnose or treat musculoskeletal conditions, but also do not refer to physiotherapists or other healthcare professionals with expertise in this area.<sup>14 16–18</sup> It is also thought many lower limb musculoskeletal conditions, especially those related to chronic pain (eg, osteoarthritis), are under-reported internationally. Musculoskeletal pain is often considered a ‘less-important’ condition, or is incorrectly assumed a ‘normal’ part of ageing.<sup>19</sup> Consequently, little research has been undertaken internationally on people’s perceptions or attitudes to the treatment of their musculoskeletal pain. Studies conducted in Hong Kong,<sup>20</sup> Canada<sup>21</sup> and the UK<sup>22</sup> suggest the general public not only trivialise musculoskeletal complaints, but are confused about which health practitioner to seek care from, and often seek treatment advice from their friends, family or the internet rather than healthcare professionals. It is likely these trends also occur in Australia; however, this has never been demonstrated, nor have the reasons for this behaviour been elicited.

Andersen’s behavioural model of health services<sup>23</sup> argues that the interaction of factors such as demographics (eg, age and sex), social structure (coping skills, education, networks) and health beliefs (attitudes, values and knowledge) are predisposing factors for use of healthcare services. However, health services and supporting resources must also be in place to enable access to these services, as well as people having the means, knowledge and self-efficacy to use these systems (income, insurance, reasonable travel/waiting time).<sup>23</sup> Although this model was originally developed more than 50 years ago, the theory still holds today and we have sought to explore personal (rather than system-based) attributes that may influence care-seeking behaviour in this study. There are currently little data on the management and treatment of musculoskeletal conditions in Australia due to a lack of available data on primary and allied healthcare more generally, and including patient outcomes and pathways through the healthcare system.<sup>24</sup>

We conducted an internet-based survey in an Australian cohort to gain an understanding of the occurrence

of lower limb pain and injury in Australia and how patient consumers currently perceive these conditions. We sought to gain some insight into how they sought care within the Australian healthcare system. The aims of the current study were to gain a better understanding of how patient consumers currently engaged with the healthcare system, including when and why these services were more likely to be used; their levels of trust in the healthcare information provided; and to determine if any sociodemographic factors were associated with people’s healthcare utilisation. This information will be of great value when planning future community-based and primary care interventions, and will be an important consideration when delivering quality, patient-centred healthcare for musculoskeletal disorders of the lower limb.<sup>25</sup>

## METHODS

### Participants

A convenience sample of 831 community-based individuals (18+ years), and residing full time in Australia were recruited. Participants were recruited through university/educational networks, community groups, sporting clubs and word of mouth. A Facebook page was developed to disseminate the survey, and advertising flyers which contained the URL link and quick response codes were circulated via community notice boards, face to face, mailing lists or via social media. After development and pretest, the survey was kept open for 5 months (May to October 2017).

### The survey

As there was no suitable validated questionnaire available to collect the data required, a custom-built anonymous online survey (Qualtrics, Utah, USA) was developed by the authors. The survey consisted of 35 questions divided into three question blocks. A copy of the survey is available in online supplementary appendix 1. The first block consisted of demographic questions including age, identifying gender, postcode and education level. In block 2, participants were asked about any history of pain or injury in their lower limbs, specifically around the ankle, knee or hip. It was further divided into (1) acute injury or pain, lasting less than 6 weeks, (2) longer lasting injuries persisting more than 6 weeks, and (3) severe pain defined as  $\geq 7/10$  on a numerical scale (10=‘worst pain imaginable’). Block 3 consisted of questions pertaining to participants’ behaviours towards asking and trusting information from various sources regarding healthcare of the lower limbs. Questions were delivered via an adaptive logic that guided participants through the survey. There were no incentives for participation, and respondents could discontinue the survey at any time. All responses were anonymous and allocated a response number for analysis. All demographic data were recorded in broad categories.

### Outcome measures

#### Treatment-seeking behaviours

All response options were categorical except for questions pertaining to seeking care (see online supplementary

appendix 1). Participants who responded that they had experienced previous lower limb pain or injury were asked when they sought treatment (seven options), what action they typically took for pain or injury (seven options), how willing they were to seek care from different healthcare providers (11 providers listed, see the Statistical Analyses section) and how far they were willing to travel to seek care (six options). Participants were also asked their attitudes to their own role in directing treatment. For this question, respondents ranked the likelihood of seeking care from different practitioners on a 5-point scale ranging from 'I would not seek care' to 'I would definitely seek care'.

#### Trust of health information

Respondents' trust of lower limb healthcare sources and information was ranked on 5-point scales. Anchors for the question on how interested respondents were in obtaining health information were 'not at all' and 'very interested'. Anchors for how likely respondents were to ask different health practitioners for information, seek information from other sources and the likeliness to trust information from both practitioners and other sources were 'I would not ask/source/trust information' and 'I would definitely ask/source/trust information'.

#### Patient and public involvement

The public were not involved in the design, reporting or dissemination of our research. Community organisations, sporting clubs and other networks helped advertise and distribute the link to the survey through their newsletters and other communication forums. We will distribute our final results through our organisational websites and volunteer networks. This work will be used to inform our future studies.

#### Data availability statement

No additional data are available for this study.

#### Statistical analyses

Statistical analyses were conducted in SPSS V.24 (IBM). Data were cleaned and checked for completeness, and only responses with all mandatory responses completed were analysed.

Response frequencies and proportions were used to examine demographics (in predefined age brackets), lower limb musculoskeletal pain and injury history, willingness to travel, approach to treatment, level of interest in health information and when information about lower limb healthcare was sought. Pain or injury history was further divided into the three primary joint areas (ankle, knee and hip). Willingness to travel was described based on categories of pain duration/severity. Approach to treatment was categorised based on the type of health practitioner.

For questions pertaining to seeking care, asking for and trusting health information participants were asked to rate the likelihood of their response for multiple items within a single question. Generalised estimating

equations with robust assumptions and exchangeable correlation structure were used to model these data as this approach permits multiple responses and considers how these responses are associated.<sup>26</sup> Respondent identification was treated as a repeated variable. The logistic regression function was used for yes/no responses (main healthcare action people took) and the linear model function was used when 5-point scales were used. For questions pertaining to seeking care, asking for and trusting healthcare information, the type of healthcare professional was the primary independent variable. Healthcare providers were separated into two models a priori based on themes of the care provided. The first was titled 'first contact practitioners' and consisted of GPs (referent), physiotherapists, podiatrist, exercise physiologists, chiropractors, osteopaths and naturopaths. The second model was 'medical' consisting of GPs (referent), sports physicians, rheumatologists and orthopaedic surgeons. A third model of 'other sources' was included for asking and trusting information.

A priori pragmatic decisions were made regarding covariates for each model. Univariate examinations of gender; age (treated as a continuous variable); education level; private health insurance status; living location; and income were conducted, controlling for profession. Multivariate models were constructed using a forced entry method of the variables with significant univariate association with the dependent variable. Individuals with missing data were retained in all analyses.

## RESULTS

### Respondent demographics

Responses were received from 831 people, with all mandatory fields completed by 764 people. There were between 103 and 176 responses in each age category (table 1). The majority of respondents were female (73%), reported English as their first language (88%), lived in a capital city (54%), had private health insurance (79%) and had lived in Australia for the majority of their lives (82%). The majority of respondents had experienced lower limb pain, particularly in the ankle or knee (table 2), frequently in more than one joint in their lifetime (<6 weeks duration 68%, ≥6 weeks 41% and severe pain 36%).

### Seeking treatment for lower limb pain and injury

More than one-third of respondents reported that they only seek treatment for pain or injury in lower limb muscle and joints when it does not naturally resolve (figure 1). How frequently individuals took action for ankle pain or injury was associated with where they lived ( $p=0.018$ ). Compared with respondents living in capital cities, those living in metropolitan centres had a 23% reduction in odds of taking any form of action (0.77, 95% CI 0.61 to 0.96) and those living regionally exhibited a 26% reduction in odds of undertaking treatment (OR 0.74, 95% CI 0.57 to 0.96). When experiencing hip pain or injury, women had 1.3 (95% CI 1.03 to 1.62) times the odds of

**Table 1** Demographics of respondents presented in age brackets (years)

Variable	18–29 years (n (%))	30–39 years (n (%))	40–49 years (n (%))	50–59 years (n (%))	60–69 years (n (%))	70+ years (n (%))
Responses (n)	105	131	103	139	176	110
Sex()						
Female	71 (67.6)	89 (67.9)	85 (82.5)	115 (82.7)	130 (73.9)	71 (64.5)
Income()						
<15 000	15 (14.3)	8 (6.1)	5 (4.9)	12 (8.6)	17 (9.7)	14 (12.7)
15 000 to <31 000	15 (14.3)	3 (2.3)	10 (9.7)	14 (10.1)	46 (26.1)	38 (34.5)
31 000 to <52 000	26 (24.8)	15 (11.5)	9 (8.7)	22 (15.8)	36 (20.5)	31 (28.2)
52 000 to <78 000	30 (28.6)	27 (20.6)	15 (14.6)	26 (18.7)	29 (16.5)	15 (13.6)
>78 000	19 (18.1)	78 (59.5)	64 (62.1)	65 (46.8)	48 (27.3)	12 (10.9)
Private health insurance()						
Yes	72 (68.6)	115 (87.8)	86 (83.5%)	111 (79.9)	131 (74.4)	90 (81.8)
Living location()						
Capital city	65 (61.9)	87 (66.4)	70 (68)	65 (46.8)	74 (42)	55 (50)
Metropolitan centre	30 (28.6)	30 (22.9)	14 (13.6)	39 (28.1)	52 (29.5)	23 (20.9)
Regional/remote	10 (9.5)	14 (10.7)	19 (18.4)	34 (24.5)	50 (28.4)	31 (28.2)
Primary country of residence throughout life()						
Australia	85 (81)	97 (74)	80 (77.7)	122 (87.8)	150 (85.2)	90 (81.8)
Country other than Australia	17 (16.2)	33 (25.2)	23 (22.3)	17 (12.2)	26 (14.8)	20 (18.2)
First language()						
English	92 (87.6)	109 (83.2)	84 (81.6)	123 (88.5)	152 (86.4)	92 (83.6)
Language other than English	13 (12.4)	22 (16.8)	19 (18.4)	16 (11.5)	24 (13.6)	18 (16.4)
Indigenous or Torres Strait Islander()						
Yes	0 (0)	1 (0.8)	0 (0)	1 (0.7)	3 (1.7)	1 (0.9)
Education						
Completed year 12 or less	14 (13.3)	6 (4.6)	10 (9.7%)	29 (20.9)	38 (21.6)	26 (23.6)
Certificate III or IV	5 (4.8)	6 (4.6)	9 (8.7)	11 (7.9)	16 (9.1)	5 (4.5)
Diploma or advanced diploma	2 (1.9)	8 (6.1)	10 (9.7)	28 (20.1)	34 (19.3)	20 (18.2)
Bachelor's degree	41 (39)	49 (37.4)	28 (27.2)	21 (15.1)	29 (16.5)	15 (13.6)
Graduate certificate or diploma	1 (1)	10 (7.6)	13 (12.6)	13 (9.3)	24 (13.7)	18 (16.4)
Postgraduate degree	42 (40)	52 (39.7)	32 (31.1)	37 (26.6)	35 (19.9)	24 (21.8)

Percentage represents percentage of entire number of respondents in each category. Respondents were not required to provide a response for all questions, therefore not all percentages will add to 100%.

†Data are presented as number of responses and the percentage of the total number per age group (%). Income is reported in Australian dollars (\$A)

taking any form of action compared with men, and individuals with a certificate III or IV qualification exhibited 1.9 (95% CI 1.02 to 3.5) times the odds of undertaking treatment compared with those who had completed high school only. When taking action, 62%–73% of respondents reported that their preference was to seek care from a primary care practitioner (table 2).

There was no effect of living location on how far people were willing to travel for care (figure 2). The most frequent response category for acute pain was <30 min (n=273, 45%). For longer lasting pain, respondents were most frequently willing to travel between 30 and 60 min

(n=239, 39%). Over half of the participants (n=332, 52%) were not willing to travel more than 60 min, even when experiencing severe pain.

Respondents were significantly more likely to seek care from a physiotherapist (0.35 points (0.2–0.5)) than a GP or any other first-contact practitioner. However, they were significantly more likely to seek care from a GP than another member of the medical profession (online supplementary table). Multivariate modelling, adjusted for gender, education, living location and income, revealed that women rated their likelihood of seeking care from first-contact practitioners 0.2 points (0.1–0.3) higher than



**Table 2** Pain/injury experiences and typical healthcare-seeking responses for the ankle, knee and hip and surrounding area. Numbers are frequency (n) and percentages (%) are proportions of the total analysed sample (n=764)

Variable	Ankle (n (%))	Knee (n (%))	Hip (n (%))
Acute pain (n)	522	531	511
Never	92 (12)	98 (12.8)	191 (25)
Once	75 (9.8)	61 (8)	43 (5.6)
A few times in my life	282 (36.9)	231 (30.2)	155 (20.3)
Once a year	22 (2.9)	30 (3.9)	23 (3)
Once every 3 months	25 (3.3)	31 (4.1)	31 (4.1)
Every month	26 (3.4)	80 (10.5)	68 (8.9)
Longer term* (n)	469	551	494
Never	229 (30)	191 (25)	266 (34.8)
Once	78 (10.2)	77 (10.1)	45 (5.9)
A few times in my life	103 (13.5)	131 (17.1)	64 (8.4)
Once a year	5 (0.7)	9 (1.2)	6 (0.8)
Once every 3 months	11 (1.4)	30 (3.9)	28 (3.7)
Constant	43 (5.6)	113 (14.8)	85 (11.1)
Severe pain† (n)	441	493	455
Never	206 (27)	224 (29.3)	284 (37.2)
Once	100 (13.1)	66 (8.6)	37 (4.8)
A few times in my life	97 (12.7)	106 (13.9)	62 (8.1)
Once a year	5 (0.7)	7 (0.9)	8 (1)
Once every 3 months	10 (1.3)	17 (2.2)	18 (2.4)
Every month	23 (3)	73 (9.6)	46 (6)
Response to injury or pain			
Go to the hospital	86 (11.3)	61 (8)	27 (3.5)
Seek care from a primary care practitioner	277 (36.3)	316 (41.4)	216 (28.3)
Take analgesics or anti-inflammatories	210 (27.5)	235 (30.8)	166 (21.7)
Ignore it	65 (8.5)	80 (10.5)	78 (10.2)
Basic first aid (RICE)	234 (30.6)	216 (28.3)	169 (22.1)
Alternative therapy pathways	41 (5.4)	65 (8.5)	55 (7.2)
Other	3 (0.4)	12 (1.6)	9 (1.2)

\*Defined as pain or injury lasting more than 6 weeks.

†Defined as pain rating >7/10 to 10/10 regardless of longevity. RICE, rest, ice, compression and elevation.

men. Both the first contact and medical models, the latter adjusted for age, education and income, demonstrated significant positive linear relationships between age and ratings of the likelihood of seeking care (online supplementary table).

Respondents' attitudes towards their role in directing treatment were that of shared responsibility with both GPs and physiotherapists whereby respondents expected to work with their practitioner to address their issue (n=336, 60% and n=357, 62% respectively). In contrast,

orthopaedic surgeons were expected to do most of the work to address their issue (n=221, 54%), followed by a shared responsibility (n=159, 39%).

### Health information-seeking habits

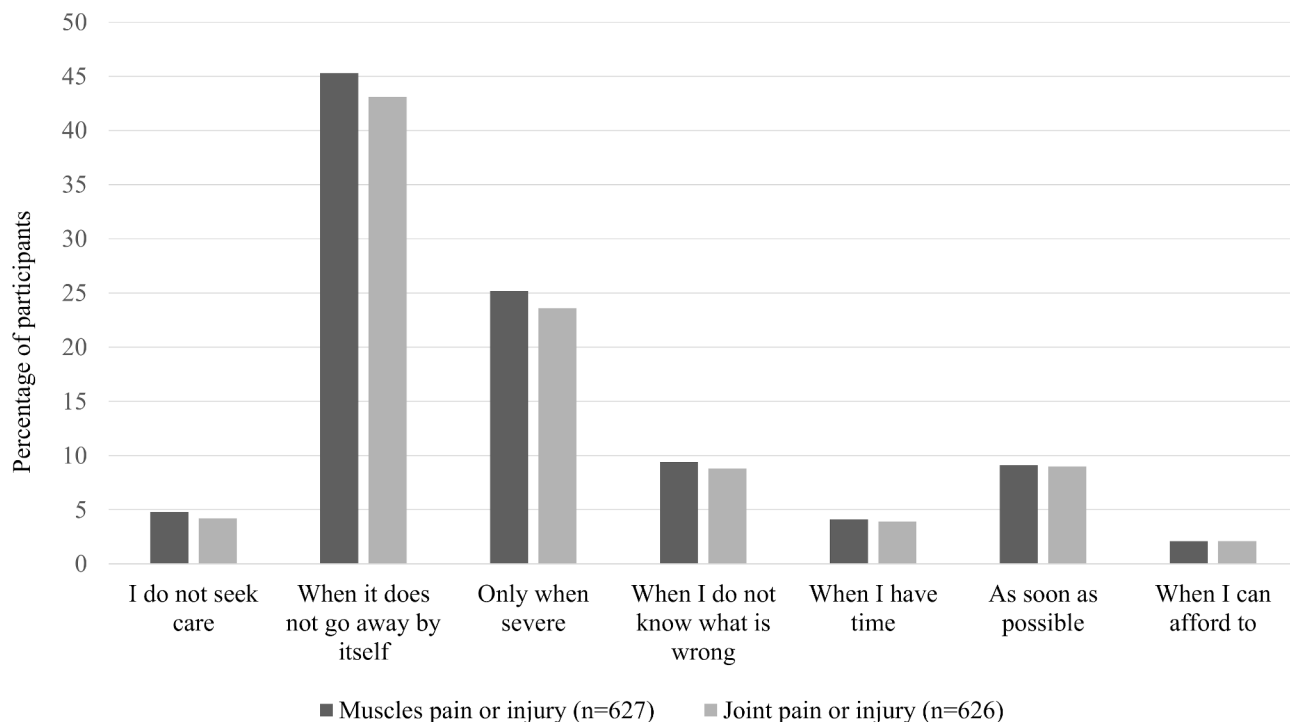
Over 89% of participants responded that they were 'very' (54%) or 'quite a bit' (35%) interested in information on their condition. Respondents' interest in health information significantly influenced ratings on their likelihood of asking for or accessing any source of information ( $p<0.001$ ). Multivariate analyses, adjusted for gender, age and education, demonstrated that compared with GPs, individuals rated themselves as more likely to ask a physiotherapist for health information (0.3 points (0.1, 0.5)), with women rating themselves 0.2 points (0.1, 0.3) more likely to ask. In a model adjusted for age and education, GPs were more likely to be asked for health information than other medical practitioners, with the likelihood of asking increasing linearly with each age bracket (0.15 points (0.1, 0.2)) (online supplementary table). There was no difference in respondents' ratings of their likelihood of asking GPs for information compared with accessing information through a website they perceived as 'expert' (0.05 (-0.1 to 0.2)) and this was not influenced by socio-demographic variables.

### Trust in healthcare information

Similar to the likelihood of asking for health information, respondents indicated that the healthcare profession, the source of information and their interest in obtaining information significantly influenced how likely they would be to *trust* the information they were provided (see online supplementary table). Multivariate analyses (see online supplementary table), adjusted for gender, age, income and education, indicated that information delivered by physiotherapists was more likely to be trusted than information from GPs (0.3 points (0.2, 0.4)); however, the level of trust decreased with incomes greater than \$15 000 per year. Similarly, compared with GPs, health information delivered by orthopaedic surgeons (0.3 points (0.2, 0.4)) and sports physicians (0.2 (0.1, 0.3)) was rated as more likely to be trusted. Ratings for trusting information from medical practitioners significantly increased with age (0.05 points per age group (0.0, 0.1)) but were lower in all income brackets greater than \$15 000 per year (online supplementary table). Similar to accessing information, no sociodemographic variables influenced the likelihood of trusting information from other sources compared with information delivered by GPs, with GPs exhibiting the highest trust ratings in this model (online supplementary table).

### DISCUSSION

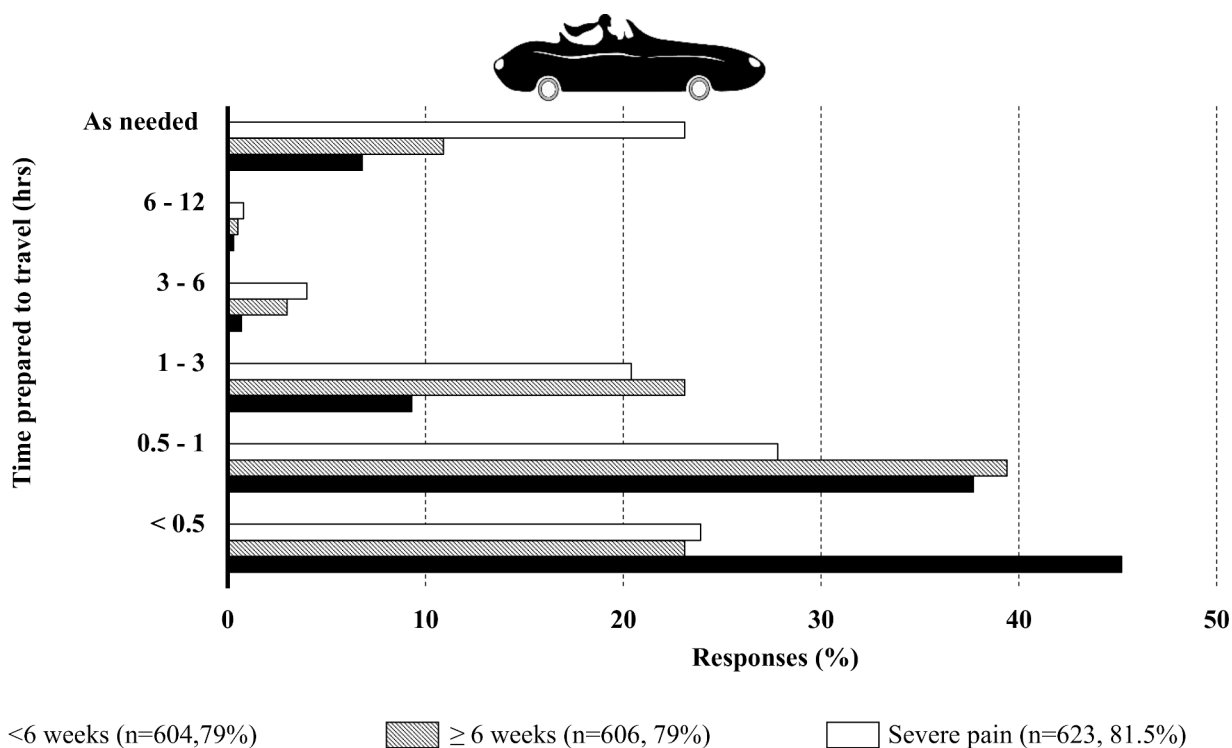
To truly foster patient-centred healthcare it is essential to have trust and confidence in the healthcare provider to deliver timely and appropriate care, access to accurate, complete and intelligible information that aids



**Figure 1** When respondents seek care for pain or injury in their lower limb muscles (dark grey bars) and joints (light grey bars). Each bar represents the percentage of participants selecting each response. Participants were only permitted to choose a single response.

decision-making and the availability of appropriate healthcare services.<sup>13</sup> As the number of providers and sources of healthcare services and information has increased over recent decades, it is theoretically plausible that consumer

confidence in accessing, asking for and trusting information may have increased concurrently. This study sought to gain an understanding of how patient consumers currently engage with the Australian healthcare system



**Figure 2** Time prepared to travel for treatment. Each horizontal bar represents the percentage of respondents for each pain classification who were willing to travel that distance to seek treatment. Black-filled bars represent acute pain (<6 weeks duration), hatched bars represent longer lasting pain (≥6 weeks duration) and open bars represent severe pain.

for their lower limb musculoskeletal conditions, their levels of trust in healthcare information provided and if there are sociodemographic factors that may influence their access to, and use of these services. A behavioural model of accessing health services<sup>23</sup> identified that socio-demographic and health beliefs are important predisposing factors for using healthcare. Our findings suggest this may be the case for lower limb musculoskeletal pain.

Our results show that lower limb pain and injury were common, often occurred in multiple joints and highlighted the high occurrence of longer lasting and severe pain in our community. These results reflect previous Australian work.<sup>27</sup> However, healthcare was typically only sought when the pain did not go away by itself or when it was particularly severe. Previous studies have suggested that pain intensity per se is not a factor for seeking care, but rather the disability and comorbidities associated with this pain were driving factors,<sup>28</sup> however we did not ask about disability in our survey. Gender, living location and age were found to be the most common influences of healthcare utilisation, whereas income was a significant factor in trust of healthcare information. Younger people, in particular, were less likely to visit a GP to discuss their condition than older age groups and were less trusting of the information provided.

Our results suggest the majority of our cohort were willing to be involved in their own healthcare and were interested in increasing their health literacy. However, we identified several barriers to seeking care. While most respondents were willing to travel up to 60 min to seek care, they were only willing to travel further if they were in severe pain. This response was consistent regardless of the respondent's gender, living location or site of pain. Accessibility, or lack thereof, to healthcare has long been acknowledged as a problem for individuals living in regional or rural areas.<sup>24 29</sup> With the majority of Australians living in capital cities or metropolitan areas<sup>30</sup> issues of accessibility were typically viewed as impacting a small percentage of the population. However, as populations in cities grow, and there is accompanying urban sprawl, travel impedance is theorised to become as much of a concern to accessing primary care as physical distance.<sup>31</sup> Both travel time and distance have been demonstrated to negatively impact on patient outcomes,<sup>32</sup> and this is further supported by our results. Spatial distribution of healthcare providers, transport infrastructure and better local access need to be considered for both urban and regional areas. Increased telehealth services<sup>33</sup> or scaling up current services may be a solution to this issue.

Respondents most commonly sought treatment from physiotherapists (66%), followed by GPs (54%) as their primary care providers. While GPs are an important part of the healthcare system, the multidisciplinary nature of healthcare provides consumers with multiple practitioners who can work together towards the best possible health outcomes. Younger respondents indicated they were less likely to visit their GP and trust the GP-derived information compared with physiotherapists. Our results

are similar to a 2008 study that showed older Australians had a greater trust in GP than adults under 37 years.<sup>34</sup> Our findings could be due to younger people being more aware of the role of physiotherapists in providing musculoskeletal care. However, the lower levels of trust reported and previous studies may also reflect the perception that GPs are perceived to have less interest or expertise in musculoskeletal health, or less understanding of chronic pain in younger people.<sup>35</sup> GPs had 4.8 million musculoskeletal encounters in 2014–2015.<sup>13</sup> An audit of over 1000 GPs indicated that less than 50% of patients with lower limb musculoskeletal conditions, such as osteoarthritis, receive evidence-based care<sup>14</sup> and less than 20% were referred to allied health practitioners or for recommended lifestyle interventions.<sup>36</sup> Our findings indicate a better model of service delivery or increased support for GPs may be required to ensure everyone has access to appropriate evidence-based care.

The rise of the internet and smartphones has resulted in exponential increases in the number of health and wellness apps available.<sup>37</sup> Digital natives (ie, individuals aged less than 35 years) had previously been found to be faster adopters of mobile devices and express greater desire to use mobile and telemedicine applications compared with digital immigrants (ie, those aged older than 35 years).<sup>38</sup> Based on these previous findings, we hypothesised that younger participants may have been searching online or consulting with family or friends for information rather than visiting a GP. Newer trends however suggest older Australians (65+ years) are increasingly accessing online sources for health information.<sup>39</sup> This is supported by our findings where respondents were equally likely to seek healthcare information from an expert website as they were to ask their GP, regardless of age. It may be that people are using digital information to inform their visit to their healthcare professional,<sup>40</sup> rather than replacing the consultation altogether.

More concerning was our finding that respondents trusted information provided through social media to almost the same extent as expert websites. While social media can be a successful platform to promote evidence-based healthcare, the lack of regulatory control pertaining to the type and accuracy of information on social media makes misunderstanding health information a likely possibility, and this can have serious negative health consequences.<sup>37</sup> In addition to increasing efforts to educate the public on appropriate sources of information, more research into factors that influence trust and information-seeking choices is urgently required.

The findings of this study must be viewed within the context of several limitations, including the use of a custom-built survey, and that our convenience sample may not reflect a true random sample from the community. Although we had a good representation across age groups, our results may be influenced by the strong female representation and the proportion of individuals with private healthcare. Overall women experience a greater health burden from musculoskeletal conditions than men,<sup>7</sup> and



our study showed they had greater odds of acting on their healthcare than their male counterparts. This is similar to findings in people seeking care for low back pain.<sup>41</sup> Between 66% and 88% of our sample indicated that they had some form of private health insurance. National survey data indicate that approximately 55% of Australians have some form of private general treatment cover (Australian Institute of Health and Welfare) and that women score higher on health literacy outcomes than males (Australian Bureau of Statistics).<sup>42</sup> Thus, our results may over-represent care-seeking behaviours in Australia. Our results also had limited participation of people from non-English-speaking or culturally diverse backgrounds. We did not target non-internet users, nor ask about non-internet sources of information (eg, leaflets, specialist health support groups) which will reduce the generalisability of our sample. Although recent studies suggest the incidence of people using the internet is increasing, especially in older age groups,<sup>43</sup> there will always be groups for whom access to online materials will be difficult but essential.<sup>44</sup> Last, healthcare utilisation is influenced by a wide variety of factors.<sup>23</sup> While sociodemographics are important influences, multiple other influences need to be considered such as: previous experiences, family, community and complex health beliefs. The factors are beyond the scope of this survey and are important topics for further exploration.

In conclusion, this study highlights the occurrence of longer lasting or severe lower limb musculoskeletal pain in an Australian community cohort. The results suggest our cohort were wary of information provided to them by GPs and other healthcare providers on musculoskeletal issues but were more trusting of physiotherapists. The community were discerning in their trust of information gathered from online or other sources, but this may also create a barrier to distributing accurate information. To move to a more patient-centred approach to healthcare, it may be important for GPs to improve the public's perception of their role in managing musculoskeletal conditions. This information will be of value when planning future community-based and primary care interventions and will be important in efforts to improve the quality of healthcare for lower limb musculoskeletal conditions.

#### Author affiliations

<sup>1</sup>Institute of Bone and Joint Research, The University of Sydney, Sydney, New South Wales, Australia

<sup>2</sup>Department of Rheumatology, Royal North Shore Hospital, St Leonards, New South Wales, Australia

<sup>3</sup>Australian National Centre for the Public Awareness of Science, Australian National University, Canberra, Australian Capital Territory, Australia

<sup>4</sup>Sax Institute, Haymarket, New South Wales, Australia

<sup>5</sup>Department of Health Professions, Macquarie University, Sydney, New South Wales, Australia

**Twitter** David J Hunter @ProfDavidHunter and Luciano Ricardo Melo @sydlBJR

**Contributors** KM and RL conceived the initial project. KM led the development of the survey and methodology with input from JLB, RL, DJH and LRM. All authors assisted with the distribution of the survey. JLB and KM wrote the first and final drafts of this manuscript. All authors (JLB, RL, DJH, LRM, KM) participated in

the trial design, provided feedback on drafts and read and approved the final manuscript.

**Funding** DJH is supported by a National Health and Medical Research Council (NHMRC) Practitioner Fellowship (APP1079777).

**Competing interests** DJH provides consulting advice to Pfizer, Lilly, Merck Serono and TLC Bio.

**Patient and public involvement** Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

**Patient consent for publication** Not required.

**Ethics approval** The study was approved by the Macquarie University Human Research Ethics Committee (No 5201700338) in accordance with the Declaration of Helsinki. All participants provided informed consent.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data availability statement** No data are available. Ethical approval for this study was gained on the basis that data will be used for the current study only and only accessible by the named investigators without requiring protocol amendments.

**Open access** This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

#### ORCID iDs

Jocelyn L Bowden <http://orcid.org/0000-0002-0340-0232>

David J Hunter <http://orcid.org/0000-0003-3197-752X>

#### REFERENCES

- 1 World Health Organization. *Regional office for the Western Pacific. People-centred health care: a policy framework*. Geneva: World Health Organisation, 2007.
- 2 Australian Commission on Safety and Quality in Health Care. *Patient centred care: improving quality and safety by focusing care on patients and consumers*. Sydney: Australian Commission on Safety and Quality in Health Care, 2010.
- 3 Lee K, Hoti K, Hughes JD, et al. Dr Google is here to stay but health care professionals are still valued: an analysis of health care consumers' Internet navigation support preferences. *J Med Internet Res* 2017;19:e210.
- 4 Hillen JB, Vitry A, Caughey GE. Disease burden, comorbidity and geriatric syndromes in the Australian aged care population. *Australas J Ageing* 2017;36:E14–19.
- 5 Britt H, Miller GC, Henderson J. *General practice activity in Australia 2014–15. General practice series No. 38*. Sydney, 2015.
- 6 Sebbag E, Felten R, Sagez F, et al. The world-wide burden of musculoskeletal diseases: a systematic analysis of the world Health organization burden of diseases database. *Ann Rheum Dis* 2019;78:844–8.
- 7 Australian Institute of Health and Welfare. *The burden of musculoskeletal conditions in Australia: a detailed analysis of the Australian burden of disease study 2011. Australian burden of disease study series no 13 BOD 14*. Canberra: AIHW, 2017.
- 8 Smith E, Hoy DG, Cross M, et al. The global burden of other musculoskeletal disorders: estimates from the global burden of disease 2010 study. *Ann Rheum Dis* 2014;73:1462–9.
- 9 Baldwin JN, McKay MJ, Moloney N, et al. Reference values and factors associated with musculoskeletal symptoms in healthy adolescents and adults. *Musculoskelet Sci Pract* 2017;29:99–107.
- 10 Chen J, Devine A, Dick IM, et al. Prevalence of lower extremity pain and its association with functionality and quality of life in elderly women in Australia. *J Rheumatol* 2003;30:2689–93.
- 11 Australian Institute of Health and Welfare. *Rural & remote health, Cat. no. PHE 255*. Canberra: AIHW, 2019.
- 12 Briggs AM, Chan M, Slater H. Models of care for musculoskeletal health: moving towards meaningful implementation and evaluation across conditions and care settings. *Best Pract Res Clin Rheumatol* 2016;30:359–74.
- 13 Pollack AJ, Bayram C, Miller GC. Musculoskeletal injury in Australian general practice: 2000 to 2015. *Aust Fam Physician* 2016;45:462–5.
- 14 Runciman WB, Hunt TD, Hannaford NA, et al. CareTrack: assessing the appropriateness of health care delivery in Australia. *Med J Aust* 2012;197:100–5.



- 15 Dziedzic KS, French S, Davis AM, *et al.* Implementation of musculoskeletal models of care in primary care settings: theory, practice, evaluation and outcomes for musculoskeletal health in high-income economies. *Best Pract Res Clin Rheumatol* 2016;30:375–97.
- 16 Dennis S, Watts I, Pan Y, *et al.* The likelihood of general practitioners referring patients to physiotherapists is low for some health problems: secondary analysis of the Bettering the evaluation and care of health (BEACH) observational study. *J Physiother* 2018;64:178–82.
- 17 Egerton T, Diamond LE, Buchbinder R, *et al.* A systematic review and evidence synthesis of qualitative studies to identify primary care clinicians' barriers and enablers to the management of osteoarthritis. *Osteoarthritis Cartilage* 2017;25:625–38.
- 18 Paterson KL, Harrison C, Britt H, *et al.* Management of foot/ankle osteoarthritis by Australian general practitioners: an analysis of national patient-encounter records. *Osteoarthritis Cartilage* 2018;26:888–94.
- 19 Bunzli S, O'Brien P, Ayton D, *et al.* Misconceptions and the acceptance of evidence-based nonsurgical interventions for knee osteoarthritis. A qualitative study. *Clin Orthop Relat Res* 2019;477:1975–83.
- 20 Kao M-H, Tsai Y-F. Living experiences of middle-aged adults with early knee osteoarthritis in prediagnostic phase. *Disabil Rehabil* 2012;34:1827–34.
- 21 Gignac MAM, Davis AM, Hawker G, *et al.* "What do you expect? You're just getting older": A comparison of perceived osteoarthritis-related and aging-related health experiences in middle- and older-age adults. *Arthritis Rheum* 2006;55:905–12.
- 22 Mann C, Gooberman-Hill R. Health care provision for osteoarthritis: concordance between what patients would like and what health professionals think they should have. *Arthritis Care Res* 2011;63:963–72.
- 23 Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? *J Health Soc Behav* 1995;36:1–10.
- 24 Australian Institute of Health and Welfare. *Australia's health 2018. Australia's health series no. 16, AUS 221.* Canberra, 2018.
- 25 Donaldson A, Finch CF. Planning for implementation and translation: seek first to understand the end-users' perspectives. *Br J Sports Med* 2012;46:306–7.
- 26 Suesse T, Liu I. Modelling strategies for repeated multiple response data. *Int Stat Rev* 2013;81:230–48.
- 27 McPhail SM, Schippers M, Marshall AL, *et al.* Perceived barriers and facilitators to increasing physical activity among people with musculoskeletal disorders: a qualitative investigation to inform intervention development. *Clin Interv Aging* 2014;9:2113–22.
- 28 Thorstensson CA, Gooberman-Hill R, Adamson J, *et al.* Help-seeking behaviour among people living with chronic hip or knee pain in the community. *BMC Musculoskelet Disord* 2009;10:153.
- 29 Thomas SL, Wakerman J, Humphreys JS. Ensuring equity of access to primary health care in rural and remote Australia - what core services should be locally available? *Int J Equity Health* 2015;14:111.
- 30 Australian Bureau of Statistics. *2071.0 - Census of Population and Housing: Reflecting Australia - Stories from the Census, 2016.* Canberra: Australian Bureau of Statistics, 2016.
- 31 Bejleri I, Steiner RL, Yoon S, *et al.* Exploring transportation networks relationship to healthcare access and as affected by urban sprawl. *Transp Res Proc* 2017;25:3066–78.
- 32 Kelly C, Hulme C, Farragher T, *et al.* Are differences in travel time or distance to healthcare for adults in global North countries associated with an impact on health outcomes? A systematic review. *BMJ Open* 2016;6:e013059.
- 33 Hinman RS, Lawford BJ, Bennell KL. Harnessing technology to deliver care by physical therapists for people with persistent joint pain: telephone and video-conferencing service models. *J Appl Biobehav Res* 2019;24:e12150.
- 34 Hardie EA, Critchley CR. Public perceptions of Australia's doctors, hospitals and health care systems. *Med J Aust* 2008;189:210–4.
- 35 Slater H, Jordan JE, Chua J, *et al.* *Young people's experiences of living with persistent pain, their interactions with health services and their needs and preferences for pain management including digital technologies.* Melbourne: Arthritis and Osteoporosis Victoria and Arthritis and Osteoporosis Western Australia, 2016.
- 36 Brand CA, Ackerman IN, Tropea J. Chronic disease management: improving care for people with osteoarthritis. *Best Pract Res Clin Rheumatol* 2014;28:119–42.
- 37 Boulos MNK, Brewer AC, Karimkhan C, *et al.* Mobile medical and health apps: state of the art, concerns, regulatory control and certification. *Online J Public Health Inform* 2014;5:229.
- 38 Naszay M, Stockinger A, Jungwirth D, *et al.* Digital age and the public eHealth perspective: prevailing health APP use among Austrian Internet users. *Inform Health Soc Care* 2018;43:390–400.
- 39 Research Australia. *Australia speaks! Research Australia opinion polling 2016, 2016.*
- 40 Lee K, Hoti K, Hughes JD, *et al.* Dr Google and the consumer: a qualitative study exploring the navigational needs and online health information-seeking behaviors of consumers with chronic health conditions. *J Med Internet Res* 2014;16:e262.
- 41 Ferreira ML, Machado G, Latimer J, *et al.* Factors defining care-seeking in low back pain - A meta-analysis of population based surveys. *Eur J Pain* 2010;14:747.e1–7.
- 42 Australian Bureau of Statistics. *4364.0.55.014 - National Health Survey: Health Literacy, 2018.* Canberra: Australian Bureau of Statistics, 2018.
- 43 Rideout V, Neuman T, Kitchman M, *et al.* *E-Health and the elderly: how seniors use the Internet for health information.* Washington: Kaiser Family Foundation, 2005.
- 44 Gordon NP, Hornbrook MC. Older adults' readiness to engage with eHealth patient education and self-care resources: a cross-sectional survey. *BMC Health Serv Res* 2018;18:220.