Musculoskeletal Care

WILEY

RESEARCH ARTICLE OPEN ACCESS

Geographical Differences in the Perspective of Osteoarthritis Care Management: A Cross-Sectional Study in Italy, Sweden and Russia

Simone Battista[1,2,3] | Filippo Recenti[2,3] | Benedetto Giardulli[2] | Marco Testa[2] | Polina Pchelnikova[4] | Mwidimi Ndosi[5] | Andrea Dell'Isola[3]

[1]School of Health and Society, Centre for Human Movement and Rehabilitation, University of Salford, Salford, UK | [2]Department of Neuroscience, Rehabilitation, Ophthalmology, Genetics, Maternal and Child Health, University of Genova, Genoa, Italy | [3]Department of Clinical Sciences, Clinical Epidemiology Unit, Orthopaedics, Lund University, Lund, Sweden | [4]Patient Research Partner | [5]School of Health and Social Wellbeing, University of the West of England, Bristol, UK

Correspondence: Simone Battista (s.battista@salford.ac.uk)

Received: 9 August 2024 | **Revised:** 13 August 2024 | **Accepted:** 16 August 2024

Funding: This work was funded by the European Alliance of Associations for Rheumatology (EULAR) Health Professionals Research Grant 2020 (HPR050).

Keywords: conservative treatment | consumer behaviour | culture | disease management | osteoarthritis | rehabilitation | rheumatic diseases

ABSTRACT

Background: This study aimed to explore the awareness, experiences, and beliefs of individuals with osteoarthritis (OA) regarding their healthcare management, along with assessing their overall satisfaction levels.

Methods: A cross-sectional online survey was conducted in Italy, Sweden, and Russia, rigorously developed based on OA international guidelines in collaboration with healthcare professionals and individuals with OA. Participants over 40 years of age with self-reported hip and/or knee OA were eligible. The analytical framework included descriptive analysis (assessment of awareness levels for 'recommended', 'optional', and 'not recommended' treatments), analysis of suggested treatments and taken treatments, exploration of beliefs, barriers and satisfaction analysis (0–100 scale).

Results: A total of 401 participants (mean age: 59.7, 78.3% female, 28% Italian, 49% Swedish, 23% Russian) contributed to the study. In Sweden, 57%–72% accurately identified recommended treatments, while in Russia, the range was 34%–91%, and in Italy, it was 35%–73%. The predominant suggested and taken treatments were oral anti-inflammatory drugs in Italy (87/81%) and Russia (97/97%) and specific exercise in Sweden (84/79%). Notably, only Sweden reached a consensus on the effectiveness of exercise for everyone, while Russia and Italy insisted on radiographic findings as a prerequisite for exercise. Mean satisfaction levels were 59.7 (Italy), 47.4 (Sweden), and 35.2 (Russia).

Conclusions: This study uncovered variations in awareness, treatment preferences, and beliefs among the three countries, underscoring the necessity for tailored education on OA management that accounts for regional differences across Europe.

1 | Introduction

In the Rheumatic and Musculoskeletal Diseases (RMD) field, a limited proportion of individuals with these diseases receive adequate healthcare in Europe (Woolf et al. 2004). Among the different RMD, osteoarthritis (OA) stands out as a leading cause of disability worldwide, exerting a significant impact on individuals' well-being and productivity as well as on healthcare systems (Kingsbury et al. 2014; Safiri et al. 2020). Given the absence of disease-modifying interventions for OA,

recommended treatments primarily target symptom management and disability reduction through exercise, education and dietary modifications (Bannuru et al. 2019; Kolasinski et al. 2020; Moseng et al. 2024; National Clinical Guidelines Centre 2014). However, OA remains under-diagnosed and under-treated (Basedow and Esterman 2015; Runciman et al. 2012; Theis, Brady, and Sacks 2018). Individuals with OA do not receive sufficient guidance on its management, leading to difficulties in effectively engaging with first-line interventions if they are unaware of their importance. Yet individuals play a crucial role in determining their health outcomes (Chou et al. 2018; Jones et al. 2021) and they must be aware of first-line interventions (Battista et al. 2023a). Nevertheless, even if aware, individual willingness, beliefs, and perceived barriers can influence engagement and adherence (Battista, Dell'Isola et al. 2021; Battista et al. 2022; Dobson et al. 2016; Egerton et al. 2017; Kanavaki et al. 2017).

Recently, the European Alliance of Associations for Rheumatology (EULAR) published its updated recommendations for the non-pharmacological core management of people with hip and knee OA, stressing the importance of increasing the population's awareness of the role and benefits of OA evidence-based management in its educational agenda (Moseng et al. 2024). Moreover, people with OA should be aware of the limited benefits (and potential harms) of non-recommended treatments to prevent the wasting of resources and time that could be allocated to evidence-based treatments. Hence, it is necessary to understand people's levels of awareness of recommended and not recommended interventions for OA management across Europe to have an overall picture of the present situation before starting future educational interventions.

Consequently, we conducted a cross-sectional study in three European countries (Italy, Sweden, and Russia) to assess (i) the individuals' awareness of appropriate OA management practices; (ii) the quality of received healthcare, encompassing an examination of the treatments they were recommended and those they followed; (iii) beliefs surrounding OA management; (iv) obstacles encountered in managing OA; and the (v) overall level of satisfaction with OA healthcare. We chose these three countries as they showed a steady increase in OA prevalence (Kabalyk 2018; Kiadaliri et al. 2018; Osservatorio Nazionale sulla Salute nelle Regioni Italiane 2022) and because they are proxies of distinct European regions, namely, the Mediterranean area (Italy), Nordic Region (Sweden) and Eastern Europe (Russia).

2 | Methods

2.1 | Study Design

A cross-sectional, online survey-based study was developed and disseminated in Italy, Sweden, and Russia. It was designed according to the 'International Handbook of Survey Methodology' (de Leeuw, Hox, and Dillman 2008) and reported following the 'Strengthening the Reporting of Observational Studies in Epidemiology' (STROBE) recommendations (von Elm et al. 2007). In Italy, ethical approval was obtained from the Ethics Committee for University Research (Code: CERA2020.07), University of Genova (approval date: 15/06/2020). No Ethics Committee approvals were necessary in Sweden and Russia for this kind of study (web-based survey anonymised at the source).

2.2 | Survey Instrument Development

The survey instrument was developed based on the ACR (American College of Rheumatology), EULAR (European League Against Rheumatism), NICE (National Institute for Health and Care Excellence) and OARSI (Osteoarthritis Research Society International) guidelines (Bannuru et al. 2019; Fernandes et al. 2013; Kolasinski et al. 2020; National Clinical Guidelines Centre 2014) and the results of a qualitative study that we performed before this survey (Battista et al. 2022). The first draft of the survey instrument was created in Italian by a pool of healthcare professionals (three physiotherapists and one psychologist) and a patient-research partner with OA. It was then translated into English by an Italian English-native-speaking level translator, assessed by an English native-speaker nurse and then shared with a panel of two physiotherapists, one psychologist and one patient-research partner from Italy, one physiotherapist from Sweden, one patient-research partner from Russia, and one nurse from the UK. The English version was modified until an agreement was reached between the different partners. The final version in English can be found in Supporting Information S1. Hence, the English survey was back-translated into the three target languages (Italian, Sweden and Russia) following phase 1 (Cross-cultural and linguistic adaptation) of the international guidelines for PROM development (Beaton et al. 2000).

The online version of the survey instrument was delivered through 'Microsoft 365 Forms' in Italy, Sweden and Russia from December 2021 until June 2022. Microsoft 365 is a secure web application to build and manage online surveys and databases, respecting the European General Data Protection Regulations. The survey instrument included a brief cover letter and informed consent outlining the aim of the study. The cover letter emphasised that participation in the survey was voluntary and that anonymity and confidentiality were guaranteed. No missing data are allowed by Microsoft 365 Forms as participants cannot conclude the survey if they do not answer all the mandatory questions.

The survey instrument was divided into five sections:

Section 1—Descriptive analysis: in this section, individuals provided their demographic and clinical data (e.g., gender they identified with, age, country where they sought treatment, if they were living alone, educational attainment, profession, height, weight, level of physical activity, most affected joint(s) by OA, years with OA, comorbidities, if they were on a waiting list for total joint replacement, pain intensity (0–100), level of disability (0–100) and the healthcare professionals they consulted.

Section 2—Level of Knowledge: in this section, individuals indicated how they considered 22 treatments for the management of their pathology (e.g., weight advice, physical activity, drugs, supplements, etc.) by selecting among these three possible answers (A) recommended (Strongly recommended treatment); (B) optional (partially recommended treatment); (C) not recommended (treatment not recommended or to avoid). The classification of the treatments was based on a synthesis of the EULAR, OARSI, NICE and ACR guidelines (Bannuru et al. 2019; Fernandes et al. 2013; Kolasinski et al. 2020; National Clinical Guidelines Centre 2014). Supporting Information S2 reports the treatments' classification.

Section 3—Treatments performed and suggested: in this section, participants indicated if they were ever referred to their healthcare professionals (e.g., physicians, physiotherapists, nurses, etc.) to perform the abovementioned 22 treatments and if they had ever really taken them (answer: yes/no).

Section 4—Expectations, beliefs and perceived barriers to OA management: Participants indicated to what extent they agreed or disagreed with several statements based on the results of the previously mentioned qualitative study (Battista et al. 2022). The statements explore patiens' perceptions about expectations, beliefs and barriers towards implementing non-surgical treatments. The level of agreement was based on a 5-point Likert scale (0: strongly disagree; 1: partially disagree; 2: neither agree or disagree; 3: partially agree; 4: strongly agree).

Section 5—Level of satisfaction: In this section, individuals indicated their overall level of satisfaction with the treatment received and the received information about OA management on a scale from 0 to 100.

2.3 | Participants

People over >40 years old (Zhang et al. 2010) with a self-reported diagnosis of hip and/or knee OA were eligible for this study if they received healthcare in their own country. To establish this, the survey instrument included two preliminary questions asking the respondents whether they had received a diagnosis of hip and/or knee OA and if they had received healthcare in their own country. Participants who answered 'No' to one of these questions were shown a 'Thank-You' page and were not allowed to continue with the survey.

Different dissemination strategies were adopted in the different countries to reach the participants. In Italy, the survey was disseminated through patients' association categories (ANMAR: Italian Association of People with RMD), social media outlets, word-of-mouth among healthcare professionals, and Livio Sciutto Foundation (Savona, Italy). This Italian foundation is focussed on research and clinical application of orthopaedic surgery. Specifically, they sent an invitation to people with OA in their database who had pre-consented to be contacted for any scientific projects. This email contained the aims of the study and a link to the survey.

In Sweden, the survey was disseminated through social media outlets and the Artrosportalen site (www.artrosportalen.lu.se). This site is an initiative by researchers at Lund University to disseminate accurate and up-to-date information about OA, its treatments and the latest research findings directly from researchers to the general public.

In Russia, the survey was integrated into the Moscow branch of the Russian Nadezhda newsletter (https://vspru.ru/en/members/nadezhda). This organisation is one of the most active patient organisations in the country. It is an umbrella organisation with 55 regional branches and five thousand members. It deals with government officials at both regional and federal levels, provides psychological and legal assistance for patients, and organises educational conferences for them.

2.4 | Analysis

2.4.1 | Section 1—Sample's Characteristics

We first conducted a descriptive analysis of the data to summarise the demographic and clinical characteristics of the sample. Continuous variables are reported as mean (standard deviation, SD) and categorical variables as absolute and percentage frequencies.

2.4.2 | Section 2—Patients' Level of Awareness

The percentages of 'recommended', 'optional', or 'not recommended' were calculated.

2.4.3 | Section 3—Treatments Suggested and Taken

The different percentages of 'Suggested'/'Not Suggested', and 'Taken'/'Not Taken' treatments among the different countries were reported.

2.4.4 | Section 4—Expectations, Beliefs and Perceived Barriers Towards OA Management

Four different bar charts indicating the levels of agreement with the different statements in the different countries were created. In line with Delphi studies, 70% of consensus was considered the threshold of agreement (Caffini et al. 2022; Cutolo, Battista, and Testa 2021).

2.4.5 | Section 5—Level of Satisfaction

The mean (SD) levels of satisfaction across countries were calculated.

2.5 | Patient and Public Involvement

Supporting Information S3 shows the patient and public involvement in the present study following the Guidance for Reporting Involvement of Patients and the Public (GRIPP2)

TABLE 1 | Demographic data.

	Italy (*N* = 111)	Sweden (*N* = 193)	Russia (*N* = 97)	Overall (*N* = 401)
Age (Mean (SD))	60.8 (9.85)	61.6 (8.91)	54.6 (9.59)	59.7 (9.76)
Age by groups (*N*, %)				
Between 40 and 49 years old	11 (9.9%)	20 (10.4%)	34 (35.1%)	65 (16.2%)
Between 50 and 59 years old	43 (38.7%)	62 (32.1%)	41 (42.3%)	146 (36.4%)
Between 60 and 69 years old	37 (33.3%)	77 (39.9%)	13 (13.4%)	127 (31.7%)
Between 70 and 79 years old	14 (12.6%)	31 (16.1%)	6 (6.2%)	51 (12.7%)
More than 80 years old	6 (5.4%)	3 (1.6%)	3 (3.1%)	12 (3.0%)
Gender (*N*, %)				
Male	52 (46.8%)	29 (15.0%)	4 (4.1%)	85 (21.2%)
Female	58 (52.3%)	163 (84.5%)	93 (95.9%)	314 (78.3%)
Prefer not to answer	1 (0.9%)	1 (0.5%)	0 (0%)	2 (0.5%)
Living alone (*N*, %)				
No	82 (73.9%)	139 (72.0%)	79 (81.4%)	300 (74.8%)
Yes	29 (26.1%)	54 (28.0%)	18 (18.6%)	101 (25.2%)
Profession (*N*, %)				
Unemployed	4 (3.6%)	5 (2.6%)	6 (6.2%)	15 (3.7%)
Retired	41 (36.9%)	80 (41.5%)	41 (42.3%)	162 (40.4%)
Sedentary	32 (28.8%)	45 (23.3%)	38 (39.2%)	115 (28.7%)
Dynamic	26 (23.4%)	50 (25.9%)	10 (10.3%)	86 (21.4%)
Heavy	8 (7.2%)	13 (6.7%)	2 (2.1%)	23 (5.7%)
Education (*N*, %)				
Primary education	27 (24.3%)	11 (5.7%)	5 (5.2%)	43 (10.7%)
Secondary education	49 (44.1%)	63 (32.6%)	24 (24.7%)	136 (33.9%)
Upper secondary education	35 (31.5%)	119 (61.7%)	68 (70.1%)	222 (55.4%)
Weight (Mean (SD))	78.6 (16.7)	79.2 (17.4)	75.1 (17.5)	78.0 (17.3)
Height (Mean (SD))	1.70 (0.10)	1.69 (0.10)	1.64 (0.10)	1.68 (0.10)
BMI (Mean (SD))	27.0 (4.97)	27.6 (5.93)	27.9 (5.94)	27.5 (5.68)
BMI by categories (*N*, %)				
Underweight (BMI < 18.5)	3 (2.7%)	4 (2.1%)	1 (1.0%)	8 (2.0%)
Normal range (BMI 18.5–24.9)	40 (36.0%)	68 (35.2%)	32 (33.0%)	140 (34.9%)
Overweight (BMI 25–29.9)	42 (37.8%)	70 (36.3%)	35 (36.1%)	147 (36.7%)
Obese (BMI ≥ 30)	26 (23.4%)	51 (26.4%)	29 (29.9%)	106 (26.4%)
Comorbidities (*N*, %)				
No	47 (42.3%)	72 (37.3%)	8 (8.2%)	127 (31.7%)
Yes	64 (57.7%)	121 (62.7%)	89 (91.8%)	274 (68.3%)
Type of comorbidities (*N*, %)[§]				
High blood pressure	32 (28.8%)	69 (35.8%)	38 (39.2%)	139 (34.7%)
Cardiovascular diseases	13 (11.7%)	16 (8.3%)	25 (25.8%)	54 (13.5%)
Diabetes	11 (9.9%)	10 (5.2%)	4 (4.1%)	25 (6.2%)
Pulmonary disease	3 (2.7%)	6 (3.1%)	10 (10.3%)	19 (4.7%)
Psychiatric disorders	7 (6.3%)	20 (10.4%)	4 (4.1%)	31 (7.7%)
Other	25 (22.5%)	30 (15.5%)	77 (79.4%)	132 (32.9%)

(Continues)

TABLE 1 | (Continued)

	Italy (*N* = 111)	Sweden (*N* = 193)	Russia (*N* = 97)	Overall (*N* = 401)
Practicing sport(s) (*N*, %)				
No	68 (61.3%)	47 (24.4%)	72 (74.2%)	187 (46.6%)
Yes	43 (38.7%)	146 (75.6%)	25 (25.8%)	214 (53.4%)
How many times practicing sport(s) (*N*, %)				
1–2	24 (21.6%)	47 (24.4%)	11 (11.3%)	82 (20.4%)
3–5	17 (15.3%)	63 (32.6%)	8 (8.2%)	88 (21.9%)
6–7	2 (1.8%)	26 (13.5%)	5 (5.2%)	33 (8.2%)
>7	0 (0%)	10 (5.2%)	1 (1.0%)	11 (2.7%)
Missing (no sport)*	68 (61.3%)	47 (24.4%)	72 (74.2%)	121 (46.7%)
Most affected joint (*N*, %)				
Hip	38 (34.2%)	50 (25.9%)	21 (21.6%)	109 (27.2%)
Knee	48 (43.2%)	96 (49.7%)	31 (32.0%)	175 (43.6%)
Hip and knee	25 (22.5%)	47 (24.4%)	45 (46.4%)	117 (29.2%)
Years of osteoarthritis (Mean (SD))	7.27 (5.06)	9.25 (8.93)	7.69 (6.30)	8.33 (7.46)
Years of osteoarthritis by groups (*N*, %)				
Between 1 and 4 years	41 (36.9%)	66 (34.2%)	31 (32.0%)	138 (34.4%)
Between 5 and 9 years	34 (30.6%)	49 (25.4%)	38 (39.2%)	121 (30.2%)
Between 10 and 19 years old	29 (26.1%)	56 (29.0%)	19 (19.6%)	104 (25.9%)
More than 20 years	7 (6.3%)	22 (11.4%)	9 (9.3%)	38 (9.5%)
Pain Intensity (0–100) (Mean (SD))	62.6 (21.0)	57.9 (24.3)	61.0 (18.9)	60.0 (22.2)
Disability Intensity (0–100) (Mean (SD))	63.5 (23.3)	67.4 (22.2)	61.9 (23.9)	65.0 (23.0)
In a waiting list for TJR (*N*, %)				
No	73 (65.8%)	174 (90.2%)	82 (84.5%)	329 (82.0%)
Yes	38 (34.2%)	19 (9.8%)	15 (15.5%)	72 (18.0%)
Physiotherapist consulted (*N*, %)				
No	64 (57.7%)	66 (34.2%)	74 (76.3%)	204 (50.9%)
Yes	47 (42.3%)	127 (65.8%)	23 (23.7%)	197 (49.1%)
Orthopaedic consulted (*N*, %)				
No	13 (11.7%)	120 (62.2%)	77 (79.4%)	210 (52.4%)
Yes	98 (88.3%)	73 (37.8%)	20 (20.6%)	191 (47.6%)
Rheumatologist consulted (*N*, %)				
No	104 (93.7%)	192 (99.5%)	55 (56.7%)	351 (87.5%)
Yes	7 (6.3%)	1 (0.5%)	42 (43.3%)	50 (12.5%)
Sports scientists consulted (*N*, %)				
No	106 (95.5%)	188 (97.4%)	86 (88.7%)	380 (94.8%)
Yes	5 (4.5%)	5 (2.6%)	11 (11.3%)	21 (5.2%)
Chiropractor consulted (*N*, %)				
No	103 (92.8%)	177 (91.7%)	94 (96.9%)	374 (93.3%)
Yes	8 (7.2%)	16 (8.3%)	3 (3.1%)	27 (6.7%)
Osteopath consulted (*N*, %)				
No	92 (82.9%)	186 (96.4%)	91 (93.8%)	369 (92.0%)
Yes	19 (17.1%)	7 (3.6%)	6 (6.2%)	32 (8.0%)

Abbreviations: *, answered 'no' to the question: 'Practising Sport(s)'; §, the percentages go beyond 100% as people could have multiple comorbidities; *N*, number; SD, standard deviation; TJR, total joint replacement.

reporting checklist (Staniszewska et al. 2017). One patient representative from the Russian patient association identified the research need, designed and conducted the study, and recruited participants. Another patient representative from the Italian Patient Association of people with RMD provided further insight into the survey creation and helped to recruit the participants.

3 | Results

3.1 | Section 1—Sample's Characteristics

A total of 401 participants met the eligibility criteria and were surveyed, with a mean age of 59.7. Regarding gender, 78.3% identified as female, and 21.2% as male. The national breakdown showed 28% from Italy, 49% from Sweden, and 23% from Russia. The most affected joints were the knee (43.6%), hip (27.2%), and both hip and knee (29.2%). The mean duration of OA was 8.33 years (SD: 7.46). Pain intensity (0–100) was 60.0 (SD: 22.2), and disability intensity (0–100) was 65.0 (SD: 23.0). Overall, the 68.3% had one comorbidity at least. High blood pressure was the most frequent one (35%), followed by cardiovascular diseases (14%), mental health issues such as major depression and generalised anxiety disorders (8%), diabetes (6%) and pulmonary disease (5%). The 33% of participants reported to have other non-well specified comorbidities. Table 1 reports the detailed descriptive characteristics of the sample.

3.2 | Section 2—Patients' Level of Awareness

Figure 1 presents the percentages of how participants considered the recommended treatments, namely, recommended, optional, or not recommended. In Sweden, participants showed recognition rates ranging from 57% for education programs to 72% for weight loss. In Russia, recognition rates ranged from 34% (balance training) to 91% (maintaining a healthy weight), while in Italy, it varied between 35% (balance training) and 73% (weight loss). Shifting to Figure 2, depicting percentages for optional treatments, recognition rates differed. In Sweden, correct identification ranged from 9% (antidepressant drugs) to 47% (oral anti-inflammatory drugs). In Russia, it ranged from 15% (opioids) to 38% (topical anti-inflammatory drugs), and in Italy, from 11% (antidepressant drugs) to 46% (topical anti-inflammatory drugs). Figure 3 focuses on non-recommended treatments, with correct identification rates spanning from 8% (Paracetamol) to 26% (homoeopathy) in Sweden, 8% (growth factor injections) to 25% (natural therapies) in Russia, and 8% (hyaluronic acid injections) to 34% (homoeopathic) in Italy.

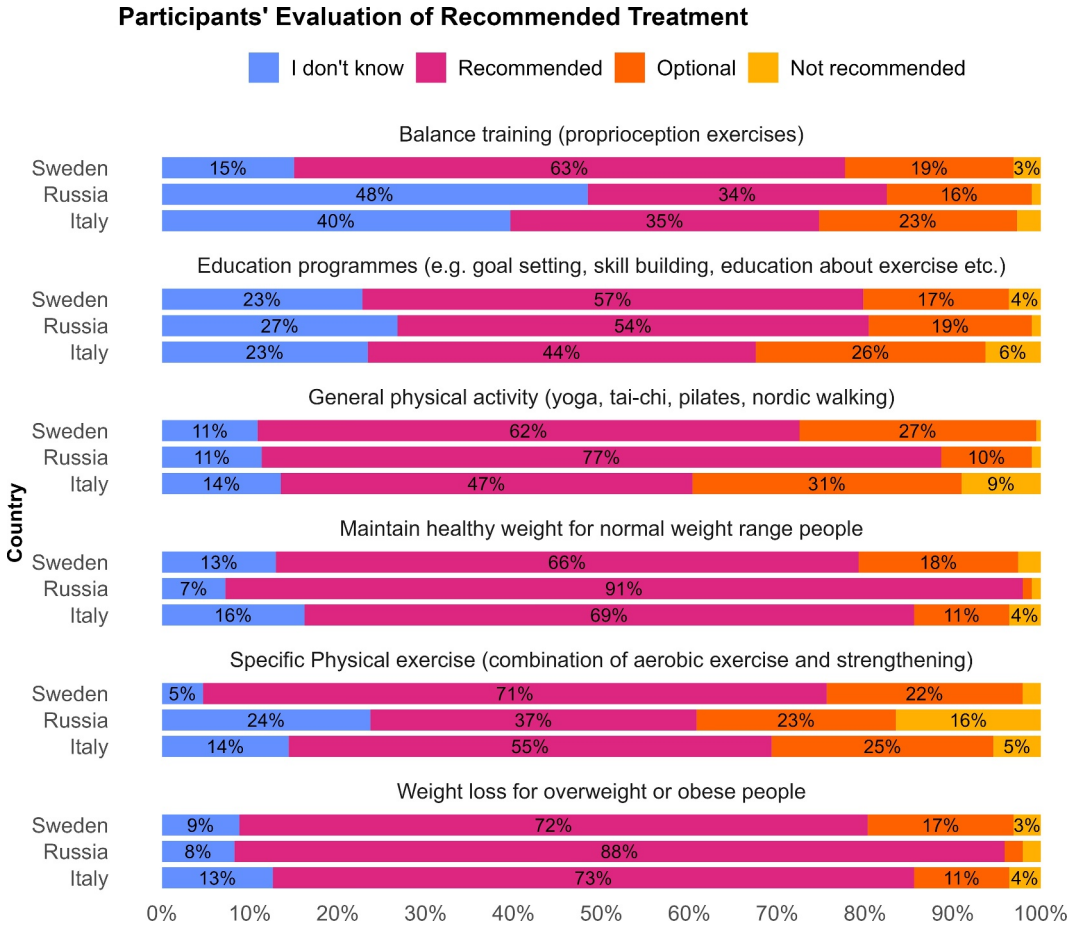

FIGURE 1 | Participants' evaluation of the recommended treatments. The percentages for categories with less than 3% of answers are not reported.

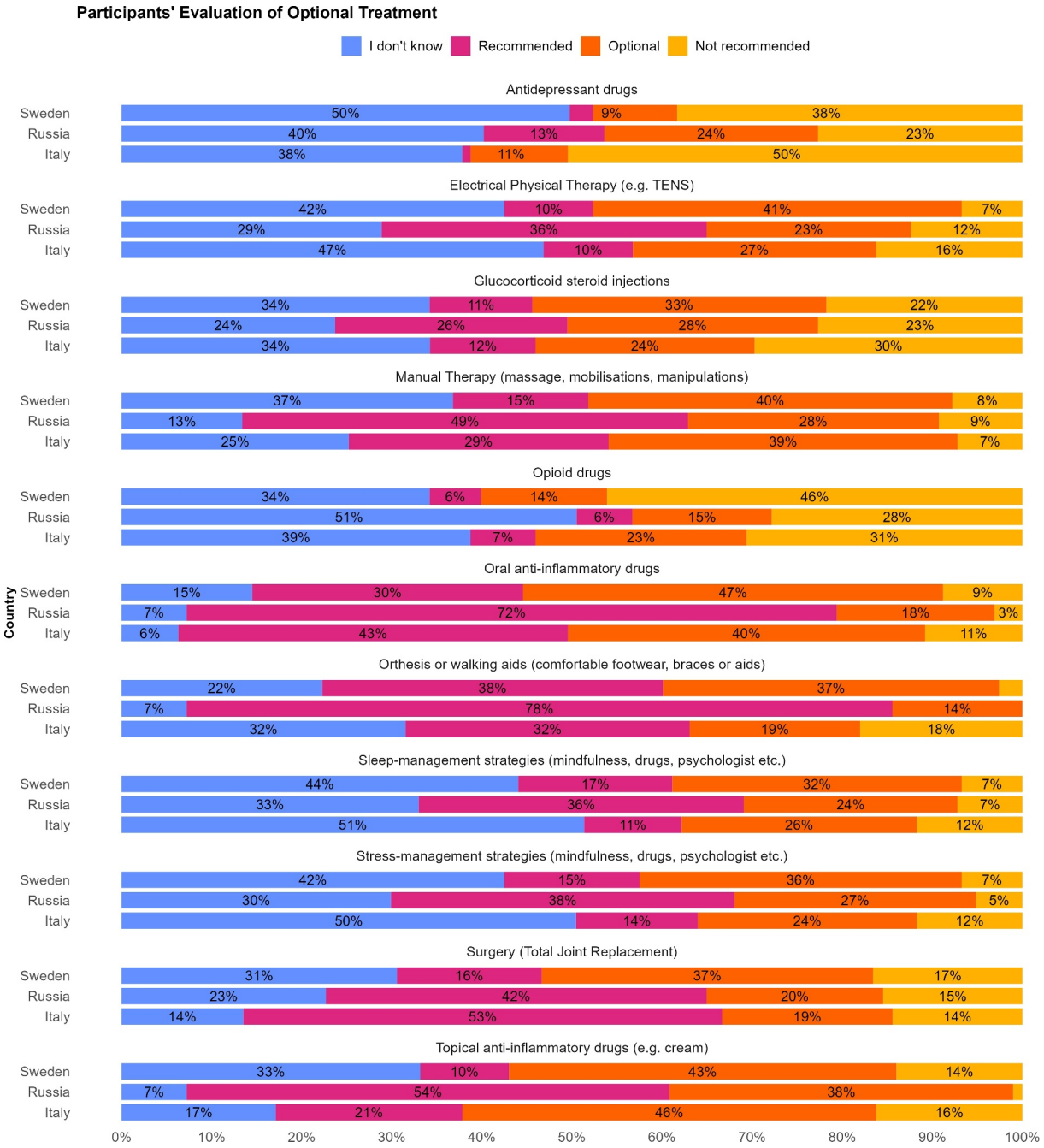

FIGURE 2 | Participants' evaluation of the optional treatments. The percentages for categories with less than 3% of answers are not reported.

Respondents frequently selected 'I don't know' for optional and non-recommended treatments, reaching up to 50%–74%. Supporting Information S4 reports the breakdown of the frequencies and percentages of the answers in Figures 1–3.

3.3 | Section 3—Treatments Suggested and Taken

Table 2 reports the percentages of suggested and taken treatments in the whole sample in the different countries. The most suggested/taken treatments were oral anti-inflammatory drugs in Italy (87/81%) and Russia (97/97%) and specific physical exercise in Sweden (84/79%). The last suggested/taken treatments were antidepressants in Italy (7/5%), homoeopathic therapies and growth factor injections and/or platelet-rich plasma (1/1%) in Sweden, and growth factor injections and/or platelet-rich plasma (4/5%) in Russia.

3.4 | Section 4—Expectations, Beliefs, and Perceived Barriers Towards OA Management

Figure 4 reports the percentages of agreement/disagreement with statements regarding OA healthcare. A consensus (>70% agreement) was found in perceiving OA treatments as uncertain in Russia and seeking online information for OA healthcare in

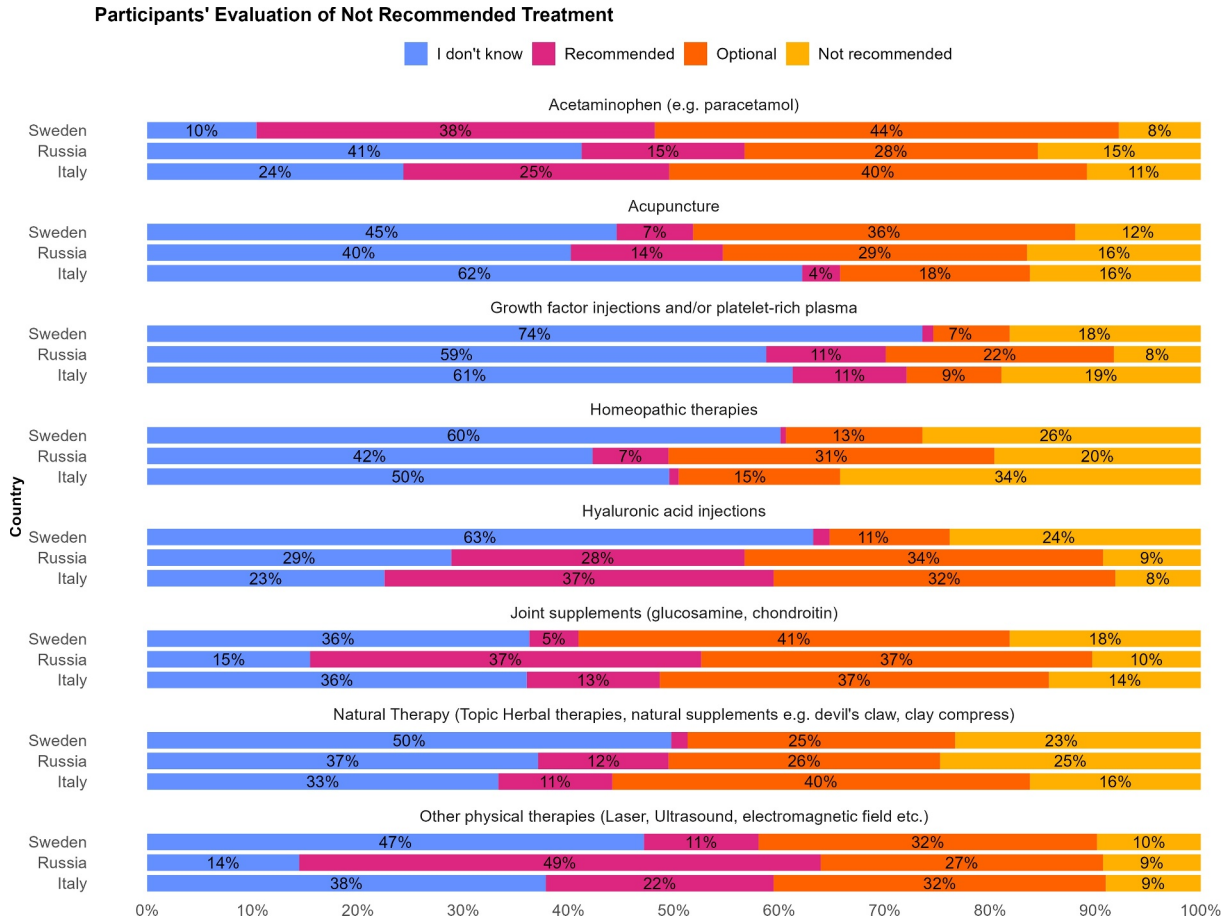

FIGURE 3 | Participants' evaluation of the non-recommended treatments. The percentages for categories with less than 3% of answers are not reported.

Russia and Sweden. Supporting Information S5 reports the breakdown of percentages and frequencies based on the 5-point Likert scale. Supporting Information S6 reports the figure with the participants' levels of agreement on statements regarding non-surgical treatments. Consensus on the effectiveness of exercise for everyone was only found in Sweden. Russian and Italian participants believed that radiographic findings were necessary before engaging in physical exercise and that weight loss is important for reducing body inflammation in OA. Moreover, in Russia, the participants reported that low-impact physical exercise should be preferred to high-impact exercise. In Italy, a consensus was not achieved, but the agreement was up to 69% (close to the 70% agreement). Moreover, Russian participants reported that rest from exercise is needed in cases of severe OA. The agreement was also found in all three countries about the importance of weight loss in reducing the load on the joint in OA and the usefulness of physical exercise in preventing comorbidities. Supporting Information S7 reports the breakdown of percentages and frequencies based on the 5-point Likert scale. Supporting Information S8 reports the figure of the percentages of agreement with statements on the perceived barriers to exercise and diet adherence. As per the barriers to exercise, the cost and lack of coverage by the public insurance/healthcare system for exercise were perceived as barriers to exercise adherence in Russia. No consensus was found regarding diet barriers among countries. Supporting Information S9 reports the breakdown of percentages and frequencies based on the 5-point Likert scale.

3.5 | Section 5—Level of Satisfaction

Mean (SD) satisfaction scores (0–100) related to the treatment received for OA were 47.8 (27.6) overall and 59.7 (25.0), 47.4 (28.0), and 35.2 (23.9) in Italy, Sweden, and Russia, respectively. Mean (SD) satisfaction scores (0–100) related to the information received from healthcare professionals for the treatment of OA were 48.9 (29.3) overall and 62.9 (25.6), 47.2 (28.9), and 36.2 (27.8) in Italy, Sweden, and Russia, respectively.

4 | Discussion

This cross-sectional web-based survey examined geographical differences in OA healthcare management in Italy, Sweden and Russia, highlighting differences and similarities between the three countries. Survey participants generally demonstrated greater awareness of the recommended treatments than of optional and not-recommended treatments. However, when it came to the actual management, differences across countries were found.

Compared with Italy and Russia, Sweden prioritised exercise and education in OA management. Swedish participants strongly endorsed specific aerobic exercise and strengthening. In contrast, Russian respondents preferred general activities like

TABLE 2 | Participants' percentages and frequencies of suggested and taken treatments.

	Italy (*N* = 111)		Sweden (*N* = 193)		Russia (*N* = 97)		Overall (*N* = 401)	
	Suggested	**Taken**	**Suggested**	**Taken**	**Suggested**	**Taken**	**Suggested**	**Taken**
Surgery (total joint replacement)								
No, *N* (%)	42 (37.8%)	80 (72.1%)	137 (71.0%)	173 (89.6%)	67 (69.1%)	83 (85.6%)	246 (61.3%)	336 (83.8%)
Yes, *N* (%)	69 (62.2%)	31 (27.9%)	56 (29.0%)	20 (10.4%)	30 (30.9%)	14 (14.4%)	155 (38.7%)	65 (16.2%)
Electrical physical therapy (e.g., TENS)								
No, *N* (%)	80 (72.1%)	85 (76.6%)	156 (80.8%)	156 (80.8%)	57 (58.8%)	62 (63.9%)	293 (73.1%)	303 (75.6%)
Yes, *N* (%)	31 (27.9%)	26 (23.4%)	37 (19.2%)	37 (19.2%)	40 (41.2%)	35 (36.1%)	108 (26.9%)	98 (24.4%)
Other physical therapies (laser, ultrasound, electromagnetic field etc.)								
No, *N* (%)	58 (52.3%)	63 (56.8%)	173 (89.6%)	173 (89.6%)	32 (33.0%)	39 (40.2%)	263 (65.6%)	275 (68.6%)
Yes, *N* (%)	53 (47.7%)	48 (43.2%)	20 (10.4%)	20 (10.4%)	65 (67.0%)	58 (59.8%)	138 (34.4%)	126 (31.4%)
Acupuncture								
No, *N* (%)	97 (87.4%)	101 (91.0%)	163 (84.5%)	158 (81.9%)	89 (91.8%)	89 (91.8%)	349 (87.0%)	348 (86.8%)
Yes, *N* (%)	14 (12.6%)	10 (9.0%)	30 (15.5%)	35 (18.1%)	8 (8.2%)	8 (8.2%)	52 (13.0%)	53 (13.2%)
Topical anti-inflammatory drugs (e.g., cream)								
No, *N* (%)	52 (46.8%)	45 (40.5%)	150 (77.7%)	142 (73.6%)	7 (7.2%)	15 (15.5%)	209 (52.1%)	202 (50.4%)
Yes, *N* (%)	59 (53.2%)	66 (59.5%)	43 (22.3%)	51 (26.4%)	90 (92.8%)	82 (84.5%)	192 (47.9%)	199 (49.6%)
Oral anti-inflammatory drugs								
No, *N* (%)	15 (13.5%)	21 (18.9%)	67 (34.7%)	67 (34.7%)	3 (3.1%)	3 (3.1%)	85 (21.2%)	91 (22.7%)
Yes, *N* (%)	96 (86.5%)	90 (81.1%)	126 (65.3%)	126 (65.3%)	94 (96.9%)	94 (96.9%)	316 (78.8%)	310 (77.3%)
Acetaminophen (e.g., paracetamol)								
No, *N* (%)	44 (39.6%)	43 (38.7%)	44 (22.8%)	52 (26.9%)	71 (73.2%)	73 (75.3%)	159 (39.7%)	168 (41.9%)
Yes, *N* (%)	67 (60.4%)	68 (61.3%)	149 (77.2%)	141 (73.1%)	26 (26.8%)	24 (24.7%)	242 (60.3%)	233 (58.1%)
Opioid drugs								
No, *N* (%)	83 (74.8%)	91 (82.0%)	170 (88.1%)	170 (88.1%)	88 (90.7%)	88 (90.7%)	341 (85.0%)	349 (87.0%)
Yes, *N* (%)	28 (25.2%)	20 (18.0%)	23 (11.9%)	23 (11.9%)	9 (9.3%)	9 (9.3%)	60 (15.0%)	52 (13.0%)
Antidepressant drugs								
No, *N* (%)	103 (92.8%)	105 (94.6%)	182 (94.3%)	178 (92.2%)	76 (78.4%)	81 (83.5%)	361 (90.0%)	364 (90.8%)
Yes, *N* (%)	8 (7.2%)	6 (5.4%)	11 (5.7%)	15 (7.8%)	21 (21.6%)	16 (16.5%)	40 (10.0%)	37 (9.2%)
Hyaluronic acid injections								
No, *N* (%)	46 (41.4%)	55 (49.5%)	186 (96.4%)	183 (94.8%)	65 (67.0%)	82 (84.5%)	297 (74.1%)	320 (79.8%)
Yes, *N* (%)	65 (58.6%)	56 (50.5%)	7 (3.6%)	10 (5.2%)	32 (33.0%)	15 (15.5%)	104 (25.9%)	81 (20.2%)
Glucocorticoid steroid injections								
No, *N* (%)	76 (68.5%)	85 (76.6%)	121 (62.7%)	129 (66.8%)	47 (48.5%)	55 (56.7%)	244 (60.8%)	269 (67.1%)
Yes, *N* (%)	35 (31.5%)	26 (23.4%)	72 (37.3%)	64 (33.2%)	50 (51.5%)	42 (43.3%)	157 (39.2%)	132 (32.9%)
Growth factor injections and/or platelet-rich plasma								
No, *N* (%)	88 (79.3%)	97 (87.4%)	191 (99.0%)	191 (99.0%)	93 (95.9%)	92 (94.8%)	372 (92.8%)	380 (94.8%)
Yes, *N* (%)	23 (20.7%)	14 (12.6%)	2 (1.0%)	2 (1.0%)	4 (4.1%)	5 (5.2%)	29 (7.2%)	21 (5.2%)
Joint supplements (glucosamine, chondroitin)								
No, *N* (%)	61 (55.0%)	66 (59.5%)	158 (81.9%)	146 (75.6%)	37 (38.1%)	41 (42.3%)	256 (63.8%)	253 (63.1%)
Yes, *N* (%)	50 (45.0%)	45 (40.5%)	35 (18.1%)	47 (24.4%)	60 (61.9%)	56 (57.7%)	145 (36.2%)	148 (36.9%)
Homoeopathic therapies								
No, *N* (%)	104 (93.7%)	102 (91.9%)	191 (99.0%)	191 (99.0%)	85 (87.6%)	84 (86.6%)	380 (94.8%)	377 (94.0%)
Yes, *N* (%)	7 (6.3%)	9 (8.1%)	2 (1.0%)	2 (1.0%)	12 (12.4%)	13 (13.4%)	21 (5.2%)	24 (6.0%)

(Continues)

TABLE 2 | (Continued)

	Italy (*N* = 111)		Sweden (*N* = 193)		Russia (*N* = 97)		Overall (*N* = 401)	
	Suggested	**Taken**	**Suggested**	**Taken**	**Suggested**	**Taken**	**Suggested**	**Taken**
Natural therapy (topic herbal therapies, natural supplements, e.g., devil's claw, clay compress)								
No, *N* (%)	75 (67.6%)	68 (61.3%)	184 (95.3%)	179 (92.7%)	81 (83.5%)	82 (84.5%)	340 (84.8%)	329 (82.0%)
Yes, *N* (%)	36 (32.4%)	43 (38.7%)	9 (4.7%)	14 (7.3%)	16 (16.5%)	15 (15.5%)	61 (15.2%)	72 (18.0%)
Weight loss for overweight or obese people								
No, *N* (%)	32 (28.8%)	59 (53.2%)	111 (57.5%)	151 (78.2%)	46 (47.4%)	65 (67.0%)	189 (47.1%)	275 (68.6%)
Yes, *N* (%)	79 (71.2%)	52 (46.8%)	82 (42.5%)	42 (21.8%)	51 (52.6%)	32 (33.0%)	212 (52.9%)	126 (31.4%)
Maintain a healthy weight for normal weight range people								
No, *N* (%)	33 (29.7%)	50 (45.0%)	87 (45.1%)	106 (54.9%)	33 (34.0%)	51 (52.6%)	153 (38.2%)	220 (54.9%)
Yes, *N* (%)	78 (70.3%)	61 (55.0%)	119 (61.7%)	74 (38.3%)	64 (66.0%)	46 (47.4%)	248 (61.8%)	181 (45.1%)
General physical activity (yoga, tai-chi, pilates, nordic walking)								
No, *N* (%)	39 (35.1%)	51 (45.9%)	66 (34.2%)	84 (43.5%)	46 (47.4%)	65 (67.0%)	151 (37.7%)	200 (49.9%)
Yes, *N* (%)	72 (64.9%)	60 (54.1%)	127 (65.8%)	109 (56.5%)	51 (52.6%)	32 (33.0%)	250 (62.3%)	201 (50.1%)
Specific physical exercise (combination of aerobic exercise and strengthening)								
No, *N* (%)	39 (35.1%)	49 (44.1%)	31 (16.1%)	40 (20.7%)	62 (63.9%)	70 (72.2%)	132 (32.9%)	159 (39.7%)
Yes, *N* (%)	72 (64.9%)	62 (55.9%)	162 (83.9%)	153 (79.3%)	35 (36.1%)	27 (27.8%)	269 (67.1%)	242 (60.3%)
Balance training (proprioception exercises)								
No, *N* (%)	65 (58.6%)	71 (64.0%)	79 (40.9%)	83 (43.0%)	87 (89.7%)	85 (87.6%)	231 (57.6%)	239 (59.6%)
Yes, *N* (%)	46 (41.4%)	40 (36.0%)	114 (59.1%)	110 (57.0%)	10 (10.3%)	12 (12.4%)	170 (42.4%)	162 (40.4%)
Manual therapy (massage, mobilisations, manipulations)								
No, *N* (%)	60 (54.1%)	52 (46.8%)	161 (83.4%)	150 (77.7%)	56 (57.7%)	63 (64.9%)	277 (69.1%)	265 (66.1%)
Yes, *N* (%)	51 (45.9%)	59 (53.2%)	32 (16.6%)	43 (22.3%)	41 (42.3%)	34 (35.1%)	124 (30.9%)	136 (33.9%)
Orthosis or walking aids (comfortable footwear, braces or aids)								
No, *N* (%)	68 (61.3%)	67 (60.4%)	101 (52.3%)	111 (57.5%)	37 (38.1%)	45 (46.4%)	206 (51.4%)	223 (55.6%)
Yes, *N* (%)	43 (38.7%)	44 (39.6%)	92 (47.7%)	82 (42.5%)	60 (61.9%)	52 (53.6%)	195 (48.6%)	178 (44.4%)
Education programmes (e.g., goal setting, skill building, education about exercise, etc.)								
No, *N* (%)	73 (65.8%)	80 (72.1%)	94 (48.7%)	94 (48.7%)	82 (84.5%)	83 (85.6%)	249 (62.1%)	257 (64.1%)
Yes, *N* (%)	38 (34.2%)	31 (27.9%)	99 (51.3%)	99 (51.3%)	15 (15.5%)	14 (14.4%)	152 (37.9%)	144 (35.9%)
Sleep-management strategies (mindfulness, drugs, psychology etc.)								
No, *N* (%)	99 (89.2%)	102 (91.9%)	183 (94.8%)	177 (91.7%)	85 (87.6%)	81 (83.5%)	367 (91.5%)	360 (89.8%)
Yes, *N* (%)	12 (10.8%)	9 (8.1%)	10 (5.2%)	16 (8.3%)	12 (12.4%)	16 (16.5%)	34 (8.5%)	41 (10.2%)
Stress-management strategies (mindfulness, drugs, psychology etc.)								
No, *N* (%)	101 (91.0%)	102 (91.9%)	182 (94.3%)	179 (92.7%)	80 (82.5%)	79 (81.4%)	363 (90.5%)	360 (89.8%)
Yes, *N* (%)	10 (9.0%)	9 (8.1%)	11 (5.7%)	14 (7.3%)	17 (17.5%)	18 (18.6%)	38 (9.5%)	41 (10.2%)

Abbreviations: N, number; TENS, Transcutaneous Electrical Nervous System.

tai-chi and yoga, showing the lowest support for specific exercises. As in Russia, participants from Italy held an intermediate position, acknowledging radiographic importance while also expressing doubt about exercise effectiveness for severe pain. In both countries, the highest percentages of sedentary behaviours were found. Concerns about the impact of high-intensity exercise on joints with OA align with a biomechanical view of the disease, further compounded by the high reliance on radiographic findings in OA management found in Italy and Russia. Clinical decisions based on imaging may reinforce OA as a wear-and-tear disease, potentially fostering fear-avoidance behaviours (Battista et al. 2022; Battista, Salvioli et al. 2021; Darlow et al. 2018; Helminen et al. 2016; National Clinical Guidelines Centre 2014). Despite these concerns, joint loading exercises appeared safe or even positive for cartilage composition and morphology in OA (Beckwée et al. 2013; Bricca et al. 2019), showing benefits without notable differences in pain severity or joint forces between high- and low-intensity exercise

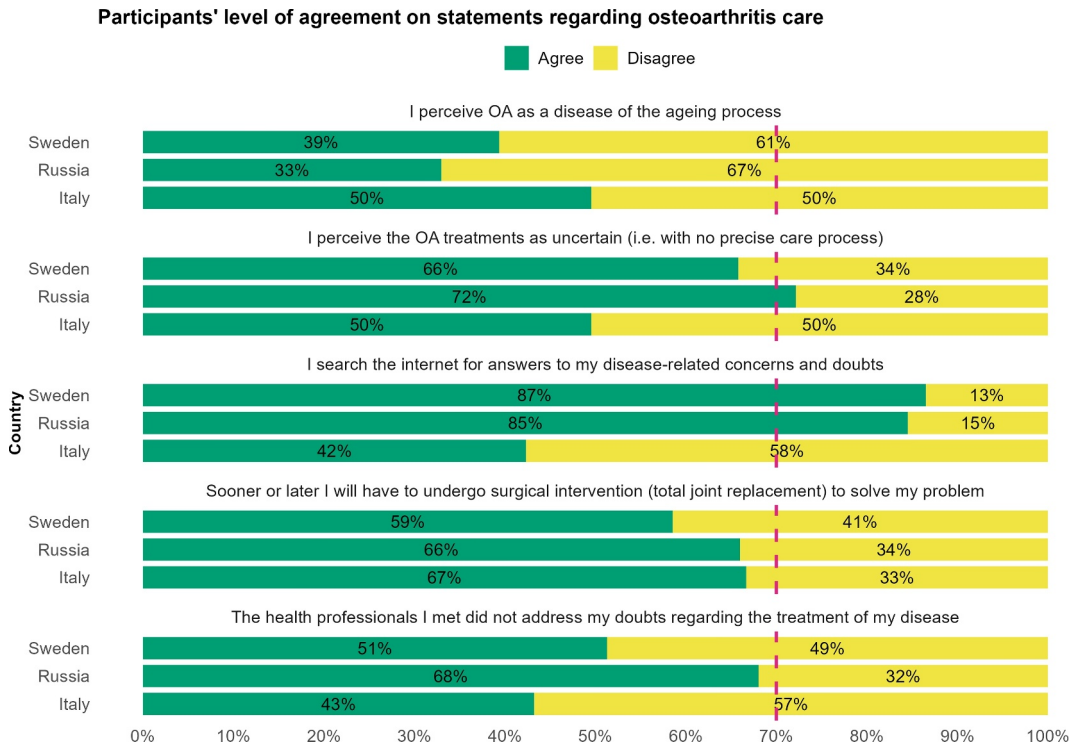

FIGURE 4 | Participants' level of agreement on statements regarding osteoarthritis care.

(Messier et al. 2021). This biomechanical perspective on OA is further posited by the inclination of Russian and Italian participants to consult orthopaedic specialists rather than healthcare professionals such as physiotherapists or sports scientists. Notably, Italy exhibited the highest percentages of both performed and recommended total joint replacements, even if they reported the shortest average disease duration and similar pain and disability levels to the other countries. This result aligns with evidence indicating a substantial surge in the total number of OA-related surgeries in Italy, registering a 262% increase with an average annual growth rate of 6.6% (Romanini et al. 2019). These trends pose challenges to the sustainability of the national healthcare system.

Concerning other first-line interventions such as diet and education, only half of the participants across all three countries regarded education as a recommended treatment. However, the majority considered diet and weight loss as such. This finding raises concerns, especially considering that OA is a long-term condition, necessitating comprehensive education for effective self-management (Moseng et al. 2024). Information provided during the early stages of OA diagnosis is crucial, as individuals often form beliefs about OA. Yet, they may receive limited advice from healthcaprofessionals, leaving them inadequately informed about the condition's aetiology and proper management strategies (Hurley et al. 2018). If individuals fail to obtain answers to their queries from a primary source (e.g., their healthcare professional), they may seek information through alternative channels, including non-evidence-based practitioners, other healthcare professionals, acquaintances, or the Internet (Chou et al. 2018; Fedutes et al. 2004). This consideration aligns with the findings of our study, wherein a substantial consensus was observed regarding the inclination to seek answers on the Internet for concerns related to the disease and in perceiving OA treatment as uncert. Moreover, these results might partially explain the overall suboptimal levels of satisfaction reported across countries. Therefore, education is a key step for the success of OA management.

Moreover, the combined approach of education, exercise, and dietary weight management proves to be more effective in alleviating individual symptoms and is cost-efficient for national healthcare systems compared to implementing each treatment in isolation (Goff et al. 2021; Mazzei et al. 2021; Moseng et al. 2024). A peculiar result was the high percentage of people reporting diet and weight loss as a recommended treatment, considering that most of our cohort across the three countries was overweight or obese. It is difficult to draw any conclusions on this finding as we did not find any agreement in the statements regarding diet-related barriers. A plausible hypothesis is that individuals may perceive various barriers simultaneously without prioritising any specific challenge over others. However, beyond the agreement, the most perceived barriers were the lack of information, the cost, and the unwillingness to change life habits, commonly reported barriers to lifestyle-changing interventions (Battista et al. 2022; Ford et al. 2011; Hardcastle et al. 2015).

The minimal role attributed to education was also evident in the levels of awareness concerning other treatments (optional and not recommended). Overall, there was a lack of awareness regarding how optional and not-recommended treatments should be approached. Individuals with OA must be cognisant of the limited benefits (and potential harms) associated with non-recommended treatments, aiming to prevent the inefficient allocation of resources and time that could otherwise be directed towards evidence-based interventions. Notably, Italy and Russia

exhibited a tendency towards more passive engagement with optional and not-recommended treatments compared to Sweden. These findings underscore persistent disparities in healthcare for OA across Europe, highlighting the need to bridge these gaps to provide individuals with long-term condition access to high-quality care. Sweden has shown a specific commitment to enhancing OA healthcare, exemplified by implementing the Supported OsteoArthritis Self-Management Programme (SOASP) in 2008 within the Swedish national healthcare system (Thorstensson et al. 2015). The programme, recorded in the Swedish Osteoarthritis Registry, has benefited over 190,000 people with OA (Battista et al. 2023b). Grounded in education and exercise provided by a physiotherapist, following Swedish OA CPG, the programme has expanded its reach through an online platform (Battista et al. 2024). In contrast, similar programs are lacking in Italy and Russia, highlighting the potential for integrating comparable healthcare models into their national healthcare systems.

The main limitation of this study is that the findings are derived from a voluntary online survey without a calculated response rate, introducing the possibility of sampling bias, and impacting the generalisability of the findings. Moreover, it was impossible to understand the characteristics of those who did not respond. Since participants self-reported their OA diagnosis, we must acknowledge this uncertainty, as we cannot be entirely confident in the accuracy of their diagnosis. However, individuals with higher literacy levels and access to technology might have been more likely to participate. Despite this limitation, the study's strengths lie in being the first to provide a comprehensive overview of OA management in the 3 European countries. Additionally, the survey instrument was developed with patient and public involvement, ensuring content validity, and it was grounded in major OA CPGs.

5 | Conclusion

The findings of this study underscore the need for a comprehensive approach to educating individuals with OA, providing a thorough overview of treatment options (recommended or not) to facilitate shared decision-making with healthcare professionals. Disparities in OA management were found, with Swedish participants receiving healthcare focused on first-line interventions, while the other countries leaned more towards passive treatments. Our findings give rise to the latest EULAR recommendations on OA, emphasising the crucial need to enhance the population's awareness of the role and benefits of evidence-based OA management.

Author Contributions

S.B., M.T., P.P., M.N. and A.D. conceptualised the presented idea. S.B., M.T., P.P., M.N. and A.D. designed and developed the methodology of this study. S.B., P.P., M.N. and A.D. contributed to disseminating the survey. S.B., F.R., B.G. and A.D. conducted the formal analysis of data. S.B., B.G., F.R. and A.D. wrote the original draft. All authors reviewed and edited the final manuscript.

Acknowledgements

Preliminary data of this work was presented as a poster at the EULAR Congress 2022 and published as an abstract: http://dx.doi.org/10.1136/annrheumdis-2022-eular.1338. We would like to thank Ugo Viora for his insight into the creation of the survey instrument and for helping to disseminate the survey in Italy.

Ethics Statement

In Italy, ethical approval was obtained from the Ethics Committee for University Research (CERA: Comitato Etico per la Ricerca di Ateneo), University of Genova (approval date: 15/06/2020; CERA2020.07). No Ethics Committee approvals were necessary in Sweden and Russia for this kind of study (web-based survey anonymised at the source).

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that supports the findings of this study are available in the supplementary material of this article.

References

Bannuru, R. R., M. C. Osani, E. E. Vaysbrot, et al. 2019. "OARSI Guidelines for the Non-Surgical Management of Knee, Hip, and Polyarticular Osteoarthritis." *Osteoarthritis and Cartilage* 27, no. 11: 1578–1589. https://doi.org/10.1016/j.joca.2019.06.011.

Basedow, M., and A. Esterman. 2015. "Assessing Appropriateness of Osteoarthritis Care Using Quality Indicators: A Systematic Review." *Journal of Evaluation in Clinical Practice* 21, no. 5: 782–789. https://doi.org/10.1111/jep.12402.

Battista, S., A. Dell'Isola, M. Manoni, M. Englund, A. Palese, and M. Testa. 2021. "Experience of the COVID-19 Pandemic as Lived by Patients With Hip and Knee Osteoarthritis: An Italian Qualitative Study." *BMJ Open* 11, no. 10: e053194. https://doi.org/10.1136/BMJOPEN-2021-053194.

Battista, S., A. Kiadaliri, T. Jönsson, et al. 2023a. "Factors Associated With Adherence to a Supervised Exercise Intervention for Osteoarthritis: Data From the Swedish Osteoarthritis Registry." *Arthritis Care & Research* 75, no. 10: 2117–2126. https://doi.org/10.1002/ACR.25135.

Battista, S., A. Kiadaliri, T. Jönsson, et al. 2023b. "Income-Related Inequality Changes in Osteoarthritis First-Line Interventions: A Cohort Study." *Archives of Physical Medicine and Rehabilitation* 452–460. https://doi.org/10.1016/j.apmr.2023.10.012.

Battista, S., L. S. Lohmander, A. Dell'Isola, L. E. Dahlberg, and A. Kiadaliri. 2024. "Sex and Age Differences in the Patient-Reported Outcome Measures and Adherence to an Osteoarthritis Digital Self-Management Intervention." *Osteoarthritis and Cartilage Open* 6, no. 1: 100437. https://doi.org/10.1016/J.OCARTO.2024.100437.

Battista, S., M. Manoni, A. Dell'Isola, M. Englund, A. Palese, and M. Testa. 2022. "Giving an Account of Patients' Experience: A Qualitative Study on the Care Process of Hip and Knee Osteoarthritis." *Health Expectations* 25, no. 3: 1140–1156. https://doi.org/10.1111/hex.13468.

Battista, S., S. Salvioli, S. Millotti, M. Testa, and A. Dell'Isola. 2021. "Italian Physiotherapists' Knowledge of and Adherence to Osteoarthritis Clinical Practice Guidelines: A Cross-Sectional Study." *BMC Musculoskeletal Disorders* 22, no. 1: 380. https://doi.org/10.1186/s12891-021-04250-4.

Beaton, D. E., C. Bombardier, F. Guillemin, and M. B. Ferraz. 2000. "Guidelines for the Process of Cross-Cultural Adaptation of Self-Report Measures." *Spine* 25, no. 24: 3186–3191. https://doi.org/10.1097/00007632-200012150-00014.

Beckwée, D., P. Vaes, M. Cnudde, E. Swinnen, and I. Bautmans. 2013. "Osteoarthritis of the Knee: Why Does Exercise Work? A Qualitative Study of the Literature." *Ageing Research Reviews* 12, no. 1: 226–236. https://doi.org/10.1016/J.ARR.2012.09.005.

Bricca, A., C. B. Juhl, M. Steultjens, W. Wirth, and E. M. Roos. 2019. "Impact of Exercise on Articular Cartilage in People at Risk of, or With Established, Knee Osteoarthritis: A Systematic Review of Randomised Controlled Trials." *British Journal of Sports Medicine* 53, no. 15: 940–947. https://doi.org/10.1136/BJSPORTS-2017-098661.

Caffini, G., S. Battista, A. Raschi, and M. Testa. 2022. "Physiotherapists' Knowledge of and Adherence to Evidence-Based Practice Guidelines and Recommendations for Ankle Sprains Management: A Cross-Sectional Study." *BMC Musculoskeletal Disorders* 23, no. 1: 1–12. https://doi.org/10.1186/S12891-022-05914-5/FIGURES/2.

Chou, L., L. Ellis, M. Papandony, et al. 2018. "Patients' Perceived Needs of Osteoarthritis Health Information: A Systematic Scoping Review." *PLoS One* 13, no. 4: e0195489. https://doi.org/10.1371/journal.pone.0195489.

Cutolo, R., S. Battista, and M. Testa. 2021. "Actual and Perceived Level of Scientific English Across Italian Physiotherapy Courses: A Cross-Sectional Study." *Healthcare (Switzerland)* 9, no. 9: 1135. https://doi.org/10.3390/healthcare9091135.

Darlow, B., M. Brown, B. Thompson, et al. 2018. "Living With Osteoarthritis is a Balancing Act: An Exploration of Patients' Beliefs About Knee Pain." *BMC Rheumatology* 2, no. 1: 15. https://doi.org/10.1186/s41927-018-0023-x.

de Leeuw, D., J. Hox, and D. Dillman. 2008. *International Handbook of Survey Methodology*. 1st ed. New York: Taylor and Francis Group.

Dobson, F., K. L. Bennell, S. D. French, et al. 1 May 2016. "Barriers and Facilitators to Exercise Participation in People With Hip and/or Knee Osteoarthritis: Synthesis of the Literature Using Behavior Change Theory." *American Journal of Physical Medicine and Rehabilitation* 95, no. 5: 372–389. https://doi.org/10.1097/PHM.0000000000000448.

Egerton, T., L. E. Diamond, R. Buchbinder, K. L. Bennell, and S. C. Slade. 1 May 2017. "A Systematic Review and Evidence Synthesis of Qualitative Studies to Identify Primary Care Clinicians' Barriers and Enablers to the Management of Osteoarthritis." *Osteoarthritis and Cartilage* 25, no. 5: 625–638. https://doi.org/10.1016/j.joca.2016.12.002.

Fedutes, B., T. Starz, M. Vogt, R. Weber, and N. Ansani. 2004. "Gauging Patients' Interest in an Arthritis Web Site." *American Journal of Health-System Pharmacy* 61, no. 13: 1338–1339. https://doi.org/10.1093/AJHP/61.13.1338.

Fernandes, L., K. B. Hagen, J. W. J. Bijlsma, et al. July 2013. "EULAR Recommendations for the Non-Pharmacological Core Management of Hip and Knee Osteoarthritis." *Annals of the Rheumatic Diseases* 72, no. 7: 1125–1135. https://doi.org/10.1136/annrheumdis-2012-202745.

Ford, E., G. Zhao, J. Jtsai, and C. Li. 2011. "Low-Risk Lifestyle Behaviors and All-Cause Mortality: Findings From the National Health and Nutrition Examination Survey III Mortality Study." *American Journal of Public Health* 101, no. 10: 1922–1929. https://doi.org/10.2105/AJPH.2011.300167.

Goff, A. J., D. De Oliveira Silva, M. Merolli, E. C. Bell, K. M. Crossley, and C. J. Barton. 2021. "Patient Education Improves Pain and Function in People With Knee Osteoarthritis With Better Effects When Combined With Exercise Therapy: A Systematic Review." *Journal of Physiotherapy* 67, no. 3: 177–189. https://doi.org/10.1016/J.JPHYS.2021.06.011.

Hardcastle, S. J., J. Hancox, A. Hattar, C. Maxwell-Smith, C. Thøgersen-Ntoumani, and M. S. Hagger. 2015. "Motivating the Unmotivated: How Can Health Behavior Be Changed in Those Unwilling to Change?" *Frontiers in Psychology* 6: 835. https://doi.org/10.3389/FPSYG.2015.00835.

Helminen, E.-E., S. H. Sinikallio, A. L. Valjakka, R. H. Väisänen-Rouvali, and J. P. Arokoski. 2016. "Determinants of Pain and Functioning in Knee Osteoarthritis: A One-Year Prospective Study." *Clinical Rehabilitation* 30, no. 9: 890–900. https://doi.org/10.1177/0269215515619660.

Hurley, M., K. Dickson, R. Hallett, et al. 2018. "Exercise Interventions and Patient Beliefs for People With Hip, Knee or Hip and Knee Osteoarthritis: A Mixed Methods Review." *Cochrane Database of Systematic Reviews* 4, no. 4: CD010842. https://doi.org/10.1002/14651858.CD010842.PUB2.

Jones, B., M. Ndosi, A. Hunt, D. Harcourt, and E. Dures. 2021. "Factors Associated With Patient Activation in Inflammatory Arthritis: A Multisite Cross-Sectional Study." *Rheumatology Advances in Practice* 5, no. Suppl 2: II35–II44. https://doi.org/10.1093/RAP/RKAB053.

Kabalyk, M. A. 2018. "Prevalence of Osteoarthritis in Russia: Regional Aspects of Trends in Statistical Parameters During 2011–2016." *Nauchno-Prakticheskaya Revmatologiya* 56, no. 4: 416–422. https://doi.org/10.14412/1995-4484-2018-416-422.

Kanavaki, A. M., A. Rushton, N. Efstathiou, et al. 1 December 2017. "Barriers and Facilitators of Physical Activity in Knee and Hip Osteoarthritis: A Systematic Review of Qualitative Evidence." *BMJ Open* 7, no. 12: e017042. https://doi.org/10.1136/bmjopen-2017-017042.

Kiadaliri, A. A., L. S. Lohmander, M. Moradi-Lakeh, I. F. Petersson, and M. Englund. 2018. "High and Rising Burden of Hip and Knee Osteoarthritis in the Nordic Region, 1990–2015: Findings From the Global Burden of Disease Study 2015." *Acta Orthopaedica* 89, no. 2: 177–183. https://doi.org/10.1080/17453674.2017.1404791.

Kingsbury, S. R., H. J. Gross, G. Isherwood, and P. G. Conaghan. 2014. "Osteoarthritis in Europe: Impact on Health Status, Work Productivity and Use of Pharmacotherapies in Five European Countries." *Rheumatology* 53, no. 5: 937–947. https://doi.org/10.1093/RHEUMATOLOGY/KET463.

Kolasinski, S. L., T. Neogi, M. C. Hochberg, et al. 2020. "2019 American College of Rheumatology/Arthritis Foundation Guideline for the Management of Osteoarthritis of the Hand, Hip, and Knee." *Arthritis & Rheumatology* 72, no. 2: 220–233. https://doi.org/10.1002/ART.41142/.

Mazzei, D. R., A. Ademola, J. H. Abbott, T. Sajobi, K. Hildebrand, and D. A. Marshall. 2021. "Are Education, Exercise and Diet Interventions a Cost-Effective Treatment to Manage Hip and Knee Osteoarthritis? A Systematic Review." *Osteoarthritis and Cartilage* 29, no. 4: 456–470. https://doi.org/10.1016/j.joca.2020.10.002.

Messier, S. P., S. L. Mihalko, D. P. Beavers, et al. 2021. "Effect of High-Intensity Strength Training on Knee Pain and Knee Joint Compressive Forces Among Adults With Knee Osteoarthritis: The START Randomized Clinical Trial." *JAMA* 325, no. 7: 646–657. https://doi.org/10.1001/JAMA.2021.0411.

Moseng, T., T. P. M. V. Vlieland, S. Battista, et al. 2024. "EULAR Recommendations for the Non-Pharmacological Core Management of Hip and Knee Osteoarthritis: 2023 Update." *Annals of the Rheumatic Diseases* 83, no. 6: 730–740. https://doi.org/10.1136/ARD-2023-225041.

National Clinical Guidelines Centre. 2014. "Osteoarthritis: Care and Management in Adults." *NICE Clinical Guidelines* 177: 1–498.

Osservatorio Nazionale sulla Salute nelle Regioni Italiane. 2022. Rapporto Osservasalute 2022. https://osservatoriosullasalute.it/osservasalute/rapporto-osservasalute-2022.

Romanini, E., F. Decarolis, I. Luzi, et al. 2019. "Total Knee Arthroplasty in Italy: Reflections From the Last Fifteen Years and Projections for the Next Thirty." *International Orthopaedics* 43, no. 1: 133–138. https://doi.org/10.1007/s00264-018-4165-7.

Runciman, W. B., T. D. Hunt, N. A. Hannaford, et al. 2012. "CareTrack: Assessing the Appropriateness of Health Care Delivery in Australia." *Medical Journal of Australia* 197, no. 2: 100–105. https://doi.org/10.5694/MJA12.10510.

Safiri, S., A. A. Kolahi, E. Smith, et al. 2020. "Global, Regional and National Burden of Osteoarthritis 1990–2017: A Systematic Analysis of

the Global Burden of Disease Study 2017." *Annals of the Rheumatic Diseases* 79, no. 6: 819–828. https://doi.org/10.1136/ANNRHEUMDIS-2019-216515.

Staniszewska, S., J. Brett, I. Simera, et al. 2017. "GRIPP2 Reporting Checklists: Tools to Improve Reporting of Patient and Public Involvement in Research." *Research Involvement and Engagement* 3, no. 1: 1–11. https://doi.org/10.1186/S40900-017-0062-2/TABLES/4.

Theis, K. A., T. J. Brady, and J. J. Sacks. 2018. "Where Have All the Patients Gone? Profile of US Adults Who Report Doctor-Diagnosed Arthritis But Are Not Being Treated." *Journal of Clinical Rheumatology* 25, no. 8: 341–347. https://doi.org/10.1097/rhu.0000000000000896.

Thorstensson, C. A., G. Garellick, H. Rystedt, and L. E. Dahlberg. 2015. "Better Management of Patients With Osteoarthritis: Development and Nationwide Implementation of an Evidence-Based Supported Osteoarthritis Self-Management Programme." *Musculoskeletal Care* 13, no. 2: 67–75. https://doi.org/10.1002/msc.1085.

von Elm, E., D. Altman, M. Egger, et al. 2007. "The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement: Guidelines for Reporting Observational Studies." *Annals of Internal Medicine* 147, no. 8: 573–578. https://doi.org/10.7326/0003-4819-147-8-200710160-00010.

Woolf, A. D., H. Zeidler, U. Haglund, et al. 2004. "Musculoskeletal Pain in Europe: Its Impact and a Comparison of Population and Medical Perceptions of Treatment in Eight European Countries." *Annals of the Rheumatic Diseases* 63, no. 4: 342–347. https://doi.org/10.1136/ARD.2003.010223.

Zhang, W., M. Doherty, G. Peat, et al. 2010. "EULAR Evidence-Based Recommendations for the Diagnosis of Knee Osteoarthritis." *Annals of the Rheumatic Diseases* 69, no. 3: 483–489. https://doi.org/10.1136/ARD.2009.113100.

Supporting Information

Additional supporting information can be found online in the Supporting Information section.