Conservative non-pharmacological management of knee osteoarthritis in Switzerland: a survey among medical specialists

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Abstract

Background: International Guidelines recommend self-management, exercise and weight management if appropriate as first line conservative treatment for patients with knee osteoarthritis (OA). The objective of this study was to survey the conservative non-pharmacological management of patients with knee OA in Switzerland and to explore perceived barriers and facilitators for the application of guideline recommendations.

Methods: Based on the results of semi-structured interviews with selected general practitioners (GPs), rheumatologists and orthopaedic surgeons, a survey was performed across their scientific societies. Questions addressed diagnostic measures, treatment options, reasons for referral to exercise as well as barriers and facilitators.

Results: In total, 234 members responded. They indicated that usually patients presented due to pain (n=222, 98.2%) and functional limitations of the knee (n=151, 66.8%). Additionally to clinical assessment X-ray (n=214, 95.5%) and MRI (n=70, 31.3%) were used as diagnostic measures. The referral to exercise, was driven by the patients' expectation/high level of suffering (n=73, 37.1%), as well as by their own clinical experience (n=49, 24.9%). They estimated to refer 54% of their patients to exercise. Further, the specialists rated as the most important barriers for the referral to exercise 'disinterest of patient' (n=88, 46.3%) and 'physically active patient' (n=59, 31.1%). As most important facilitators, they rated 'priority to mention exercise during short time of consultation' (n=170, 89.4%) and 'insufficiently physically active patient' (n=165, 86.9%).

Conclusion: A substantial evidence-performance gap in the management of patients with knee OA seems to be present. To successfully support systematic referral to exercise as first line intervention, it may be important to not simply suggest exercise in general, but a specific best-practice exercise and education programme for knee OA.

Background

Knee osteoarthritis (OA) is a progressive chronic disorder and the greatest cause of years living with a disability in people over 50 years worldwide (1). A fifth of the people over 50 years and half of the world's population over 65 years is diagnosed with OA, particularly knee OA (2,3,4). In clinical practice, diagnosis is made by clinical symptoms, and often by radiography and MRI. The European League Against Rheumatism (EULAR) recommendations for the use of imaging in the clinical management of peripheral joint OA assert, based on some evidence, that imaging is not required for diagnosis in patients with typical presentation of symptomatic OA such as suffering of pain and limitation of function (4). With regard to treatment options, meta-analyses showed high quality evidence of the positive effects of exercise on the reduction of pain and on quality of life (5–7). American College of Rheumatology (ACR), EULAR and OA Research Society International (OARSI) clinical guidelines for the management of knee OA recommend individualized management including patient-education and exercise (e.g. strengthening exercise), as well as weight management if appropriate (6,8–10). These elements should be used, as first line conservative treatment for patients with knee OA with the aim to support the patients' self-management. Education, exercise, and weight control if appropriate, should be offered to all patients with knee OA, whereas some patients additionally will need second line treatment, i.e. pharmacological therapy and passive treatment provided by therapists (6,7,9–11). However only few patients, estimated 10–15%, will need surgery directly (12).

Also in Switzerland, knee OA is among the most prevalent non-communicable diseases (NCDs) (13). Knee OA is one of the most frequent diagnosis in Swiss hospitals and the number of annual total knee joint replacement (TKR) surgeries increased by 114% between 2003 and 2014. This may be due to the demographic changes, however there seems to be a trend, nationally and internationally, of undergoing TKR surgery earlier in life than in the past (6,14,15).

In Switzerland, there here is only sparse information about the conservative management prior to surgery (16). In many countries, joint pain and knee OA are mainly managed in primary care (2,11,17). This may be the case also in Switzerland, as the first contact for patients with knee OA symptoms is usually the general practitioner (GP), however Swiss residents have free access (without referral) to specialists unless enrolled in a gatekeeping managed care plan (18). Thus, patients have also direct access to other specialists, such as rheumatologists and orthopaedic surgeons, who therefore may also be involved in the management of patients with knee pain and knee OA.

A recent study strongly recommended exercise as effective prevention of knee OA (19). This is important given the challenges the health care system is facing with increasing costs, an ageing population and the increase of obesity (11). Observation in clinical practice suggests that despite the high-quality evidence of the effectiveness and cost-effectiveness of exercise, the conservative non-pharmacological treatment may be underused in Switzerland. Research identified different barriers such as incentives, the outcome expectations of health care providers about the effectiveness of exercise or a lack of information on its potential in the general public and the patients (20). Moreover, long-term adherence to exercising is a challenge as it requires behavioural change in patients and appropriate support by health care providers (21).

The purpose of this study was to survey the conservative non-pharmacological management of patients with knee OA of GPs, rheumatologists and orthopaedic surgeons in Switzerland, and to evaluate what drives their decision-making towards (or against) exercise and patient education, as first line interventions. A further aim was to explore the perceived barriers and facilitators for the application of guideline recommendations.

Methods

Study design

An exploratory sequential mixed method design, was used to explore and evaluate the treatment options in the conservative management of knee OA patients (22). Firstly, semi-structured interviews were performed (qualitative part), followed by a cross-sectional online survey (quantitative part).

Development of the survey

The online survey was developed based on literature and semi-structured interviews with GPs, rheumatologists and orthopaedic surgeons selected with regard to gender, region and language area. Eleven telephone interviews, lasting between 5 and 15 minutes, were conducted. The interview questions were related to the domains 1) consultation reasons of patients and diagnostic measures additional to the clinical assessment; 2) conservative treatment options; 3) reasons for referral to exercise, and 4) barriers and facilitators for referral to exercise. The analysis was performed using a directed content analysis (23), i.e. with regard to the recommendations of clinical guidelines, and the results informed the survey questions. The final version of the survey contained 14 questions within the above mentioned four domains: 1) consultation reasons and diagnostic measures, two questions on main symptoms presented by patients and the use of diagnostic measures in addition to clinical assessment; 2) treatment options in conservative knee OA treatment, assessed on a Likert scale from 3 (always) to 0 (never); 3) reasons for referral to exercise, where participants were asked to prioritize five answer options from 1 to 5; and 4) barriers and facilitators for referral to exercise, as recommended by the guidelines, assessed on a Likert scale from 5 (I fully agree) to 1 (I disagree). Additionally, the rate of referring their patients (%) to exercise and indication criteria for referring to surgery were inquired. Six questions on the survey participants' characteristics and their work with knee OA patients were asked initially. After pilot testing with three specialists and three researchers, the survey was slightly modified to improve its clarity. The survey was kept as short as possible, i.e. less than 10 minutes for completion, taking into account the limited time of physicians busy with clinical work (24).

Recruitment of survey participants and data collection

GPs, rheumatologists and orthopaedic surgeons in the German, French and Italian language areas in Switzerland were invited to participate in the online survey by their societies, i.e. the Swiss family physicians and paediatricians association (mfe, 4764 members), the Swiss Society of Rheumatology (SGR, 570 members) and the Swiss society of orthopaedics and traumatology (swiss orthopaedics, 759 members). The surveys were sent as links to access a German, French or English version, using Survey Monkey®. The SGR sent a reminder to their members after three weeks.

Data analysis

Demographics and work characteristics of survey participants are presented as frequencies and percentages or means and standard deviations where appropriate. To test the significance of differences between the subgroups, variance analysis (one-factor ANOVA) was applied where appropriate and the Likert scales were dichotomized for group comparison, i.e. the answer options always/often and the answer options seldom/never, and additional the answer option "I don't know".

Descriptive statistics were performed using the SPSS software, version 25 (SPSS, Chicago, IL.).

Results

Characteristics of participants

A total of 5980 specialists of the three medical societies were invited to participate in the survey and 234 (3.91%) responded. Responders were included for analysis if they answered, additional to the demographic questions, at least the three questions concerning consultation reasons, diagnostic measures and treatment options in conservative knee OA management. This resulted in 226 specialists for analysis, among them 72 GPs, 84 rheumatologists and 70 orthopaedic surgeons. Their characteristics are reported in Table 1.

Table 1. Characteristics of the survey participants (n = 226)

	All (n = 226)	GPs (n = 72)	Rheumatologists (n = 84)	Orthopaedic surgeons (n = 70)
Female, n (%)	53 (23.5)	30 (41.7)	20 (23.8)	3 (4.3)
Clinical experience, years	21.02 (10.23)	23.60 (11.29)	21.90 (9.51)	17.31 (8.92)
Workload (%)	83.89 (30.17)	71.46 (31.33)	82.62 (29.00)	98.21 (23.99)
Number of knee OA diagnosis performed per month	13.52 (22.15)	3.82 (3.823)	11.09 (13.58)	26.56 (32.81)
Number of patients with knee OA treated per month	20.06 (25.70)	10.99 (17.46)	19.12 (20.04)	30.45 (33.69)

Notes: Values are means (S.D.) unless stated otherwise

Survey results

Consultation reasons and diagnostic measures additional to the clinical assessment

Pain in the knee joint (n = 222, 98.2%) and limited function (n = 151, 66.8%) were reported to be the main reasons for patients to consult a specialist. The rate of patients with 'referrals from other doctors' varied substantially across specialists' subgroups, from 2.8% in GPs to 91.5% in orthopaedic surgeons (Table 2).

Table 2. Perceived main reasons of patients to seek medical advice (n = 226)

		Always	Often	Seldom	Never
Pain in the knee joint	All (n = 226)	141 (62.4)	81 (35.8)	3 (1.3)	1 (0.4)
	GPs (n = 72)	50 (69.4)	22 (30.6)	3 (3.6)	1 (1.2)
	Rheum. (n = 84)	51 (60.7)	29 (34.5)		
	Orthop. (n = 70)	40 (57.1)	30 (42.9)		
Limited function of the knee joint	All (n = 226)	9 (4.0)	142 (62.8)	71 (31.4)	4 (1.8)
	GPs (n = 72)	2 (2.8)	43 (59.7)	27 (37.5)	3 (3.6)
	Rheum. (n = 84)	3 (3.6)	57 (67.9)	21 (25.0)	1 (1.4)
	Orthop. (n = 70)	4 (5.7)	42 (60.0)	23 (32.9)	
Referral from other medical doctors	All (n = 226)	18 (8.0)	114 (50.4)	34 (15.0)	60 (26.5)
	GPs (n = 72)	9 (10.7)	2 (2.8)	12 (16.7)	58 (80.6)
	Rheum. (n = 84)	9 (12.9)	57 (67.9)	17 (20.2)	1 (1.2)
	Orthop. (n = 70)		55 (78.6)	5 (7.1)	1 (1.4)
Stiffness of the knee joint	All (n = 226)	7 (3.1)	98 (43.4)	118 (52.2)	3 (1.3)
	GPs (n = 72)	3 (4.2)	31 (43.1)	37 (51.4)	1 (1.4)
	Rheum. (n = 84)	1 (1.2)	43 (51.2)	38 (45.2)	2 (2.4)
	Orthop. (n = 70)	3 (4.3)	24 (34.3)	43 (61.4)	
Because of another diagnosis	All (n = 226)	6 (2.7)	79 (35.0)	131 (58.0)	10 (4.4)
	GPs (n = 72)	1 (1.4)	29 (40.3)	41 (56.9)	1 (1.4)
	Rheum. (n = 84)	4 (4.8)	41 (48.8)	37 (44.0)	2 (2.4)
	Orthop. (n = 70)	1 (1.4)	9 (12.9)	53 (75.7)	7 (10.0)

Notes: Values are absolute and relative frequencies.

Items are in a ranked order only in the analysis regarding 'All participants'.

Rheum. Rheumatologists

Orthop. Orthopaedic surgeons

The use of multiple additional diagnostic measures when clinical signs indicated knee OA are displayed in Fig. 1. Irrespective of the medical discipline, X-ray (n = 214; 95.5%) was the most used diagnostic measure to confirm the clinical diagnosis. MRI was substantially less used (n = 70; 31.3%), and of these, mainly by orthopaedic surgeons (n = 40; 57.1%).

Conservative treatment options

The conservative treatment options most mentioned by all specialists were 'informing the patients about the diagnosis' (n = 223; 98.6%), 'recommending suitable activities or sports' (n = 217; 96%), 'pharmacological treatment' (n = 203; 89.8%) and 'referral to physiotherapy' (n = 188; 83.2%). There were no differences among the subgroups in all these treatment options (p = 0.056). The only difference across the subgroups was in 'referral to other medical health specialist', what 26.6% of the GPs 'always' or 'often' did, compared to 6% of the rheumatologists and 10% of the orthopaedic surgeons (p = 0.000) (Table 3).

Table 3
Conservative treatment options used after diagnosing knee OA (n = 226)

		Always	Often	Seldom	Never
Patient education/ Informed patient (diagnosis)	All (n = 226)	215 (95.1)	8 (3.5)	1 (0.4)	2 (0.9)
	GPs (n = 72)	68 (94.4)	2 (2.8)	1 (1.4)	1 (1.4)
	Rheum. (n = 84)	81 (96.4)	2 (2.4)		1 (1.2)
	Orthop. (n = 70)	66 (94.3)	4 (5.7)		
Instruction: suitable activities/sports	All (n = 226)	153 (67.7)	64 (28.3)	8 (3.5)	1 (0.4)
	GPs (n = 72)	46 (63.9)	20 (27.8)	6 (8.3)	1 (1.2)
	Rheum. (n = 84)	61 (72.6)	21 (25.0)	1 (1.2)	
	Orthop. (n = 70)	46 (65.7)	23 (32.9)	1 (1.4)	
Pharmacological treatment	All (n = 226)	52 (23.0)	151 (66.8)	21 (9.3)	2 (0.9)
	GPs (n = 72)	13 (18.1)	51 (70.8)	8 (11.1)	1 (1.2)
	Rheum. (n = 84)	23 (27.4)	55 (65.5)	5 (6.0)	1 (1.4)
	Orthop. (n = 70)	16 (22.9)	45 (64.3)	8 (11.4)	
Referral to physical therapist	All (n = 226)	40 (17.7)	148 (65.5)	35 (15.5)	3 (1.3)
	GPs (n = 72)	11 (15.3)	51 (70.8)	9 (12.5)	1 (1.4)
	Rheum. (n = 84)	19 (22.6)	55 (65.5)	9 (10.7)	1 (1.2)
	Orthop. (n = 70)	10 (14.3)	42 (60.0)	17 (24.3)	1 (1.4)
Instruction of specific exercises (e.g. strength exercises)	All (n = 226)	79 (35.0)	107 (47.3)	37 (16.4)	3 (1.3)
	GPs (n = 72)	23 (31.9)	31 (43.1)	17 (23.6)	1 (1.4)
	Rheum. (n = 84)	33 (39.3)	38 (45.2)	11 (13.1)	2 (2.4)
	Orthop. (n = 70)	23 (32.9)	38 (54.3)	9 (12.9)	
Instruction: weight reduction	All (n = 226)	74 (32.7)	108 (47.8)	41 (18.1)	3 (1.3)
	GPs (n = 72)	27 (37.5)	33 (45.8)	11 (15.3)	1 (1.4)
	Rheum. (n = 84)	30 (35.7)	37 (44.0)	15 (17.9)	2 (2.4)
	Orthop. (n = 70)	17 (24.3)	38 (54.3)	15 (21.4)	
Load removal through crutches/canes, orthosis	All (n = 226)	3 (1.3)	40 (17.7)	159 (70.4)	24 (10.6)
	GPs (n = 72)	2 (2.8)	13 (18.1)	49 (68.1)	8 (11.1)
	Rheum. (n = 84)	1 (1.2)	15 (17.9)	61 (72.6)	7 (8.3)
	Orthop. (n = 70)		12 (17.1)	49 (70.0)	9 (12.9)
Referral to other medical health specialist	All (n = 226)	2 (0.9)	29 (12.8)	159 (70.4)	36 (15.9)
	GPs (n = 72)	2 (2.8)	17 (23.6)	53 (73.6)	12 (14.3)
	Rheum. (n = 84)		5 (6.0)	67 (79.8)	24 (34.3)
	Orthop. (n = 70)		7 (10.0)	39 (55.7)	
Notes: Values are absolute and relative frequencies. Items are in a ranked order only in the analysis regarding 'All participants'.					
Rheum. Rheumatologists. Orthop. Orthopaedic surgeons					

Reasons for referral to exercise

A total of 226 specialists estimated to refer 53.95% (SD 27.80) of their patients to exercise. The subgroup analysis revealed no significant differences in the estimated referral to exercise ($p = 0.058$). Figure 2 displays the prioritization of the reasons for referring patients to exercise. The subgroup analysis only showed significant ($p = 0.008$) differences in prioritizing the reason "degree of osteoarthritis".

Barriers and facilitators for referral to exercise

Barriers and facilitators for referring patients with knee OA to exercise as recommended by the guidelines are displayed in Table 4.

Table 4
Barriers and facilitators for applying clinical guidelines, i.e. referral to exercise (n = 190)

		Barriers					Facilitators				
Item		Fully agree	Partly agree	I don't know	Partly disagree	Disagree	Fully agree	Partly agree	I don't know	Partly disagree	Disagree
Priority to mention exercise in the short time of consultation	All (n = 190) GPs (n = 61) Rheum. (n = 71) Orthop. (n = 58)	3 (1.6) 1 (1.6) 2 (3.4)	14 (7.4) 5 (8.2) 5 (7.0) 4 (6.9)	10 (5.3) 5 (8.2) 3 (4.2) 2 (3.4)	78 (41.1) 25 (34.7) 25 (35.2) 28 (48.3)	85 (44.7) 25 (34.7) 38 (53.5) 22 (37.9)	100 (52.6) 30 (49.2) 45 (63.4) 25 (43.1)	70 (36.8) 26 (42.6) 21 (29.6) 23 (39.7)	5 (2.6) 3 (4.9) 2 (2.8)	10 (5.3) 1 (1.6) 9 (15.5)	5 (2.6) 1 (1.6) 3 (4.2) 1 (1.7)
Availability of information about exercise	All (n = 190) GPs (n = 61) Rheum. (n = 71) Orthop. (n = 58)	1 (0.5) 1 (1.6)	26 (13.7) 9 (14.8) 7 (9.9) 10 (17.2)	15 (7.9) 6 (9.8) 3 (4.2) 6 (10.3)	86 (45.3) 29 (47.5) 29 (40.8) 28 (48.3)	62 (32.6) 16 (26.2) 32 (45.1) 14 (24.1)	37 (19.5) 11 (18.0) 21 (29.6) 5 (8.6)	79 (41.6) 23 (37.7) 24 (33.8) 32 (55.2)	25 (13.2) 11 (18.0) 8 (11.3) 6 (10.3)	45 (23.7) 15 (24.6) 15 (21.1) 15 (25.9)	4 (2.1) 1 (1.6) 3 (4.2)
Doubt of exercise's benefit/ Benefit of exercise is evidence based	All (n = 190) GPs (n = 61) Rheum. (n = 71) Orthop. (n = 58)	1 (0.5) 1 (1.4)	18 (9.5) 5 (8.2) 3 (4.2) 10 (17.2)	8 (4.2) 2 (3.3) 4 (5.6) 2 (3.4)	68 (35.8) 23 (37.7) 19 (26.8) 26 (44.8)	95 (50.0) 31 (50.8) 44 (62.0) 20 (34.5)	73 (38.4) 23 (37.7) 35 (49.3) 15 (25.9)	77 (40.5) 23 (37.7) 28 (39.4) 26 (44.8)	22 (11.6) 12 (19.7) 3 (4.2) 7 (12.1)	13 (6.8) 2 (3.3) 2 (2.8) 9 (15.5)	5 (2.6) 1 (1.6) 3 (4.2) 1 (1.7)
(Dis-)Interest of patient	All (n = 190) GPs (n = 61) Rheum. (n = 71) Orthop. (n = 58)	13 (6.8) 4 (6.6) 8 (11.3) 1 (1.7)	75 (39.5) 19 (31.1) 31 (43.7) 25 (43.1)	25 (13.2) 8 (13.1) 8 (11.3) 9 (15.5)	56 (29.5) 24 (39.3) 16 (22.5) 16 (27.6)	21 (11.1) 6 (9.8) 8 (11.3) 7 (12.1)	33 (17.4) 13 (18.1) 14 (19.7) 6 (10.3)	113 (59.5) 33 (54.1) 40 (56.3) 40 (69.0)	19 (10.0) 8 (13.1) 6 (8.5) 5 (8.6)	21 (11.1) 6 (9.8) 8 (11.3) 7 (12.1)	4 (2.1) 1 (1.6) 3 (4.2)
Patient is (not) sufficiently physically active	All (n = 190) GPs (n = 61) Rheum. (n = 71) Orthop. (n = 58)	7 (3.7) 1 (1.6) 4 (5.6) 2 (3.4)	52 (27.4) 14 (23.0) 16 (22.5) 22 (37.9)	14 (7.4) 5 (8.2) 7 (9.9) 2 (3.4)	90 (47.4) 34 (55.7) 31 (43.7) 25 (43.1)	27 (14.2) 7 (11.5) 13 (18.3) 7 (12.1)	41 (21.6) 13 (21.3) 20 (28.2) 8 (13.8)	124 (65.3) 41 (67.2) 45 (63.4) 38 (65.5)	13 (6.8) 2 (3.3) 4 (5.6) 7 (12.1)	10 (5.3) 4 (6.6) 1 (1.4) 5 (8.6)	2 (1.1) 1 (1.6) 1 (1.4)
Applicability of guideline recommendations for exercise	All (n = 190) GPs (n = 61) Rheum. (n = 71) Orthop. (n = 58)	3 (1.6) 1 (1.6) 1 (1.4) 1 (1.7)	15 (7.9) 2 (3.3) 5 (7.0) 8 (13.8)	50 (26.3) 22 (36.1) 15 (21.1) 13 (22.4)	71 (37.4) 20 (32.8) 26 (36.6) 25 (43.1)	51 (26.8) 16 (26.2) 24 (33.8) 11 (19.0)	38 (20.0) 12 (19.7) 18 (25.4) 8 (13.8)	83 (43.7) 28 (45.9) 36 (50.7) 19 (32.8)	42 (22.1) 16 (26.2) 7 (9.9) 19 (32.8)	20 (10.5) 3 (4.9) 7 (9.9) 10 (17.2)	7 (3.7) 2 (3.3) 3 (4.2) 2 (3.4)

Notes: Values are absolute and relative frequencies. Rheum. Rheumatologists. Orthop. Orthopaedic surgeons

The most important perceived barriers to were 'disinterest of patient' (46.3%) and 'physically active patient' (31.1%). 19.7% and 36.1% of the GPs, 4.2% and 21.1% of the rheumatologists and 12.1% and 22.4% of the orthopaedic surgeons chose the answer option 'I don't know' related to 'evidence base of exercise' and 'applicability of the guidelines to suggest exercise' respectively. Most rated facilitators were 'priority to mention exercise in the short time of a consultation' (n = 170; 89.4%) and 'insufficiently physically active patient' (n = 165; 86.9%). Furthermore, the 'guideline recommendations' (n = 121; 63.7%) and 'anticipated/perceived interest of patients' (n = 146; 76.9%) were stated as a facilitating factor to suggest exercise to the patients.

Indication criteria for referral to surgery (n = 226)

The most mentioned criteria for referral to surgery were 'high level of pain and suffering' (n = 142; 62.8%), 'exhaustion of conservative treatment strategies' (n = 106; 46.9%) and 'limitation of functioning in ADL' (n = 70; 31.0%). There was often a combination of two or more criteria for referral to surgery. The subgroup analysis showed differences in the main criteria for the referral to surgery, i.e. 'high level of pain and suffering' was the main criteria for the GPs (65.3%) and rheumatologists (67.9%), whereas 'exhaustion of the conservative treatment strategies' was the main criteria for the orthopaedic surgeons (57.1%).

Discussion

To our knowledge, this is the first study that surveys the conservative non-pharmacological management of patients with knee OA in Switzerland. The main finding was that the international clinical guidelines for the management of knee OA were not systematically applied in Switzerland. The (non-) adherence to

the guidelines was related to the diagnosis as well as the referral to exercise as recommended in the guidelines of knee OA. Some important barriers to and facilitators for the use of the guidelines have been detected and evaluated. As most important barriers were rated patients who were either disinterested or already physically active, whilst as most important facilitators were rated the importance of the topic exercise and patients who were insufficiently physically active.

The surveyed GPs, rheumatologists and orthopaedic surgeons reported that they most used X-ray and MRI in addition to their clinical assessment. Guideline recommendations suggest that a careful clinical examination is sufficient, unless there is any additional benefit to imaging patients as part of the diagnostic pathway or to confirm a differential diagnosis (11,25,26). The fact that orthopaedic surgeons showed a substantially higher use of MRI could be due to referrals from other specialists, thus of possibly more severe cases with knee OA to evaluate the surgical option.

There is a gap between the specialists' ratings for the treatment options, especially regarding 'referral to physiotherapy', and their estimated rate of referrals to exercise. More than 80% of the specialists chose 'referral to physiotherapy' as a treatment option, whereas the estimated rate of referrals to exercise across the subgroups was around 54%. In all subgroups, the patients' expectations or level of suffering as well as their own experience and the clinical picture, drove the decision-making for referral to exercise. Interestingly, even though the orthopaedic surgeons are the last specialists when a surgery is indicated, they did not show a lower rate of referral to exercise. They also prioritized "degree of OA" as reason for referral to exercise higher than GPs or rheumatologists. It can be assumed that orthopaedic surgeons may refer patients with lower degrees of OA to exercise and patients with higher degree of OA to surgery.

There seemed to be no systematic use of the guidelines among all specialists and therefore no systematic suggestion or referral to exercise as first line intervention. Interestingly knowledge and adherence to guidelines was comparable between the GPs and the specialists for the musculoskeletal system, i.e. rheumatologists and orthopaedic surgeons, even though GPs are more often challenged with multimorbid patients where guideline recommendations are often not systematically applicable. The only significant difference between the GPs and the specialists for the musculoskeletal system was in the referral pattern. GPs are usually primarily consulted and may refer the patients to rheumatologists and orthopaedic surgeons, who in turn see more referred patients than by direct access.

The evidence for the effectiveness of exercise in people with knee OA to reduce pain, improve physical function and quality of life in short- and long-term has been confirmed over and over in meta-analysis (5,9,19,27). Already in 2015, the Cochrane Collaboration stated that the evidence for the effects of exercise were so convincing that further studies were unlikely to change this strong and high-quality evidence (9). Previous studies showed that suboptimal use of exercise could be due to patients' preferences or lack of information about conservative treatment options (28,29). The surveyed specialists have an important impact by their own attitude and how they communicate possible treatment options. They should therefore be aware that they enhance the patients' motivation towards exercise by explaining them the positive outcomes of exercise, and support the shared decision-making towards exercise (9, 28, 29).

Overall, we conclude that there is a substantial gap between the guideline recommendations and clinical practice in the management of knee OA in Switzerland. To facilitate the guideline application and referral to exercise, it is important to translate the recommendations into a best-practice exercise programme that is of high quality and applicable in clinical practice and provide easy guidance for patients and health care providers alike. There are structured exercise and education programmes for knee OA that have been successfully established across the world, i.e. "Osteoarthritis Chronic Care Program (OACCP) Australia", "Better management of patients with osteoarthritis (BOA) Sweden", "Good Life with osteoarthritis in Denmark (GLA:D)", "Osteoarthritis Healthy Weight For Life (OA HWFL) Australia", "Amsterdam osteoarthritis cohort (AMSOA) The Netherlands" or "Joint Implementation of Osteoarthritis guidelines in the West Midlands (JIGSAW) UK" (12). All those programmes translate the guideline recommendation into practice with the goal to enhance self-management and are endorsed by OARSI. The programmes deliver the first line treatment exercise and education with different degrees of intensity and standardization. Some programmes include weight management support. The programmes have many similar contents, but differences in targeted groups of patients and health care professionals. Most programmes assess pain, function and quality of life. Such a structured exercise and education programme could be a way to overcome the evidence-performance gap in Switzerland. Further, it may support the national strategy 2017–2024 for NCDs, including musculoskeletal diseases, that emphasizes systematic disease management and patients' self-management (13). Knee OA is no longer seen as a "bone to bone" disease caused by "wear and tear" that requires quick (surgical) action, but as a long-term illness, that affects the whole person and needs effective management of the symptoms. Understanding the disease, its causes and consequences may enhance the patients' motivation towards exercise and therefore self-management (30).

For the successful implementation of a best-practice exercise and education programme, the perceived barriers and facilitators of the surveyed specialists, i.e. patients' interest in exercise or physical activity, need to be considered when developing the implementation strategy (31).

This study has some limitations. The survey focused on the conservative non-pharmacological management of knee OA, specifically the use of exercise. This was due to the perception of exercise as an underused treatment option. The specialists participating in the survey may however be genuinely more interested in exercise as therapeutic option, and therefore, selection bias may have occurred (32). Although the response rate seems quite low, it can be considered acceptable for a study that addressed participants about a topic that presumably was not their main focus (29, 34), additionally the participants were representative for their peers, i.e. the members of their respective society (35). A further limitation may be that choosing an answer through multiple-choice questions and the technically imposed need for choosing an answer option to progress with the survey may have led to choice bias or position bias (30).

Conclusion

The clinical guidelines for conservative knee OA management recommend exercise, education, and weight control if needed, as first line treatment for all people with knee OA with the goal to enhance self-management. However, there seems to be a substantial evidence-performance gap in the conservative non-pharmacological management of knee OA patients in Switzerland, i.e. the strong evidence in favour of exercise is not transferred to clinical practice.

Considering the barriers to and facilitators for a best-practice exercise and education programme may be important for a successful implementation of exercise as first line intervention for knee OA patients.

Abbreviations

OA:Osteoarthritis; GP:General practitioner; MRI:Magnetic Resonance Imaging; EULAR:European league against rheumatism; ACR:American College of Rheumatology; OARSI:Osteoarthritis Research Society International; NCD:Non-communicable disease; TKR:Total knee replacement; Mfe:Swiss family physicians and paediatricians association; SGR:Swiss Society of Rheumatology

Declarations

Ethics approval and consent to participate

This survey did not fall within the scope of the Swiss Human Research Act (34), and an authorization from the ethics committee was therefore not required. However, survey participants were informed on the starting page that by participating they provided informed consent, and the survey did not track the IP addresses to preserve participants' anonymity. The interview partners consented verbally at the telephone if they wanted to participate in the study.

Consent for publication

not applicable

Availability of data and materials

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

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

LE and KN were contributing to conception and design of the study. LE collected and analysed the data and KN, IN and EOH contributed to the drafting and revision of the manuscript. All authors have read and approved the manuscript.

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References

1. Börsch-Supan A, Brandt M, Hunkler C, Kneip T, Korbacher J, Malter F, et al. Data Resource Profile: The Survey of Health, Ageing and Retirement in Europe (SHARE). *Int J Epidemiol*. 2013;42(4):992–1001.
2. Pendleton A. EULAR recommendations for the management of knee osteoarthritis: report of a task force of the Standing Committee for International Clinical Studies Including Therapeutic Trials (ESCISIT). *Ann Rheum Dis*. 2000;59(12):936–44.
3. Postler A, Ramos AL, Goronzy J, Günther K-P, Lange T, Schmitt J, et al. Prevalence and treatment of hip and knee osteoarthritis in people aged 60 years or older in Germany: an analysis based on health insurance claims data. *Clin Interv Aging*. 2018;13:2339–49.
4. Sakellariou G, Conaghan PG, Zhang W, Bijlsma JWW, Boyesen P, D'Agostino MA, et al. EULAR recommendations for the use of imaging in the clinical management of peripheral joint osteoarthritis. *Ann Rheum Dis*. 2017;76(9):1484–94.
5. Fransen M, McConnell S, Harmer AR, Van der Esch M, Simic M, Bennell KL. Exercise for osteoarthritis of the knee. *Cochrane Musculoskeletal Group*, editor. *Cochrane Database Syst Rev* [Internet]. 2015; doi: 10.1002/14651858.CD004376.pub3
6. Fernandes L, Hagen KB, Bijlsma JWW, Andreassen O, Christensen P, Conaghan PG, et al. EULAR recommendations for the non-pharmacological core management of hip and knee osteoarthritis. *Ann Rheum Dis*. 2013;72(7):1125–35.
7. Ackerman IN, Kemp JL, Crossley KM, Culvenor AG, Hinman RS. Hip and Knee Osteoarthritis Affects Younger People, Too. *J Orthop Sports Phys Ther*. 2017;47(2):67–79.
8. Rausch Osthoff A-K, Juhl CB, Knittle K, Dagfinrud H, Hurkmans E, Braun J, et al. Effects of exercise and physical activity promotion: meta-analysis informing the 2018 EULAR recommendations for physical activity in people with rheumatoid arthritis, spondyloarthritis and hip/knee osteoarthritis. *RMD Open*. 2018;4(2):e000713.
9. Hochberg MC, Altman RD, April KT, Benkhalti M, Guyatt G, McGowan J, et al. American College of Rheumatology 2012 recommendations for the use of nonpharmacologic and pharmacologic therapies in osteoarthritis of the hand, hip, and knee. *Arthritis Care Res*. 2012;64(4):465–74.

10. McAlindon TE, Bannuru RR, Sullivan MC, Arden NK, Berenbaum F, Bierma-Zeinstra SM, et al. OARSI guidelines for the non-surgical management of knee osteoarthritis. *Osteoarthritis Cartilage*. 2014;22(3):363–88.
11. Dziedzic KS, Allen KD. Challenges and controversies of complex interventions in osteoarthritis management: recognizing inappropriate and discordant care. *Rheumatol Oxf Engl*. 2018;57(Suppl 4):iv88–98.
12. Roos EM, Juhl CB. Osteoarthritis 2012 year in review: rehabilitation and outcomes. *Osteoarthritis Cartilage*. 2012;20(12):1477–83.
13. FOPH. NCD-Strategie_2017-2024. 2016. https://gesundheitsfoerderung.ch/assets/public/documents/de/2-pgv/NCD-Strategie_2017-2024.pdf. Accessed 25 Mar 2019.
14. Falbrede I, Widmer M, Kurtz S, Schneidmüller D, Dudda M, Röder C. Verwendungsraten von Prothesen der unteren Extremität in Deutschland und der Schweiz: Ein Vergleich der Jahre 2005–2008. *Orthop*. 2011;40(9):793–801.
15. FSO. Gesundheitsstatistik 2014. Neuchâtel: Office fédéral de la statistique (OFS); 2014.
16. Federal Statistical Office Switzerland. Gesundheitsversorgungsstatistik – Ambulante Statistiken im Projekt MARS. <https://www.bfs.admin.ch/bfs/de/home/grundlagen/projekte/statistiken-ambulante-gesundheitsversorgung-mars.assetdetail.3602241.html>. Accessed 17 Aug 2019.
17. Wenzl M. The Swiss Health care system. In: *International Profiles of Health Care Systems, 2015: Australia, Canada, China, Denmark, England, France, Germany, India, Israel, Italy, Japan, The Netherlands, New Zealand, Norway, Singapore, Sweden, Switzerland, and the United States*. 2015. https://www.commonwealthfund.org/sites/default/files/documents/___media_files_publications_fund_report_2016_jan_1857_mossialos_intl_profiles_2015.pdf. Accessed 17 Aug 2019.
18. Federal office of Public Health. Zur aktuellen Situation der ärztlichen Grundversorgung. 2011. <https://www.bag.admin.ch/dam/bag/de/dokumente/cc/bundesratsberichte/2010/aerztlichen-grundversorgung.pdf.download.pdf/>. Accessed 5 June 2019.
19. Skou ST, Bricca A, Roos EM. The impact of physical activity level on the short- and long-term pain relief from supervised exercise therapy and education: a study of 12,796 Danish patients with knee osteoarthritis. *Osteoarthritis Cartilage*. 2018;26(11):1474–8.
20. Claassen AAOM, Schers HJ, Koëter S, van der Laan WH, Kremers-van de Hei KCALC, Botman J, et al. Preliminary effects of a regional approached multidisciplinary educational program on healthcare utilization in patients with hip or knee osteoarthritis: an observational study. *BMC Fam Pract*. 2018. doi: 0.1186/s12875-018-0769-7
21. Holden MA, Nicholls EE, Young J, Hay EM, Foster NE. Exercise and physical activity in older adults with knee pain: a mixed methods study. *Rheumatology*. 2015; 54(3):413–23.
22. Creswell JW, Plano Clark VL, Gutmann ML, Hanson WE. *Advanced Mixed Methods Research Designs*. *Advanced Mixed Methods Research Designs*. http://www.corwin.com/sites/default/files/upm-binaries/19291_Chapter_7.pdf. Accessed 16 Sep 2019.
23. Hsieh H-F, Shannon SE. Three Approaches to Qualitative Content Analysis. *Qual Health Res*. 2005;15(9):1277–88.
24. Edwards P. Increasing response rates to postal questionnaires: systematic review. *BMJ*. 2002;324(7347):1183–1183.
25. Zhang W, Doherty M, Peat G, Bierma-Zeinstra MA, Arden NK, Bresnihan B, et al. EULAR evidence-based recommendations for the diagnosis of knee osteoarthritis. *Ann Rheum Dis*. 2010;69(3):483–9.
26. Sherman SL, Gulbrandsen TR, Lewis HA, Gregory MH, Capito NM, Gray AD, et al. Overuse of Magnetic Resonance Imaging in the Diagnosis and Treatment of Moderate to Severe Osteoarthritis. *Iowa Orthop J*. 2018;38:33–7.
27. Goh S-L, Persson MSM, Stocks J, Hou Y, Welton NJ, Lin J, et al. Relative Efficacy of Different Exercises for Pain, Function, Performance and Quality of Life in Knee and Hip Osteoarthritis: Systematic Review and Network Meta-Analysis. *Sports Med Auckl Nz*. 2019;49(5):743–61.
28. Selten EM, Vrieseckolk JE, Geenen R, Laan WH van der, Meulen-Dilling RG van der, Nijhof MW, et al. Reasons for Treatment Choices in Knee and Hip Osteoarthritis: A Qualitative Study. *Arthritis Care Res*. 2016;68(9):1260–7.
29. Egerton T, Diamond LE, Buchbinder R, Bennell KL, Slade SC. A systematic review and evidence synthesis of qualitative studies to identify primary care clinicians' barriers and enablers to the management of osteoarthritis. *Osteoarthritis Cartilage*. 2017. doi: 10.1016/j.joca.2016.12.002.
30. Bunzli S, O'Brien BHealthSci P, Ayton D, Dowsey M, Gunn J, Choong P, et al. Misconceptions and the Acceptance of Evidence-based Nonsurgical Interventions for Knee Osteoarthritis. A Qualitative Study. *Clin Orthop Relat Res*. 2019 Sep;477(9):1975.
31. Bosch M, Weijden TVD, Wensing M, Grol R. Tailoring quality improvement interventions to identified barriers: a multiple case analysis. *J Eval Clin Pract*. 2007;13(2):161–8.
32. Bethlehem J. Selection Bias in Web Surveys. *Int Stat Rev*. 2010;78(2):161–88.
33. Radics R, Sudipta D, Kelley S. Manage sample and population differences by weighting - using SPSS raking algorithm. In 2014.
34. Human Research Act. 2011. <https://www.admin.ch/opc/en/classified-compilation/20061313/index.html>. Accessed 02 Jan 2020.

Figures

Figure 1

Diagnostic measures used after clinical assessment (n=226)

Figure 2

Highest prioritization of reasons for the referral to exercise (n=1)