The OARSI Joint Effort Initiative: Priorities for osteoarthritis management program implementation and research 2024–2028

Jocelyn L. Bowden [a,*], David J. Hunter [a], Kathryn Mills [b], Kelli Allen [c,n], Kim Bennell [d], Andrew M. Briggs [e], K. Dziedzic [f], Rana S. Hinman [d], Jason S. Kim [g], Nina Martinez [h], Jonathan G. Quicke [i,j], Bryan Tan Yijia [k], Martin van der Esch [l], Josep Verges [m], Jillian Eyles [a]

[a] Sydney Musculoskeletal Health, Kolling Institute, Faculty of Medicine and Health, The University of Sydney and the Rheumatology Department, Royal North Shore Hospital, Northern Sydney Local Health District, Sydney, NSW, Australia
[b] Faculty of Medicine, Health and Human Sciences, Macquarie University, Australia
[c] Department of Medicine and Thurston Arthritis Research Center, University of North Carolina at Chapel Hill, USA
[d] Centre for Health, Exercise and Sports Medicine, Department of Physiotherapy, The University of Melbourne, Melbourne, Victoria, Australia
[e] Curtin School of Allied Health, Curtin University, Perth, Western Australia, Australia
[f] Impact Accelerator Unit, School of Medicine and Health Sciences, Keele University, Keele, Staffordshire, UK
[g] Arthritis Foundation, Atlanta, GA, USA
[h] Department of Research and Development, Osteoarthritis Foundation International, Barcelona, Spain
[i] Chartered Society of Physiotherapy, Chancery Exchange, London, UK
[j] School of Medicine, Keele University, Keele, UK
[k] Department of Orthopaedic Surgery, Woodlands Health, National Healthcare Group, Singapore
[l] Faculty of Health, Amsterdam University of Applied Sciences, Reade, Center for Rehabilitation and Rheumatology, Amsterdam, the Netherlands
[m] President of the Osteoarthritis Foundation International, Barcelona, Spain
[n] Durham Department of Veterans Affairs Health Care System, USA

ARTICLE INFO

ABSTRACT

Objective: The Joint Effort Initiative (JEI) is an international collaboration of clinicians, researchers, and consumer organisations with a shared vision of improving the implementation of osteoarthritis management programs (OAMPs). This study aimed to identify JEI's future priorities and guide direction.

Design: A two-part international survey to prioritise topics of importance to our membership and research stakeholders. Survey one presented a list of 40 topics under 5 themes. Consenting participants were asked to choose their top three topics in each theme. A short list of 25 topics was presented in survey two. Participants were asked to rank the importance (100-point NRS scale, 100 = highest priority). Response frequency (median, IQR) was used to rank the top priorities by theme.

Results: Ninety-five participants completed survey one (61% female, 48% clinicians) and 57 completed survey two. The top ranked topic/s were:

i. Promotion and advocacy: support training for health professionals (median 85, IQR 24).

ii. Education and training: incorporating behaviour change into OAMPs (80, 16), advanced OA skills (80, 30), and integration of OA education into clinical training (80, 36).

iii. Improving OAMPs delivery: regular updates on changes to best-evidence OA care (84, 24).

iv. Future research: improve uptake of exercise, physical activity, and weight-loss (89, 16).

v. Enhancing relationships, alliances, and shared knowledge: promote research collaborations (81, 30), share challenges and opportunities for OAMP implementation (80, 23).

Conclusions: These topics will set the JEI's research and collaboration agenda for the next 5 years and stimulate ideas for others working in the field.

* Corresponding author. Sydney Musculoskeletal Health, Kolling Institute, Faculty of Medicine and Health, The University of Sydney and the Northern Sydney Local Health District, Level 10, Kolling Building, Reserve Road, St Leonards, 2065, Sydney, NSW, Australia.
  E-mail addresses: Jocelyn.bowden@sydney.edu.au (J.L. Bowden), david.hunter@sydney.edu.au (D.J. Hunter), kathryn.mills@mq.edu.au (K. Mills), kdallen@email.unc.edu (K. Allen), k.bennell@unimelb.edu.au (K. Bennell), a.briggs@curtin.edu.au (A.M. Briggs), k.s.dziedzic@keele.ac.uk (K. Dziedzic), ranash@unimelb.edu.au (R.S. Hinman), jkim@arthritis.org (J.S. Kim), research@oafifoundation.com (N. Martinez), j.g.quicke@keele.ac.uk (J.G. Quicke), btanyj@hotmail.com (B. Tan Yijia), m.vd.esch@reade.nl (M. van der Esch), jverges@oafifoundation.com (J. Verges), jillian.eyles@sydney.edu.au (J. Eyles).

1. Introduction

International guidelines make clear, consistent recommendations for the management principles and core evidence-based treatment for osteoarthritis (OA). These include tailoring care to the needs and expectations of the individual and delivering the core components of education for OA self-management; exercise and physical activity; and weight-loss for people with hip or knee OA who are above a healthy weight [1]. Pharmacological, other adjunctive and surgical treatments can be used if necessary, and if appropriately indicated. Key considerations to ensure OA care is successfully delivered include ensuring support for people with complex presentations, enabling interprofessional or multidisciplinary input when required, and ensuring care is coordinated and integrated between the different health professionals and health services involved [2].

Structured OA management programs have been implemented to deliver tailored, evidence-based care in real-world settings [3,4]. OA management programs can be delivered in many different formats (e.g. in-person or virtually, to a group or individual), and have been defined previously as including a personalised package of OA care, with reassessment over time and treatment progression [5]. The components of care should offer two or more of the core lifestyle and behavioural interventions, but may also offer optional evidence-based treatments as required, including psychosocial, pharmacological or other physical interventions [5].

The *Joint Effort Initiative for the implementation of osteoarthritis management programs* (JEI) was established in 2018 under the auspices of the Osteoarthritis Research Society International (OARSI). The JEI is an international consortium of clinicians, researchers, and consumer and patient organisations with a shared vision of improving the international implementation of OA management programs. The umbrella objective was to ensure that people with OA across the globe receive the highest quality, best-evidence care that is appropriate to the setting and available resources. To do this at a global scale, we aimed to make recommendations for the 'best' methods of implementing OA management programs. The JEI's initial charter was to provide a forum to learn from the experiences of leaders in the field with a focus on optimising the quality and delivery of care at the clinical service level, developing health professional training, fostering international research collaborations, and minimising duplication of effort and resources. Other underlying objectives were to promote work by early- and mid-career researchers, and to better understand the issues around OA care in low- and middle-income countries (LMICs) and other low-resourced settings [6] to help address care disparities.

The priorities for the JEI's first five years (2018–2022) were guided by an international survey and consensus exercise [5]. From this, the JEI identified four priority areas, namely i) providing guidance around improving implementation of OA management programs, ii) developing a set of outcome measures for OA management programs [7], iii) developing core capabilities for healthcare professionals involved in delivering OA care [8], and iv) developing and accessing an education and training program for health professionals delivering OA care [9,10]. A special collaborative project between the JEI and the OA Trial Bank also established the first international data bank of individual participant data (IPD) collected from real world OA management programs [11]. Work is currently ongoing to analyse this dataset to identify prognostic factors influencing outcomes of people who participate in these programs.

One of the strengths of the JEI is the international, multi-disciplinary collaborations that have evolved. Over the last 5 years, work by our members and wider networks have conducted studies that meet many of our priority research areas. Much of this work has been focused on implementing new models of care for OA management programs [12–15], many with a growing emphasis on using technology to improve program access [16–19]. Similarly, we have noted increased attention on evaluation and strengthening the delivery of existing programs [20–23],

including studies that identify barriers and facilitators to implementation [24–26] or that are specific to local regions [12,27,28].

As many of the initial projects that arose from the first survey are now either complete or approaching completion [7–9,11], the JEI Steering Committee (the authors of this paper) aimed to undertake a new priority setting exercise to guide our direction for the next 5 years (2024–2028) informed by a survey among people involved with these programs. This paper presents the survey findings and discusses potential actions.

2. Method

An overview of the survey process is outlined in Fig. 1. Ethical approval was granted by the Human Research Ethics Committee of the University of Sydney (2022/766, 7/11/2022), and the procedures followed were in accordance with the Helsinki Declaration of 1975, as revised in 2000. Two surveys (Appendix 1) were circulated between November 8, 2022 and February 3, 2023. Participation was voluntary and responses were anonymous. A participant information sheet was provided electronically as part of the survey process, and submission of a completed survey was considered informed consent to participate. The study has been reported in accordance with the Reporting guideline for priority setting of health research (REPRISE) [29].

2.1. Participants and recruitment

Participants were recruited for survey 1 via an email with an embedded survey link. To broaden our reach compared to the 2018 survey, the email was sent to all members on the JEI mailing list (n = 281) and to other key contacts in the Initiative's research, clinical, policy and consumer networks (e.g. Arthritis Australia, USA Arthritis Foundation, Osteoarthritis Action Alliance, OA Foundation International). Two follow-up emails were sent with a reminder of the survey closing date. To recruit participants outside the regular JEI networks (e.g. other clinicians, policy makers, people with OA), the survey was advertised on our social media accounts (Twitter, Facebook). The only inclusion criteria were that participants were 18 years of age or above, and were a member of the JEI, one of our partners, or had been involved with OA programs before. Survey 1 participants who consented to further contact, were subsequently emailed an invitation to survey 2. There was no reimbursement for participation in the survey.

2.2. Survey design

The two custom-designed surveys were developed and administered using the REDCap Research Electronic Data Capture tool hosted at the University of Sydney (Supplementary information). REDCap is a secure, web-based application designed to support data capture for research studies [30]. From survey 1 we aimed to create a short list of the most important topics participants thought should be addressed to improve the implementation of OA management programs, while survey 2 was designed to enable ranking and prioritisation of those topics for action.

Survey 1 was open for 12 weeks and took approximately 10 min to complete. Participants were presented with a list of 40 potential topics for consideration, that were presented under five themes. We aspired to provide participants with a range of topics that covered expansions to the work the JEI had already completed, work that had been identified as important but not yet addressed, and topics related to new directions for the JEI. The prospective topic list was initially generated from discussions with participants at the 2022 JEI Discussion Group Meeting (hybrid event, 71 participants, 20 countries, 6 UN geographic regions). Participants were asked to provide ideas for topics, actions or activities that the JEI could consider for future work. Discussions were based around the eight pillars from the *Framework for strengthening health systems* as proposed by Briggs and colleagues [31], and that replaced the *Donabedian framework for quality assessment in healthcare* that informed the 2018 survey [32]. To ensure a wide range of ideas were included, the initial list

was supplemented with data identified through minutes or recordings/transcripts of other JEI events, JEI publications or discussion with others, including from the 2021 JEI Discussion Group Meeting, JEI-hosted workshops on "Patient and Public Involvement" (2022) and "Delivering OA Care around the World" (2021) [6], and from discussions with the JEI Steering Committee, our existing working groups, and our partner organisations. Topics and suggestions were included if they fell within the remit of the JEI (i.e., related to delivery of OA management programs), but were excluded if they fell outside the JEI's scope (e.g., the effectiveness of medications). All topics identified were mapped onto the Briggs framework (JB/JE/KM) with similar topics merged into a single statement. To simplify the topics for survey presentation and ease of voting, the framework was ultimately reduced to five themes and the statements converted to plain English. The survey questions and structure were reviewed by the JEI Steering Committee (the authors of this paper) for accuracy, appropriateness and completeness in September 2022.

The five themes presented were:

i) *Promotion and advocacy:* priority topics or actions that the JEI Steering Committee should advocate for,

ii) *Education and Training:* New or expanded training and educational activities,

iii) *Clinical delivery of OA management programs:* priority topics or activities to improve clinical delivery in real world settings,

iv) *Future research:* Priority research topics to improve implementation of OA management programs,

v) *Enhancing relationships, alliances, and shared knowledge*: activities or resources to enhance the collaboration and optimise the shared knowledge of the group.

In survey 1, participants were asked to select a maximum of three topics (via tick boxes) under each theme that they considered to be the most important for the JEI to pursue. Between six and twelve options were offered for each theme. Additional open questions were included at the end of each theme to allow participants to suggest additional topics. Data were also collected at this stage on participant demographics, any prior experience with OA management programs and any prior involvement with JEI activities (Table 1). Brief demographic data on the OA management programs that participants worked with were also collected (Table 2).

Survey 2 was circulated on February 4, 2023 and remained open for three weeks. Participants were presented with five topics under each theme, and they were asked to assign a level of priority for each individual topic on a 100-point visual analogue sliding scale that represented their opinion on the priority topics for the JEI to deliver (0 = lowest to 100 = highest priority). The list comprised the top five topic responses in each theme as identified from survey 1. All five topic under each theme were presented on a single page and participants were able to give the same score to multiple topics. The free-text collected in survey 1 were
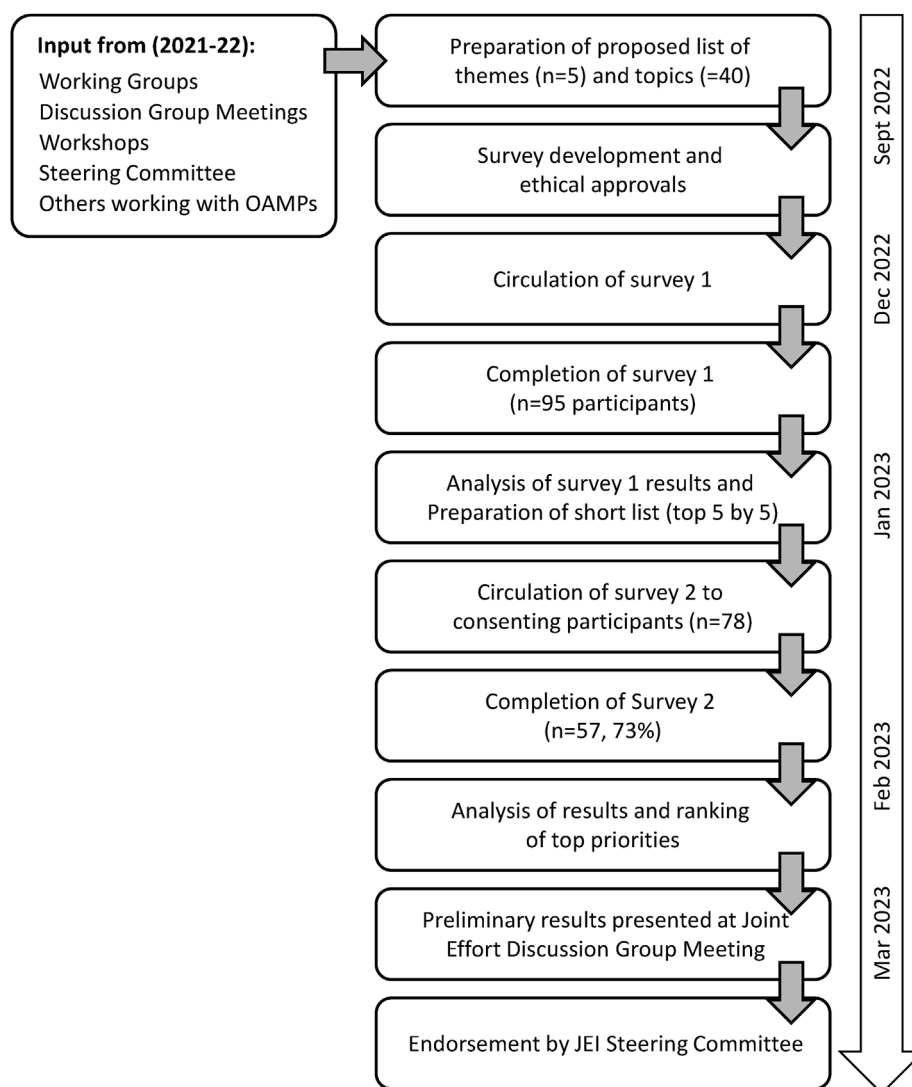

Fig. 1. Overview of the survey and prioritisation process. JEI = Joint Effort Initiative, OAMP=Osteoarthritis Management Program.

Table 1

Participant demographics for survey 1.

	Survey 1 n (%) unless otherwise stated
Total completed responses	95
Age *(years, mean 95% CI)*	48.2 (45.0–51.4)
Sex, *Female*	58 (61%)
Region	
Africa	1 (1%)
Asia	10 (11%)
Europe/UK	32 (34%)
Oceania	27 (28%)
North America	19 (20%)
Latin America and the Caribbean	6 (6%)
Currently working in low or middle-income countries (LMIC), *yes*	13 (14%)
Profession	
Allied Health	49 (52%)
Medical	21 (22%)
Scientist	7 (7%)
Other	18 (19%)
Current role[a]	
Allied Health	18 (19%)
Medical	23 (24%)
Researcher	63 (66%)
Educator/lecturer	13 (14%)
Public health/policy	6 (6%)
Consumer Group Representative	5 (5%)
Person with OA	6 (6%)
Research funder	3 (3%)
Other	2 (2%)
Practicing clinician, *yes*	46 (48%)
Involved in research, *yes*	85 (89%)
Highest degree	
PhD	52 (55%)
Enrolled in PhD	8 (8%)
Masters by research	10 (11%)
MD	11 (12%)
Bachelor's Degree	6 (6%)
Other	8 (8%)

Demographic data were collected in survey 1.

[a] Designates multiple answers were permitted for that question.

Table 2

Characteristics of participant's OA management programs reported in survey 1.

	N (/95)	%
No. participants who reported being involved with an OA management program (survey 1).	68	72%
Years of experience with OA management programs, years (mean, 95% CI)	7.7 (5.9–9.4)	–
Stage of implementation (n = 84)		
Planning	14	15%
Piloting/testing program in a clinical trial	12	13%
Piloting/testing program in a real-world setting	10	11%
New program and growing	12	13%
Established and stable program	34	36%
Other	2	2%
Setting or potential setting of OA management program? (n = 144)[a]		
Community program	26	33%
Primary care	26	33%
Private clinic	11	14%
Public hospital	32	40%
Private hospital	9	11%
University clinic	13	16%
Clinical trial (research program)	21	26%
Commercial program	3	4%
Other (please specify below)[b]	3	4%

As responses were anonymous, we were unable to report the exact number of people outside the JEI membership who participated.

[a] multiple answers permitted.

[b] Other: across health systems, for private health insurance.

reviewed (JB/JE) to determine if additional questions should be added to survey 2. It was felt that the additional suggestions fell within the remit of the existing questions, and no addition questions were added.

2.3. Data analysis

Only complete and submitted surveys were included in the analysis. Individual data was anonymous and were exported to Excel and SPSS (version 27) for final analysis. Descriptive statistics were used to summarise demographic and survey data. For survey 1, data were analysed, ranked by the frequency of responses received for each topic, and the top five responses per theme were included in survey 2. The final priorities were ranked by median score (interquartile range, IQR) for each topic, and presented by theme.

The free text responses were examined by two of the authors (JB/JE) to check for overlap with existing topic headings and to draw out any additional topics that should be included in survey 2. As the primary aim of this survey was to generate feasible topics for the JEI to deliver, we also identified suggestions that were too complex, required substantial resources or investment, or that were currently beyond the JEI's scope. These suggestions were not included as new options in survey 2 but have been reported separately.

3. Results

3.1. Participants

Ninety-five participants completed survey 1. Seventy-five participants consented to be contacted for survey 2, and 57 (76%) submitted a completed survey. Participant demographics are summarised in Table 1. Overall, there were no major differences in the characteristics of participants who completed the two surveys. The mean participant age was 48.2 years (95% CI 45.0 to 51.4). We had more female participants (61%) than males, and more than half reported an allied health background (>50%). Forty-eight percent of participants were practicing clinicians, 89% were actively involved in research, and >60% held or were completing a PhD. Six people with OA completed the survey, and we also recruited people who worked with public health policy (n = 6), OA consumer groups (n = 5) and research funding agencies (n = 3). Seventy-one (75%) participants reported prior participation in at least one JEI activity. As the survey was anonymous, we were unable to estimate the exact number of people outside the JEI membership who participated.

Participants represented 21 countries, with the majority from the UN regions of Oceania (28%), Europe and the UK (34%), and North America (20%). There was less representation from Asia (11%), Latin America and the Caribbean (6%) and Africa (1%). Thirteen participants (14%) were currently working in LMICs.

3.2. Characteristics of OA management programs that participants were involved with

Sixty-eight participants (72%) reported being involved with an OA management program (mean 7.7 years, 95% CI 5.9 to 9.4). The program characteristics are summarised in Table 2. The main settings were public hospitals (n = 32), primary care (n = 26), and community settings (n = 26). An additional 21 participants reported being involved with OA management programs at the clinical trial stage. Two respondents reported working in a private health insurance program, and across national health systems.

3.3. Priorities for future work of the JEI

The final ranked list of topics under each theme are presented in Table 3 and Fig. 2. Briefly, the top three priorities in each theme were.

Table 3
Ranking of topics in each theme after Survey 2.

Overall Ranking	Theme and topic	Survey 1% responses received (n = 95)	Survey 2 (/100) Median Score (n = 57)	Survey 2 IQR
1. Promotion and Advocacy: Priority areas that the JEI Steering Committee should support				
1	Develop resources and training for health professionals to ensure delivery of high-quality osteoarthritis care.	57%	85	24
2	Support best-practice implementation of osteoarthritis care and promote OA international clinical guidelines.	66%	82	29
3	Support implementation strategies that ensure diversity and inclusion in osteoarthritis care.	49%	80	24
4	Provide leadership on addressing social and environmental determinants of health in osteoarthritis care.	42%	75	37
5	Provide leadership in promoting Public and Patient Involvement (PPI) in osteoarthritis care.	35%	70	26
n/a	Work collaboratively with other organisations promoting evidence-based osteoarthritis care.	33%	–	–
n/a	Advocate internationally for better OA Management Program operational funding models.	29%	–	–
2. Education and training activities				
1	Training in how to include behaviour change methodology in OA Management Programs.	56%	80	16
2	Training programs for advanced OA skills and/or extended scope of practice for clinicians delivering OA care.	61%	80	30
3	Integration of OA educational programs into undergraduate/post graduate programs (e.g. University level).	45%	80	36
4	A Community of Practice for clinicians delivering OA care.	48%	73	23
5	Training in how to address Social and Environmental Determinants of Health in OA management programs.	42%	68	24
n/a	Standardised communication skills training.	14%	–	–
3. Clinical delivery and implementation of OA management programs				
1	Regular updates on changes to best evidence care (e.g. new evidence).	42%	84	24
2	Guidance on addressing multi-morbidity in OA Management Programs (e.g. polypharmacy affecting ability to engage, contraindications).	36%	81	16
3	New ways to deliver OA Management Programs outside of formal health settings (e.g. how to develop community networks).	45%	80	23
4	Guidance on how the basic components of OA Management Program can be adapted for different care settings.	45%	79	35
5	Guidance on tailoring programs to suit a range of socioeconomic conditions.	34%	75	29
n/a	Guidance on addressing poor health literacy.	28%	–	–
n/a	Guidance on delivering OA management programs via telehealth or virtual care.	28%	–	–
n/a	Guidance on how to better use community resources and the local neighbourhood to improve person-centred care.	27%	–	–
n/a	Create a task force to seek the consumer (patient) views and ensure public input into OA Management Programs.	22%	–	–
4. Future research				
1	Trialling new ways to promote uptake of exercise, physical activity, and weight-loss.	47%	89	16
2	Developing quality indicators for OA care delivered by health professionals.	31%	80	20
3	Trialling new implementation methods for international OA management guidelines.	34%	80	27
4	Comparison of the clinical & cost effectiveness of different OA Management Programs.	35%	80	30
5	Trialling new models or pathways of care for OA Management Programs.	29%	78	24
n/a	Testing hybrid models of care.	26%	–	–
n/a	Trialling new ways to address personal psychosocial factors affecting OA care.	24%	–	–
n/a	Trialling new chronic pain management strategies.	18%	–	–
n/a	Improving integrating assessment and management of social determinants of health in OA management program.	19%	–	–
n/a	Research into the social determinants of health that contribute to poor OA health outcomes.	18%	–	–
n/a	Greater focus on care for other joints (e.g. hand, ankle).	17%	–	–
n/a	If the addition of adjunctive therapies to the core treatment add value or improve the outcomes of OA management program.	14%	–	–
5. Enhancing relationships, alliances, and shared knowledge				
1	Promoting greater research collaborations.	46%	81	30
2	Sharing challenges and opportunities of OA Management Program implementation (e.g. workshops showcasing different programs).	52%	80	23
3	Methods to ensure successful monitoring and evaluation of program outcomes.	51%	77	16
4	Training on how to involve consumers (patients) and public in the design of OA Management Programs (e.g. workshops).	39%	73	27
5	Research methods in implementation science.	48%	72	30
n/a	Mentoring on OA management program delivery by an experienced clinician.	27%	–	–

Results are presented as the highest ranked priority topics identified by survey 2 (median, interquartile range (IQR). A higher mean score indicates more participants rated this action as a higher priority. Survey 1 results show as the percentage (%) of participants who selected this topic as a top 3 priority in survey 1. n/a = topic was not included in survey 2.
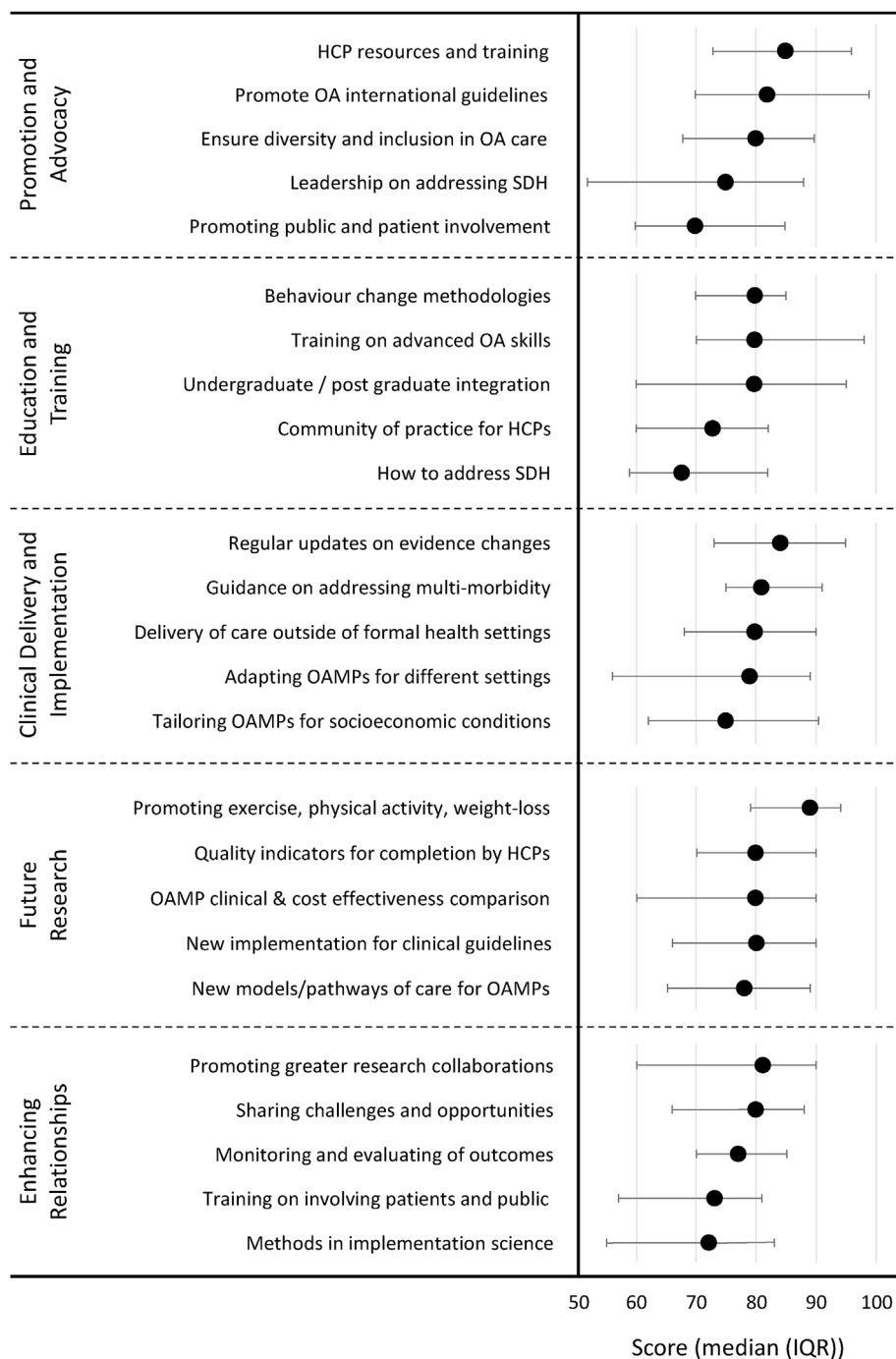
Fig. 2. Top five topics identified in each theme for priority action by the JEI. Participants were asked to provide their priority score for each topic on a 100-point visual analogue sliding scale (0 = lowest to 100 = highest priority). Results are presented in order from highest to lowest ranked topic, by theme. Results are presented as median and interquartile range (IQR). Maximum possible score is 100.

i) *Promotion and advocacy by the JEI Steering Committee:* The top ranked priority under this theme was to continue support for development of resources and training for health professionals to ensure delivery of high-quality OA care (median on 100-point NRS: 85, IQR 24). The next two priorities were continued support and promotion of best-practice OA care and international clinical guidelines (82, 29), and to support implementation strategies that ensured diversity and inclusion in OA care (80, 24).

ii) *Education and training:* The top three priorities in this theme received the same median score. They were to develop training on including behaviour change methodologies in OA management programs (80, 16), training programs for advanced OA care skills

and/or extended scope of practice (80, 30), and greater integration of OA educational programs into undergraduate and postgraduate clinical training programs (80, 36).

iii) *Improving delivery of OA management programs (clinical considerations):* Provision of regular updates on changes to best-evidence OA care was ranked as the highest priority (84, 24). It was followed by guidance on addressing multimorbidity within OA management programs (81, 16), and guidance on new ways to deliver OA management programs outside of formal health settings, for example, better integration into the community (80, 23).

iv) *Future research priorities:* The top future research priority was trialling new ways to promote the uptake of exercise, physical

activity, and weight-loss (89, 16). The next three topics received the same score, including developing quality indicators so health care professionals can rate their own care (80, 20), undertaking more studies to trial new models/pathways of care for OA management programs (80, 27), and studies comparing the clinical and cost-effectiveness of different OA management programs (80, 30) to guide policy and service delivery.

v) *Enhancing relationships, alliances, and shared knowledge:* The two highest-ranked priorities were: continue to promote research collaborations across the JEI (81, 30), and share challenges and opportunities for OA management program implementation between different programs (80, 23). Methods to ensure successful monitoring and evaluation of OA management program outcomes (77, 16) was the third highest-ranked topic.

3.4. Additional free text topics

The majority of free text responses were assessed as falling within the scope of current questions. Eighteen additional topics were considered beyond the capacity of the JEI to deliver and are summarised in Table 4.

4. Discussion

Since the JEI was established in 2018, it has delivered key projects intended to improve the implementation of OA management programs (Table 5). Moving forward, our survey results suggest there is an increasing need to move beyond the traditional randomised controlled effectiveness trials towards more pragmatic studies that can ensure the delivery of the right care, to the right person, at the right time, and with a clear focus on reducing health inequity through explicit consideration of social determinants of health (SDH), especially in low-resourced settings. SDH are any contextual factors or settings associated with where people live, work, play and socialise, and they cover a wide spectrum including lifestyle, personal circumstances, psychosocial, socioeconomic, and built environment factors [33]. Greater consideration of SDH factors for people with OA has been flagged in the upcoming Lancet Commission on OA to ensure equity and equality of care [34], and is a growing topic of importance within the JEI community [e.g. [33,35,36]]. We present the findings of our survey below with a focus on directions for the JEI's work, and where relevant we have identified potential SDH factors for further consideration.

Education and training for health professionals delivering care has been a significant component of the JEI's work to date. We developed a *trans*-disciplinary, skills-based capability framework for health professionals [8,9], and used this as a framework for the OA Health

Table 4

Additional topics for consideration as provided in free text fields.

Equity in OA care and outcomes, including lobbying governments for changes to health system funding barriers to enable access to OA management programs, and training for clinicians and researchers on how to effectively lobby for change. Bring together patient stories (lived experience), service impact data and economic evaluation to build impactful arguments for policy change.
Cultural diversity and inclusion/adaptation for local OA management programs, cultural relevance, and appropriateness of programs in multi-cultural countries.
Efficacy of alternative therapies, particularly for use in LMICs or under-resourced settings.
Unified ways to evaluate disease severity from the person with OA's perspective, models of care embracing their understanding and participation, and care options driven by the person with OA, improving referrals from family doctors.
Evidence based unified assessments of severity for OA joint problems.
Socioeconomic value of OA management programs.
Biomechanics discussion group, to discuss about some interventions.
Alternative workforce models for delivering OA management programs
Consideration of system factors in addition to service delivery.
Evaluating the effectiveness of implementation activities.
Holistic management or whole-body awareness.

Similar suggestions have been merged, suggestions beyond the remit of the JEI or that are included in topics presented in Table 3 have not been included.

Professional Training manual [10]. The development of the Arthritis Training, Learning And upSkilling for health professionals (ATLAS) eLearning course is also built around the capability framework and is due for completion in 2024 [9]. The JEI's Training and Education Working Group is currently engaging with professional bodies and educational institutions with the view to deliver this training as micro-credentialled courses for health professionals wishing to learn basic or advanced OA care skills or gain knowledge within and beyond their usual scope of practice.

Our survey participants expressed significant support for expanding this work, particularly to ensure that the clinicians of tomorrow have the skills, knowledge, and confidence to deliver appropriate OA care. Recent reports suggest that new physiotherapy and medical graduates feel they lack the skills and confidence to provide care for chronic musculoskeletal conditions, including OA [37]. Briggs and colleagues [37] suggest many graduates are insufficiently equipped to deal with the increasing OA burden and recommend core competencies for OA care are included in pre-licensure courses for all health disciplines. However, as current curriculum content in many entry-to-practice courses are already overcrowded [38], fitting new content into these programs could be challenging. Revision of existing curricula may be a more realistic option, for example, ensuring musculoskeletal pain concepts are fully integrated into chronic disease management training. The focus in low-resourced settings (e.g. LMICs) may be different however, where the emphasis may be on addressing health inequities by training members of the existing health workforce to deliver OA care considered to be beyond their traditional scope of practice [6].

A first step may be to identify what is currently being taught, where the best opportunities for change lie, and who is best placed to deliver this content. Many of the core materials already exist, but there may be a lack of awareness around their existence, or they may need to be updated and/or adapted to suit different contexts. With the move away from textbooks and other printed materials in many countries, a myriad of opportunities for different delivery methods may exist, including better incorporation of health professionals with expert knowledge into existing learning pathways, embedding public health interventions or utilising authentic learning experiences. For example, Springfield College in the USA embedded the US Arthritis Foundation's "Walk with Ease" self-management program into their post-graduate Physical Therapy curriculum [39]. Walk with Ease is an example of a low-cost self-management program that can be easily utilised to provide OA education and promote physical activity outside the clinic. It has been successfully adapted for Spanish speaking populations, and has been distributed by more than 20 US state-level public health offices with the support of the USA Center for Disease Control [40]. Walk with Ease has provided a much-needed walking program for the local community [39], while giving Physical Therapy students hands-on experience using health coaching and behaviour change methodologies that underpin successful education for OA self-management [10].

Our results showed our participants felt training around how to implement behaviour change strategies into their program delivery was an important priority. Behaviour change as a general concept is relatively easy to understand but is harder to deliver as a health professional in clinical practice, and even harder to adopt as a person with OA. So while the JEI strives to embed behaviour change principles in its current work, we suggest an increased focus should be on providing guidance on 'how to implement' behaviour change in addition to providing the underlying 'theories and frameworks' [41]. Provision of practical and diverse case studies (such as Walk with Ease), example scripts with recommended language and showcasing strategies for use in different settings, may be practical approaches that the Initiative could readily deliver, thus increasing the motivation of health professionals to integrate these strategies within their programs.

It has been encouraging to see work around the continued testing of new OA management programs [12–15], and with others in the design and piloting phase (Table 1). The JEI sees ongoing development and

Table 5
Publications and activities delivered by the JEI against the 2018–2023 priorities.

Top Priorities 2018–2023	Publications and other activities delivered
1. Guidelines for the implementation of different OA management programs to ensure consistency of delivery to international best-practice.	• Resource Repository: Resources repository of evidence-based online osteoarthritis management programs for clinicians delivering care: a rapid response during COVID-19 [52] • Resource Repository: Joint Action podcast and repository of online resources for people with OA https://www.jointaction.info/podcast • Bi-monthly international shared learning sessions hosted by the Implementation working group.
2. Develop and assess training & education programs for health professionals delivering OA management programs.	• A framework to guide the development of health care professional education and training in best evidence OA care [9] • Osteoarthritis Health Professional Training Manual [10] • Arthritis Training, Learning And upSkilling for health professionals (ATLAS) eLearning program (in development)
3. Develop and evaluate the implementation and outcomes of novel models of OA management programs.	• Evaluating Osteoarthritis Management Programs: Outcome Domain Recommendations from the OARSI JEI [7] • Clinical Outcomes Of Osteoarthritis Management Programs: A Project Of The OA Trial Bank And OARSI JEI Using Individual Participant Data [11] • Individual Participant Data Dataset from OA management programs (www.oatrialbank.com) • Clinical trials and cohort studies undertaken by JEI members on novel models of care [14,46,53]
4. Develop and assess core skill sets and resources for health professionals delivering OA care.	• Development of a core capability framework for qualified health professionals to optimise care for people with osteoarthritis: an OARSI initiative [8]
5. Develop a framework for enhancing the quality of care provided by OA management programs.	• No work undertaken on this topic to date.
6. Other	• Implementation of Best-Evidence Osteoarthritis Care: Perspectives on Challenges for, and Opportunities From, Low and Middle-Income Countries [6] • Realizing Health and Well-being Outcomes for People with Osteoarthritis Beyond Health Service Delivery [33] • Osteoarthritis Research Society International Pre-Congress Workshop. Implementing Osteoarthritis Management Programs around the World. 2021 • Osteoarthritis Research Society International Pre-Congress Workshop. International Patient and Public Involvement and Engagement for improved Quality of Osteoarthritis Care, 2022.

adaption of OA management programs as a continuing priority, including the adaption of existing programs to suit different contexts, including for the needs of LMICs and lower-resourced settings. The traditional development and testing cycle for these programs could be supplemented with more 'natural experiences' and 'citizen science projects' to give greater, contextual, and mechanistic insights into the realities of delivering real-life programs. It is also important to ensure that the mechanisms of impact and cost-effectiveness of these programs are also documented, including greater co-publication of process and economic evaluations with the clinical trial results, and that report the actual context of the implementation [42]. Currently, not all studies produce process or economic evaluations, and often those that do either lack visibility due to poor labelling, have a narrow focus on patient adherence, or reported the qualitative results without detail around the recommended implementation measures [43–45]. The process evaluation for the Norwegian SAMBA model of care [46,47], is a good example of how implementation issues can be reported. From a JEI perspective, advocating for clearly labelled process and economic evaluations to accompany all trials, and providing training and advice around how to design and report these types of trials, may be appropriate actions.

Supporting the uptake of exercise, physical activity, and weight-loss is a challenging component of delivering OA care [48]. As such, it was not surprising that trialling new ways to promote uptake of these core components was ranked highly. New research is not needed to show the effectiveness of these interventions on pain and function [49], rather new strategies are needed to encourage uptake and adherence, and that simultaneously address the increasing need for OA care. For example, there is growing recognition that to ensure desired behaviour change, OA care needs to move beyond the individual and include family or close social networks, whole of community, and whole of government responses [34]. As such, the JEI advocates for a stronger shift towards implementation research that extends beyond the traditional clinical settings, particularly those that embrace community-oriented solutions. Many SDH factors may need to be addressed at policy or service delivery levels within individual countries, however, there are many areas where the JEI could potentially play a leading role. Co-designing and tailoring programs to ensure inclusivity across diverse and underserved groups in society is one example of how the JEI can champion strategies to reduce inequity. Promotion of healthcare into the community, including that delivered by local healers or community services has been identified as important to improve care delivery in some settings [6], yet they are rarely included in OA care models. Research into which SDH factors are considered important for different people attending OA management programs, and how these can be implemented are important research questions for the JEI to ponder and may provide a solution to improving the uptake and adherence to core OA treatments. Regardless, ensuring that SDH are adopted as an underlying tenet is essential for the JEI moving forward.

An interesting finding from our recently published work around the domains required for the evaluation of OA Management Programs, was that "the ability to participate in daily activities" was identified as the most critical domain [7]. The authors found it noteworthy that amongst the large number of domains considered important, a person-level and person-centred domain was viewed as the most important, ranking higher than traditional measures such as pain, physical function and quality-of-life. Participation may include participation in social, recreational, and occupational activities, or viewed more generally as 'participation in life'. We know that social participation and context are critical factors influencing pain, yet are inadequately considered in research [50]. One major barrier to participation that requires further investigation is the presence of multimorbidity. Multimorbidity poses a healthcare burden on the individual and likely influences whether someone with OA is able to fully engage in an OA Management Program, or other aspects of their life such as physical activity [51]. Our results show that guidance on addressing multimorbidity in OA management programs was a high priority (Table 3). Consequently, we advocate that all future activities of the JEI have a strong focus on ensuring integrated and whole-of-person approach to care [2], thus enabling people with OA to remain active participants in their lives. We further advocate for participation outcomes to be reported in all OA management program trials.

Finally, we are aware of the requirement for greater promotion and advocacy around the need for OA management programs, including ensuring they deliver evidence-based care in accordance with up-to-date clinical guidelines, and strategies to ensure equity and equality of

delivery in those programs. The question remains how can we bring all the necessary voices to the table ranging from the underserved members of the community to the policy makers and providers of care? This is a priority for the JEI's Steering Committee, and we remain committed to advocating for better OA care internationally.

4.1. Strengths and limitations

The JEI has growing representation from LMICs, and we have new members from Africa, Asia, and Latin America and the Caribbean actively engaging with our work. However, the responders to this survey were still primarily from high-income countries. Greater representation from these regions would have potentially influenced the priorities selected, particularly given the difficulties accessing OA care and the poor awareness of the problem in many LMIC countries [6]. This response rate may be due to the survey being conducted in English, a limitation of undertaking a survey internationally over a web-based program. We have increased the percentage of people from these regions who participated in this survey (18%), and who were from LMICs (14%), as compared to our 2018 survey (4%). We also did not capture the number of participants who were from LMICs but were currently living/working in other regions. The JEI members are continuing to work to address this disparity. We also had a small representation of people with OA (6%) and public health/policy makers (6%) complete this survey. Greater representation from these groups may also have changed the priorities identified (e.g. a greater focus on cost-effectiveness). However, our Working Groups do include patient, public and policy agency representatives, and we are committed to strengthening these alliances.

In conclusion, this survey aimed to set the JEI's research and collaboration agenda for the next 5 years. The results showed strong support for progressing our work in education and training for health professionals delivering OA care, and for delivering shared learnings through workshops, meetings, and other platforms. The results provided new directions for the JEI Steering Committee that aimed to strengthen the delivery of OA management programs in healthcare settings, but with an increasing focus on expanding care into community settings and addressing the social determinants of health that impact OA care. In consultation with the JEI membership, our partner organisations and stakeholders, the JEI Steering Committee will develop a plan to operationalise these priorities. We also intend that the results of this survey can prompt thought, provide direction, and stimulate new ideas for others working in this area of research.

Author contributions

JB, JE, DH, and KM conceived the study. JB, JE, DH, KM designed the study with input from the other authors who represent the JEI Steering Committee. JB and JE collected and analysed the data, and JB, JE, KM and DH drafted the initial manuscript. All authors gave critical review and advice on the study design and interpretation, including the survey questions. All authors contributed to reviewing and revising the manuscript and agreed on the final draft.

Role of the funding source

Declaration of competing interest

DJH is the co-director of the Sydney Musculoskeletal Health Flagship. In addition, DJH is the editor of the osteoarthritis section for UpToDate, co-Editor in Chief of Osteoarthritis and Cartilage and board member of Osteoarthritis Research Society International. DJH provides consulting advice on scientific advisory boards for Pfizer, Lilly, TLCBio, Novartis, Tissuegene, and Biobone. KLB receives royalties from Wolter Kluwers. The remaining authors declare no conflict of interest.

Acknowledgements

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ocarto.2023.100408.

References

[1] B. Gray, J.P. Eyles, S. Grace, D.J. Hunter, N. Osteras, J. Quicke, et al., Best evidence osteoarthritis care: what are the recommendations and what Is needed to improve practice? Clin. Geriatr. Med. 38 (2) (2022) 287–302.

[2] J.L. Bowden, C. Pratt, S. Kobayashi, M. van der Esch, Chapter 10 - the interprofessional team, service delivery, and professional development, in: D.J. Hunter, J.P. Eyles (Eds.), Osteoarthritis Health Professional Training Manual, Academic Press, 2023, pp. 165–194.

[3] K.D. Allen, P.F. Choong, A.M. Davis, M.M. Dowsey, K.S. Dziedzic, C. Emery, et al., Osteoarthritis: models for appropriate care across the disease continuum, Best Pract. Res. Clin. Rheumatol. 30 (3) (2016) 503–535.

[4] K.S. Dziedzic, K.D. Allen, Challenges and controversies of complex interventions in osteoarthritis management: recognizing inappropriate and discordant care, Rheumatology 57 (suppl_4) (2018) iv88–iv98.

[5] J.P. Eyles, D.J. Hunter, K.L. Bennell, K.S. Dziedzic, R.S. Hinman, M. van der Esch, et al., Priorities for the effective implementation of osteoarthritis management programs: an OARSI international consensus exercise, Osteoarthritis Cartilage 27 (9) (2019) 1270–1279.

[6] J.P. Eyles, S. Sharma, R.W. Telles, M. Namane, D.J. Hunter, J.L. Bowden, Implementation of best-evidence osteoarthritis care: perspectives on challenges for, and opportunities from, low and middle-Income countries, Front Rehabil Sci 2 (2021) 826765.

[7] K.D. Allen, K. Huffman, R.J. Cleveland, M. van der Esch, J.H. Abbott, A. Abbott, et al., Evaluating osteoarthritis management programs: outcome domain recommendations from the OARSI joint effort initiative, Osteoarthritis Cartilage 31 (7) (2023) 954–965.

[8] R.S. Hinman, K.D. Allen, K.L. Bennell, F. Berenbaum, N. Betteridge, A.M. Briggs, et al., Development of a core capability framework for qualified health professionals to optimise care for people with osteoarthritis: an OARSI initiative, Osteoarthritis Cartilage 28 (2) (2020) 154–166.

[9] S. Kobayashi, K. Allen, K. Bennell, J.L. Bowden, A.M. Briggs, A. Burgess, et al., A Framework to guide the development of health care professional education and training in best evidence osteoarthritis care, Clin. Geriatr. Med. 38 (2) (2022) 361–384.

[10] D.J. Hunter, J. Eyles (Eds.), Osteoarthritis Health Professional Training Manual, first ed., Academic Press, Geneva, 2023.

[11] J.P. Eyles, J.L. Bowden, A. Abbott, J. Abbott, S. Bierma-Zeinstra, L. Dahlberg, et al., Clinical outcomes of osteoarthritis management programs: a project of the OA Trial Bank and OARSI Joint Effort Initiative using individual participant data, Osteoarthritis Cartilage 31 (2023) S385–S386.

[12] K.A. Miller, L.M. Baier Manwell, D. Rabago, Multimodal care for knee and hip osteoarthritis: a pilot feasibility study of a novel approach to a common problem, Wis. Med. J. 119 (1) (2020) 44–47.

[13] J. Vergés, N. Martínez, Artro 360: new management model to progress in the treatment of osteoarthritis by optimizing the available resources, Osteoarthritis Cartilage 31 (2023) S247.

[14] D.J. Hunter, J.L. Bowden, R.S. Hinman, T. Egerton, A.M. Briggs, S.J. Bunker, et al., Effectiveness of a new service delivery model for management of knee osteoarthritis in primary care: a cluster randomized controlled trial, Arthritis Care Res. 75 (6) (2023) 1320–1332.

[15] R.C. Biscaro, P.G.G. Ochoa, G.P. Ocampos, M.M. Arouca, O.P. de Camargo, M.U. de Rezende, Self-management program (parqve) improves quality of life in severe knee osteoarthritis, Acta Ortop Bras 30 (spe1) (2022) e255939.

[16] L.E. Dahlberg, A. Dell'Isola, L.S. Lohmander, H. Nero, Improving osteoarthritis care by digital means - effects of a digital self-management program after 24- or 48-weeks of treatment, PLoS One 15 (3) (2020) e0229783.

[17] S. Thiengwittayaporn, P. Wattanapreechanon, P. Sakon, A. Peethong, N. Ratisoontorn, N. Charoenphandhu, et al., Development of a mobile application to improve exercise accuracy and quality of life in knee osteoarthritis patients: a randomized controlled trial, Arch Orthop Trauma Surg 143 (2) (2023) 729–738.

[18] S.A. Gohir, F. Eek, A. Kelly, A. Abhishek, A.M. Valdes, Effectiveness of internet-based exercises aimed at treating knee osteoarthritis: the iBEAT-OA randomized clinical trial, JAMA Netw. Open 4 (2) (2021) e210012-e.

[19] S.E. Jones, P.K. Campbell, A.J. Kimp, K. Bennell, N.E. Foster, T. Russell, et al., Evaluation of a novel e-learning program for physiotherapists to manage knee osteoarthritis via telehealth: qualitative study nested in the PEAK (Physiotherapy Exercise and Physical Activity for Knee Osteoarthritis) randomized controlled trial, J. Med. Internet Res. 23 (4) (2021) e25872.

[20] G. Peat, D. Yu, D.T. Gronne, M. Marshall, S.T. Skou, E.M. Roos, Do patients with intersectional disadvantage have poorer outcomes from osteoarthritis management programs? A tapered balancing study of patient outcomes from the good life with osteoarthritis in Denmark program, Arthritis Care Res. 75 (1) (2023) 136–144.

[21] I. Holm, A.H. Pripp, M.A. Risberg, The active with OsteoArthritis (AktivA) physiotherapy implementation model: a patient education, supervised exercise and self-management program for patients with mild to moderate osteoarthritis of the knee or hip joint. A national register study with a two-year follow-up, J. Clin. Med. 9 (10) (2020).

[22] K.L. Bennell, B.J. Lawford, C. Keating, C. Brown, J. Kasza, D. Mackenzie, et al., Comparing video-based, telehealth-delivered exercise and weight loss programs with online education on outcomes of knee osteoarthritis : a randomized trial, Ann. Intern. Med. 175 (2) (2022) 198–209.

[23] A. Dell'Isola, T. Jonsson, J. Ranstam, L.E. Dahlberg, E. Ekvall Hansson, Education, home exercise, and supervised exercise for people with hip and knee osteoarthritis as part of a nationwide implementation program: data from the better management of patients with osteoarthritis registry, Arthritis Care Res. 72 (2) (2020) 201–207.

[24] J.P. Eyles, J.L. Bowden, S. Redman, A. Redman, G. Dawson, S. Newell, et al., Barriers and Enablers to the Implementation of the Australian Osteoarthritis Chronic Care Program (OACCP). Osteoarthritis and Cartilage, Elsevier, 2020, p. S446.

[25] J. Cunningham, A. Mb, E. Cottrell, F. Doyle, K. Dziedzic, A. Finney, et al., Barriers and facilitators to the implementation of osteoarthritis management programmes in primary or community care settings: a systematic review and qualitative framework synthesis protocol, HRB Open Res 4 (102) (2021) 102.

[26] D. Costa, E.B. Cruz, A.M. Rodrigues, D. Goncalves-Bradley, L.A. Gomes, H. Donato, et al., Models of care for patients with knee osteoarthritis in primary healthcare: a scoping review protocol, BMJ Open 11 (6) (2021) e045358.

[27] M.U. Rezende, N. Brito, F. Farias, C. Silva, C. Cernigoy, J.M. Rodrigues da Silva, et al., Improved function and strength in patients with knee osteoarthritis as a result of adding a two-day educational program to usual care. Prospective randomized trial, Osteoarthr Cartil Open 3 (1) (2021) 100137.

[28] L. Martinsen, N. Osteras, T. Moseng, A.T. Tveter, Effect of a mHealth exercise intervention compared with supervised exercise therapy in osteoarthritis management: protocol of the DigiOA trial, BMJ Open 12 (9) (2022) e066248.

[29] A. Tong, A. Synnot, S. Crowe, S. Hill, A. Matus, N. Scholes-Robertson, et al., Reporting guideline for priority setting of health research (REPRISE), BMC Med. Res. Methodol. 19 (1) (2019) 243.

[30] P.A. Harris, R. Taylor, R. Thielke, J. Payne, N. Gonzalez, J.G. Conde, Research electronic data capture (REDCap)–a metadata-driven methodology and workflow process for providing translational research informatics support, J. Biomed. Inf. 42 (2) (2009) 377–381.

[31] A.M. Briggs, C. Huckel Schneider, H. Slater, J.E. Jordan, S. Parambath, J.J. Young, et al., Health systems strengthening to arrest the global disability burden: empirical development of prioritised components for a global strategy for improving musculoskeletal health, BMJ Glob. Health 6 (6) (2021) e006045.

[32] A. Donabedian, The quality of care. How can it be assessed? JAMA 260 (12) (1988) 1743–1748.

[33] J.L. Bowden, L.F. Callahan, J.P. Eyles, J.L. Kent, A.M. Briggs, Realizing health and well-being outcomes for people with osteoarthritis beyond health service delivery, Clin. Geriatr. Med. 38 (2) (2022) 433–448.

[34] D.J. Hunter, L. March, M. Chew, Osteoarthritis in 2020 and beyond: a Lancet commission, Lancet 396 (10264) (2020) 1711–1712.

[35] D. Costa, A. Rodrigues, E. Cruz, H. Canhão, J. Branco, C. Nunes, Healthcare use among people with knee osteoarthritis is driven by social determinants - results from a cross-sectional nationwide study, Osteoarthritis Cartilage 29 (2021) S385–S386.

[36] S.Y. Yang, E.Y.S. Woon, K. Griva, B.Y. Tan, A qualitative study of psychosocial factors in patients with knee osteoarthritis: insights learned from an asian population, Clin. Orthop. Relat. Res. 481 (5) (2023) 874–884.

[37] A.M. Briggs, E. Houlding, R.S. Hinman, L.A. Desmond, K.L. Bennell, B. Darlow, et al., Health professionals and students encounter multi-level barriers to implementing high-value osteoarthritis care: a multi-national study, Osteoarthritis Cartilage 27 (5) (2019) 788–804.

[38] L. Davies, B. Lawford, K.L. Bennell, T. Russell, R.S. Hinman, Telehealth education and training in entry-to-practice physiotherapy programs in Australian universities: a qualitative study with university educators, Muscoskel, Care 21 (2) (2023) 491–501.

[39] J. Chevan, M. Barrett, K. Nowakowski, K. Pappas, H. Murphy, E. Erck, et al., Responding to stakeholder needs to engage rehabilitation professionals in the delivery of evidence-based health programming for adults with osteoarthritis, Front Rehabil Sci 3 (2022) 907477.

[40] L.F. Callahan, K.R. Ambrose, A.L. Albright, M. Altpeter, Y.M. Golightly, K.F. Huffman, et al., Public health interventions for osteoarthritis - updates on the osteoarthritis action alliance's efforts to address the 2010 OA public health agenda recommendations, Clin. Exp. Rheumatol. 37 (Suppl 120(5)) (2019) 31–39.

[41] B.J. Lawford, C. Delany, K.L. Bennell, C. Bills, J. Gale, R.S. Hinman, Training physical therapists in person-centered practice for people with osteoarthritis: a qualitative case study, Arthritis Care Res. 70 (4) (2018) 558–570.

[42] K.D. Allen, S.M. Bierma-Zeinstra, N.E. Foster, Y.M. Golightly, G. Hawker, OARSI Clinical Trials Recommendations: design and conduct of implementation trials of interventions for osteoarthritis, Osteoarthritis Cartilage 23 (5) (2015) 826–838.

[43] G.F. Moore, S. Audrey, M. Barker, L. Bond, C. Bonell, W. Hardeman, et al., Process evaluation of complex interventions: medical Research Council guidance, BMJ 350 (2015) h1258.

[44] C. French, H. Pinnock, G. Forbes, I. Skene, S.J.C. Taylor, Process evaluation within pragmatic randomised controlled trials: what is it, why is it done, and can we find it?-a systematic review, Trials 21 (1) (2020) 916.

[45] B.Y. Tan, T. Thach, Y.L. Munro, S.T. Skou, J. Thumboo, J. Car, et al., Complex lifestyle and psychological intervention in knee osteoarthritis: scoping review of randomized controlled trials, Int J Environ Res Public Health 18 (23) (2021).

[46] N. Osteras, T. Moseng, L. van Bodegom-Vos, K. Dziedzic, I. Mdala, B. Natvig, et al., Implementing a structured model for osteoarthritis care in primary healthcare: a stepped-wedge cluster-randomised trial, PLoS Med. 16 (10) (2019) e1002949.

[47] T. Moseng, H. Dagfinrud, N. Osteras, Implementing international osteoarthritis guidelines in primary care: uptake and fidelity among health professionals and patients, Osteoarthritis Cartilage 27 (8) (2019) 1138–1147.

[48] E.L. Healey, E.K. Afolabi, M. Lewis, J.J. Edwards, K.P. Jordan, A. Finney, et al., Uptake of the NICE osteoarthritis guidelines in primary care: a survey of older adults with joint pain, BMC Muscoskel. Disord. 19 (1) (2018) 295.

[49] A.P. Verhagen, M. Ferreira, E.A.E. Reijnveld-van de Vendel, C.H. Teirlinck, J. Runhaar, M. van Middelkoop, et al., Do we need another trial on exercise in patients with knee osteoarthritis?: No new trials on exercise in knee OA, Osteoarthritis Cartilage 27 (9) (2019) 1266–1269.

[50] C.E. Ashton-James, S.R. Anderson, S.C. Mackey, B.D. Darnall, Beyond pain, distress, and disability: the importance of social outcomes in pain management research and practice, Pain 163 (3) (2022) e426–e431.

[51] S. McKevitt, E. Healey, C. Jinks, T. Rathod-Mistry, J. Quicke, The association between comorbidity and physical activity levels in people with osteoarthritis: secondary analysis from two randomised controlled trials, Osteoarthr Cartil Open 2 (2) (2020) 100057.

[52] J.G. Quicke, L.R. Swaithes, L.H. Campbell, J.L. Bowden, J.P. Eyles, K.D. Allen, et al., The OARSI "Joint Effort Initiative" repository of online osteoarthritis management programmes: an implementation rapid response during covid-19, Osteoarthritis Cartilage 29 (2021) S87–S89.

[53] K.L. Bennell, C. Keating, B.J. Lawford, A.J. Kimp, T. Egerton, C. Brown, et al., Better Knee, Better Me: effectiveness of two scalable health care interventions supporting self-management for knee osteoarthritis - protocol for a randomized controlled trial, BMC Musculoskelet Disord 21 (1) (2020) 160.