

# Quality of osteoarthritis care in family medicine – A cross-sectional study

Maja Račić<sup>1</sup>, Milena Tošić<sup>2</sup>, Srdjan Mašić<sup>1</sup>

<sup>1</sup>University of East Sarajevo, Faculty of Medicine, Department for Primary Care and Public Health, Foča, Republic of Srpska, Bosnia and Herzegovina;

<sup>2</sup>Primary Health Centre, Ugljevik, Republic of Srpska, Bosnia and Herzegovina

## SUMMARY

**Introduction** Effective treatments for osteoarthritis are available, yet little is known about the quality of primary care in the Republic of Srpska for this disabling condition.

**Objective** The main objective of this study was to analyze the overall quality of osteoarthritis treatment in a family medicine setting, as well as to explore whether the achievement of quality indicators was associated with particular patient characteristics and severity of osteoarthritis.

**Methods** The cross-sectional study included 120 patients with confirmed hand, knee, and hip osteoarthritis, recruited at seven family practices in the town of Ugljevik, Republic of Srpska, Bosnia and Herzegovina. Data were extracted from a patient questionnaire on quality indicators, as well as from their electronic and paper records, to assess care against 14 indicators. The included quality indicators were based on the Arthritis Foundation's Quality Indicator set for Osteoarthritis. Summary achievement rates for hip, knee, or hand osteoarthritis, as well as for the total sample, were calculated.

**Results** The mean achievement rate for all 14 quality indicators obtained from medical records was 74%, and 77% obtained from patient interview. The quality indicators concerning referral for weight reduction (23%) and pharmacological treatment (24%) had the lowest achievement rates, whereas the highest achievement rates were related to physical examination (100%), pain and functional assessment (100%), and education (90.8%). Patients physical functioning was significantly associated with the quality indicator achievement rate ( $p = 0.001$ ).

**Conclusion** Pharmacological therapy and the referral of osteoarthritis patients in need of weight reduction seem to have the greatest potential for improvement in primary health care.

**Keywords:** osteoarthritis; quality of care; quality indicator; family medicine

## INTRODUCTION

Osteoarthritis (OA) is the most common chronic disorder, which usually results in joint pain and deformity, ultimately leading to chronic disability. Hence, it becomes a significant medical and financial burden in a world with ageing population [1]. Symptoms of OA are often insidious and can be highly variable, depending on the affected joint and the severity and the number of joints affected, with the joint pain as the first and predominant symptom. Other manifestations are self-limited morning stiffness, the crepitus on palpation, tenderness over the affected joint on palpation and frequently reduction in joint range of motion. As the disease progresses, patient gradually experiences progressively severe joint discomfort and increasing difficulty with activities of daily living [1, 2, 3].

OA is a highly prevalent disease, but little attention has previously been paid to the quality of health care delivered for this disease, and to performance in the processes of care. Routine audit and feedback on provided care is needed to improve the quality of that care. Several studies have demonstrated regional and subspecialty variations in the use of pharmacological, non-pharmacological, and surgical treatment modalities in patients with OA [4,

5]. Although systematic measurement of health care quality can lead to improvements in terms of care delivered to patients with OA [6, 7, 8], it is difficult to define what constitutes quality because standard sets of measures to assess quality vary considerably. A systematic review by Edwards et al. [9] identified a range of indicators for OA which have a good evidence base, are consistent with international guidance, and many of which have been implemented previously.

The quality of care is also influenced by patients' declared and real expectations. Patient often express expectations about information and treatment, for instance. Nevertheless, this expectation is variable, not uniformly shared between patients and physicians or during the therapeutic course. This expectation can be less a need for more information than a need for re-assurance and pain control [10].

However, very little is known about the quality of care family physicians provide for this disabling condition.

## OBJECTIVE

The main objective of this study was to analyze the overall quality of OA treatment in a family medicine setting in one town in the Republic

## Correspondence to:

Maja RAČIĆ  
Department for Primary Care and  
Public Health  
Faculty of Medicine  
University of East Sarajevo  
Studentska 5, 73300 Foča  
Republic of Srpska  
Bosnia and Herzegovina  
[maja.racic@ues.rs.ba](mailto:maja.racic@ues.rs.ba)

of Srpska as well as to explore whether the achievement of quality indicators (QIs) was associated with particular patient characteristics and severity of OA.

## METHODS

### Patients

A cross-sectional study included patients with confirmed hand, knee, and hip OA, recruited at seven family practices in the Primary Health Care in Ugljevik, the Republic of Srpska, Bosnia and Herzegovina, with the inclusion period from January 1, 2014 to May 31, 2014.

The sample size for the population of 398 patients with OA included in regional Osteoarthritis Registry, with the confidence interval of 7.67% and confidence level of 95% was calculated to be 116.

Inclusion criteria were age of  $\geq 55$  years, clinical diagnosis of primary hand, hip, and knee OA based on joint pain on most days for at least one month in the previous year (with at least two of the following symptoms: stiffness, crepitus, bony tenderness, and bony enlargement) and radiological diagnosis of OA (joint space narrowing, osteophytes, subchondral cysts, and bony sclerosis). Individuals with any evidence of secondary OA, inflammatory arthritis, and those with neurologic diseases were excluded. The patients were contacted for permission to be included in the study and were asked to give their written informed consent.

The study was conducted in accordance with the World Medical Association Declaration of Helsinki of 1964, with the approval of the Ethical Committee of the Medical Faculty of Foča, University of East Sarajevo.

### Instruments

A standardized questionnaire was used to collect data regarding the patients' characteristics such as gender, age, occupational status, smoking habits, physical activity, body mass index, duration of the disease, and self-reported comorbidities.

Depending on the type of the osteoarthritic joint most affected, questionnaires on physical functioning were chosen as follows: the Knee Injury and Osteoarthritis Outcomes Score (KOOS-PS), the Hip Disability and Osteoarthritis Outcomes Score (HOOS-PS) and the Michigan Hand Outcomes Questionnaire (MHQ). The KOOS-PS is a shortened version of KOOS, developed by Perruccio et al. [11] in 2008, consisting of seven questions about the knee physical functions, scored by summing the responses to the seven items of the KOOS-PS score, with the results interval scored from 0 to 100. The HOOS-PS is the shortened version of HOOS, developed by Davis et al. [12] in 2008 and Bond et al. [13]. It comprises five questions including climbing down the stairs, getting in or out of bath and sitting, running and twisting on loaded leg. Responses

in KOOS-PS and HOOS-PS were graded on a five-point Likert scale. A score from 0 to 100 was determined by crosswalk table of raw scores for each subscale, with 0 representing the best results. The MHQ covers the following six domains: (1) overall hand function, (2) activities of daily living, (3) pain, (4) work performance, (5) aesthetics, and (6) patients' satisfaction with hand function. The last four of these domains are scored for the right and left hand separately. Each item is scored on a 1 to 5 scale, with the domain scores ranging from 0 to 100. If both hands are affected, the left and right hand scale scores are averaged to obtain the score. For every domain, a higher score indicates better hand function, except for the pain domain, where a higher score means more pain. The total score (the average of all domains) ranges from 0 to 100, with a higher score indicating a better hand function [14].

According to the level of the scores, physical function of the joints was classified as normal or with mild, moderate, severe, or very severe impairment.

The patients completed the questionnaire after consultation with a family physician. The questionnaires were administered and handled by the researchers.

The MHQ, KOOS-PS, and HOOS-PS were translated into Serbian and linguistically validated [15]. The internal consistency reliability of the Serbian version of the questionnaires was assessed by Cronbach's alpha coefficient, while their convergent validity was assessed by Spearman's correlation coefficient.

In testing for internal consistency, Cronbach's alphas ranged from 0.78 for the HOOS-PS, 0.82 for the KOOS-PS, to 0.91 for the MHQ (values  $>0.7$  for Cronbach's alpha are considered a good internal consistency). The reliability using Spearman's correlation demonstrated substantial agreement, ranging from 0.86 for the HOOS-PS to 0.94 for the MHQ.

The Serbian versions of the MHQ, KOOS-PS, and HOOS-PS were shown to be reliable and valid tools for assessing of the hand, knee, and hip osteoarthritic joint physical functioning in Serbian-speaking patients.

### Derivation of QIs

In order to assess the quality of care of patients with OA, questionnaires based on the Arthritis Foundation's Quality Indicator set were used [16]. This indicator set covers regular physical examination and assessment of pain and functioning (QI 1–3), the provision of education (QI 4), instructions on exercise and weight management (QI 5–8), assessment of need for assistive devices (QI 9–10), the provision of pharmacological and surgical treatment (QI 11–13), and the provision of radiographs (QI 14). The data were extracted from the patient questionnaire on QI as well as from their electronic and paper records, to assess care against the 14 indicators. All aspects of the electronic medical records were included in the search for evidence of QIs, such as free text. The entire paper record from the date of diagnosis was also included.

**Statistical analysis**

Statistical analyses were carried out using SPSS Statistics for Windows, Version 17.0 (SPSS Inc., Chicago, IL, USA). Means and standard deviations (SD) for continuous variables and frequency and percentage for categorical variables were used to describe the data.

The mean scores of KOOS-PS, HOOS-PS, and MHQ were calculated for the different studied subgroups, and the normality of their distributions was tested by the Kolmogorov–Smirnov test. Differences between patients with hip, knee, and hand OA were analyzed by one-way analysis of variance (ANOVA) and between medians by the Kruskal–Wallis test. P-values less than 0.05 were considered significant.

QI achievement rates were calculated for each QI separately and for the study sample as a whole, in which the numerator represents the number of patients achieving the indicators and the denominator represents the number of eligible persons. Correspondingly, summary achievement rates for each person were calculated as the total number of QIs they passed, divided by the total number of QIs for which they were eligible. Summary achievement rates were calculated using the data obtained from medical records as well as from patients’ interviews. The achievement rates are presented as percentages.

We also analyzed factors for variation in QI achievement rates in bivariate regression analyses, employing the following independent variables: age, gender, occupation, place of living, duration of disease and health-related quality of life measured by the HOOS-PS/HOOS-PS/MHQ scores.

**RESULTS**

The total number of registered patients with hip, knee, and hand OA as recruited from family medicine practices was 127. Five patients were excluded from the study due to the co-presence of rheumatoid arthritis, and two due to secondary OA. For the patients who fulfilled criteria to be included in the study, the response rate was 100%. Demographic characteristics of the patients are presented in Table 1.

All three, knee, hip, and hand OA groups, reported high scores on the KOOS-PS/HOOS-PS/MHQ scales. More than one third (35%) of patients had severely impaired physical functioning. Differences between means of the three groups were not found ( $F = 1.992$ ;  $p = 0.920$ ) (Table 2).

The Kruskal–Wallis one-way analysis of variance showed that housewives and farmers had more severe functional impairments compared to the respondents with other occupations ( $H = 20.868$ ;  $p < 0.001$ ). The respondents with longer duration of the disease had more problems with physical functioning ( $H = 14.847$ ;  $p = 0.011$ ). A statistically significant difference in terms of severity of functional impairments was found in relation to the value of body mass index ( $H = 4.005$ ,  $p = 0.009$ ). Obese patients had more severe OA, not only in the hips and the knees, but also in non-weight bearing joints, hands (Table 3).

There were large variations in terms of achievement rates for different QI items (Table 4). The mean QI

**Table 1.** Patients’ characteristics (n = 120)

Characteristic	n	%	
Gender	Female	83	69.0
	Male	37	31.0
Occupation	Farmer	24	20.0
	Housewife	47	39.0
	Age retiree	10	8.0
	Blue collar jobs	22	18.0
	White collar jobs	17	15.0
Place of living	Town	45	37.5
	Rural region	75	62.5
Smoking	Yes	21	17.5
	No	99	82.5
Physical activity	Yes	16	13.0
	No	104	87.0
Localization	Hip	29	24.0
	Knee	56	47.0
	Hands	35	29.0
Comorbidity*	Other chronic disease	97	81.0
	None	23	19.0
Time since diagnosis (year)	<1	8	6.7
	1–3	38	32.0
	4–6	36	30.0
	7–10	22	18.0
	>10	16	13.3

\*Hypertension, diabetes mellitus, asthma, chronic obstructive pulmonary disease

**Table 2.** Distribution of joints affected according to intensity of impairment in physical functioning (KOOS-PS/HOOS-PS/MHQ score)

Impairment in physical function	Joint affected					
	Hands		Knee		Hips	
	n	%	n	%	n	%
Mild	5	14.70	7	12.50	4	13.16
Moderate	10	29.40	14	25.00	7	23.68
Severe	12	32.40	20	35.42	11	36.84
Very severe	8	23.50	15	27.08	7	25.32
Total	35	100	56	100	29	100

achievement rate for all 14 QIs obtained from medical records was 74%, and 77% obtained from patient interview. Quality measures using patient interview almost mirrored medical record findings. The QI concerning referral for weight reduction (QI 8) had the lowest level achievement rate, with 23% of the self-reported overweighted persons being referred to weight loss program. The achievement rates for pharmacological treatment (QIs 11 and 12) were 40.4% and 24%, respectively. Although only 13% of the respondents reported being physically active, the achievement rate for receiving information about the importance of physical activity and exercise was 78%.

The results of bivariate regression analysis show that patient physical functioning is significantly associated with QI summary achievement rate ( $p = 0.001$ ), with non-standardized  $B = 5.9$  (95% CI 2.3–8.7). Patients with higher scores on HOOS-PS/KOOS-PS and MHQ questionnaires had higher achievement rates. Age, gender, occupation, place of residence, and duration of the disease were not associated with the QI achievement rate.

**Table 3.** Distribution of severity of functional impairments according to body mass index (BMI) value, smoking status, physical activity, duration of the disease, and occupation

Characteristic		Mild	Moderate	Severe	Very severe	H*	p
BMI	19–24.9	5	6	4	0	4.005	0.009
	25–29.9	8	21	10	8		
	>30	3	4	28	23		
Smoking	Yes	3	10	12	13	2.935	0.402
	No	13	21	30	18		
Physical activity	Yes	2	6	4	4	1.458	0.482
	No	14	25	38	27		
Duration of the disease (years)	<1	4	1	2	1	20.868	<0.001
	1–3	4	15	17	2		
	4–6	4	9	14	9		
	7–10	4	3	4	11		
	>10	0	2	6	8		
Occupation	Farmer	2	6	7	9	14.847	0.011
	Housewife	4	9	15	19		
	Age retiree	4	1	4	1		
	Blue collar jobs	5	8	9	0		
	White collar jobs	3	7	6	1		

\*Kruskal–Wallis test

**Table 4.** Achievement rate of quality indicators (QI)

QI [16]		Number of patients eligible	Achievement rate in medical records (%)	Achievement rate in patient interview (%)
Physical examination	1	120	100.0	100.0
Pain and functional assessment	2	120	100.0	100.0
	3	120	100.0	100.0
Education	4	120	90.8	100.0
Exercise	5	120	78.0	78.0
Weight loss	6	85	84.7	86.0
	7	85	84.7	86.0
	8	71	23.0	23.0
Assistive devices	9	97	83.0	83.0
	10	104	90.4	92.0
Pharmacologic therapy	11	47	40.4	42.0
	12	30	24.0	26.0
Surgery	13	54	75.9	78.0
Radiographs	14	73	79.0	79.0
Mean QI achievement rate			74.0	77.0

## DISCUSSION

This study used 14 indicators to measure the quality of primary care for OA, and the data on quality were obtained using patient interview and medical records. We found that the mean QI achievement rate was 74%, which is higher than the findings in other studies [17, 18, 19]. The achievement rates or pharmacological treatment was lower than in the other studies [19]. Around 40% of eligible patients used acetaminophen as the first drug choice to treat the OA pain. Data available from both medical records and patient interview showed that only 24% of patients had a trial of maximum acetaminophen dosage before switching to a different oral analgesic. Since the treatment of OA pain is such a common clinical problem, it seems an obvious area in which evidence-based treatment decisions should be directed towards the implementation of the existing guidelines or used to build stronger clinical guidelines. On the other hand, patients

have to play central roles in determining their own care and have different preferences when choosing treatment. This may vary across cultural and ethnic backgrounds, relating to beliefs about healthcare in general and treatment in particular. Frequently, OA patients have preferences for complementary therapy, alternative medicine or invasive treatments such as injections [20]. Adherence is another barrier to treatment success. It is suggested that adherence to any intervention in OA is between 50% and 95%, but as these estimates are mainly derived from clinical trials, the real levels in clinical practice are likely to be much lower.

The finding that the referral for weight reduction had the lowest pass rate is in accordance with other studies [18]. The fact that only 23% of those who were overweight had been referred to weight reduction counseling might simply reflect that the majority of the respondents came from rural settings where community-based service for overweight people is not available. On the other hand, the high achievement rate for QI on exercise might reflect that



81% of the respondents had at least one chronic disease other than OA, such as hypertension or diabetes, and that there are many similarities between recommendation for non-pharmacological treatment of comorbidities and OA.

Bivariate regression analysis showed that the patient's physical functioning was significantly associated with the QI summary achievement rate. The effects of OA severity or the severity of functional impairment on the achievement rate might be explained by aspects of the condition and of the service, such as the age-related nature of OA and the likelihood of patients with a more severe condition consulting more often.

Although bivariate regression analysis did not show any significant association between occupation, body mass index, or duration of the disease and severity of functional impairments, the Kruskal-Wallis test showed that obese patients, farmers, and housewives, as well as patients with longer duration of the disease, had more severe impairments or worse score on the HOOS-PS/KOOS-PS/MQH questionnaires compared to the other respondents, indicating that these groups should be given special attention [18, 19].

Other authors have also assessed the quality of the OA treatment using different QI sets than what we used in the present study. For example, Askari et al. [21] reviewed the use of the ACOVE QIs in 17 studies and found that the interquartile range score of 29–41% for OA was the lowest score among the diseases reviewed [22], while Li et al. [23] reported the achievement rate on four QIs to be 22%. Although the QI achievement rate in the present study was higher, it is difficult to make a comparison because the study samples, settings and methods differ. However, large variations in achievement rates for different QI items point out that there is substantial room for improvement of OA care in the town of Ugljevik and that more attention should be paid to the education of family physicians in the field of rheumatology, such as OA management, as well as to the improvement of collaboration with rheumatologists. Future research and efforts for improving OA care should be directed towards the development and implementation of clinical guidelines for OA care.

The strength of this study is that the data on QI achievement rate were obtained from patients and had been validated against medical records, making it possible to assess the care received and perceived. The study sample was not subjected to selection bias related to the family physicians recruiting participants. The indicators refer to health care processes rather than outcomes, and as such may be more

sensitive measures of quality, and are more clearly linked to further quality improvement actions. As the burden of OA is high, much of it is presented clinically to family physicians, the incorporation of the set of QIs at national and international level in the realm of routine primary care practice is therefore recommended. Interventions are to be designed to improve achievement of these indicators. Furthermore, it is necessary to define and analyze the boundaries of responsibility for care in the context of the physician-patient relationship and identify specific elements, such as providing adapted and formalized information to patients, adopting more comprehensive assessment and therapeutic approaches, dealing more with patients' views, ideas, and expectations, that are to be preserved in order to maximize patient outcomes without compromising the quality of care for patients with OA.

The present study has several limitations. The QI achievement rate may be overestimating the quality of OA care due to the characteristics of the participants, such as poor socioeconomic backgrounds, as well as the intensity of OA. The included indicators encompass only a small proportion of care, and it is important to note that QIs cannot represent the full spectrum of patient-centered care. Also, the study did not analyze physicians' views on the quality of care and implementation of guidelines.

## CONCLUSION

The quality of care for patients with OA in our study was suboptimal. The summary achievement of QIs was significantly associated with patient physical functioning. Pharmacological therapy and the referral of patients with OA in need of weight reduction seem to have the greatest potential for improvement. Continuous evaluation and implementation of improvement strategies are required. More attention should be paid to patients' views and expectations to increase quality of care and treatment adherence. The future studies need to determine the quality of care for patients in the whole region of the Republic of Srpska.

## ACKNOWLEDGEMENTS

The authors are grateful to Dr. Ljiljana Vučković-Dekić for critically reviewing the manuscript.

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## Квалитет лечења остеоартритиса у породичној медицини – студија пресека

Маја Рачић<sup>1</sup>, Милена Тошић<sup>2</sup>, Срђан Машић<sup>1</sup>

<sup>1</sup>Универзитет у Источном Сарајеву, Медицински факултет, Катедра за примарну здравствену заштиту и јавно здравље, Фоча, Република Српска, Босна и Херцеговина;

<sup>2</sup>Дом здравља, Угљевик, Република Српска, Босна и Херцеговина

### КРАТАК САДРЖАЈ

**Увод** Ефективни третмани за остеоартритис су на располагању, али мало се зна о квалитету бриге за ово стање у примарној здравственој заштити Републике Српске.

**Циљ рада** Главни циљ истраживања је анализирати квалитет третмана остеоартритиса у породичној медицини, као и испитати да ли је постизање индикатора квалитета повезано са одређеним карактеристикама болесника и тежином остеоартритиса.

**Методе рада** Студија пресека је обухватила 120 болесника са дијагностификованим остеоартритисом шака, колена и кукова, регистрованим у седам тимова породичне медицине у Угљевуку. Подаци за процену неге кроз 14 индикатора квалитета су прикупљени анкетањем пацијената и из њихових здравствених картона. Избор индикатора је заснован на сету индикатора квалитета Фондације за артритис (*The Arthritis Foundation's Quality Indicator set for Osteoarthritis*). Сто-

пе остварења су израчунате за остеоартритис кука, колена или шаке, као и за укупни узорак.

**Резултати** Средња стопа остварења за свих 14 индикатора квалитета добијених из медицинске документације износила је 74% и 77% добијених анкетањем пацијента. Најниже стопе су постигнуте у погледу упућивања на саветовање ради смањења тежине (23%) и фармаколошког третмана (24%), док су се највише стопе односиле на физикални преглед (100%), бол и функционалну процену (100%), те образовање (90,8%). Физичко функционисање пацијента је било значајно повезано са стопом остварења индикатора ( $p = 0,001$ ).

**Закључак** У примарној здравственој заштити треба побољшати фармаколошки третман остеоартритиса, као и повећати усмеравање пацијената са повећаном телесном тежином на њену редукцију.

**Кључне речи:** остеоартритис; квалитет неге; индикатор квалитета; породична медицина

Примљен • Received: 16/11/2015

Ревизија • Revision: 17/02/2016

Прихваћен • Accepted: 08/03/2016