A patients’ view of OA: the Global Osteoarthritis Patient Perception Survey (GOAPPS)

Marianna Vitaloni (mvitaloni@oafoundation.com)
Osteoarthritis Foundation International  https://orcid.org/0000-0002-4250-3525

Angie Botto-van Bemden
Arthritis Foundation

Rosa Sciortino
Universidad de Los Andes Facultad de Medicina

Xavier Camé
Hospital Clinic de Barcelona

Maritza Quintero
Universidad de los Andes Facultad de Medicina

Pedro Santos-Moreno
Biomab

Rolando Espinosa
Instituto Nacional de Rehabilitacion Luis Guillermo Ibarra Ibarra

Oscar Rillo
Hospital General de Agudos Dr Ignacio Pirovano

Jordi Monfort
Consorti Parc de Salut MAR de Barcelona

Francisco de Abajo
Universidad de Alcala de Henares

Elisabeth Oswald
Osteoarthritis Foundation International

Marco Matucci
Universita degli Studi di Firenze

Patrick du Souich
Universite de Montreal

Ingrid Möller
Universitat Autonoma de Barcelona

Monserrat Romera Baures
Hospital Universitari de Bellvitge

Arlene Vinci
Arthritis Foundation

Deborah Scotton
Research article

**Keywords:** Quality of life, patient perception, osteoarthritis, global survey, patient organizations

**Posted Date:** March 30th, 2020

**DOI:** https://doi.org/10.21203/rs.3.rs-19845/v1

**License:** 😊 This work is licensed under a Creative Commons Attribution 4.0 International License.

Read Full License

**Version of Record:** A version of this preprint was published on November 7th, 2020. See the published version at https://doi.org/10.1186/s12891-020-03741-0.
Abstract

Background Globally, osteoarthritis (OA) is the third condition associated with disability. There is still poor treatment in OA but science holds the key to finding better treatments and a cure. It is essential to learn what's important to patients from them to implement the most effective OA management. The OA Patients Task Force, conducted the Global OA Patient Perception Survey (GOAPPS)-the first global survey to compare the quality of life (QoL) & patient perceptions of care across countries. The goal was to collect data on OA patients' perception of OA to understand patients' needs and expectations to improve OA management.

Methods Observational, cross-sectional study by online survey data collection into three languages. Patient demographics, symptomology, OA impact on daily activity and QoL data were collected. The questionnaire comprised of 4 sections: clinical characteristics, relationship with physicians, perception of attention, treatment, information, and QoL.

Results A total of 1512 surveys were filled in 7 countries. 84.2% of respondents reported pain/tenderness and 91.1% experienced limitations to physical activities. 42.3% of patients were not satisfied with their current OA treatment. 86% had comorbidities, especially hypertension, and obesity. 51.3% and 78% would like access to additional drug or additional non-drug/non-surgical treatments respectively. 51.7% considered their QoL satisfactory.

Conclusions OA has a significant impact on patients' daily activities and the desire to play an active role in managing their disease. Patients seek additional treatments stressing the need for investing in clinical research, implementing OA preventive measures and managing interventions to improve the healthcare value chain in OA.

Background

Globally, osteoarthritis (OA) is the third most rapidly rising condition associated with pain and disability and quality-adjusted life-year losses. [1, 2] It is the most common musculoskeletal disorder. [3, 4] Worldwide, around 300 million people suffer from OA, of these, more than 40 million adults live in Europe, over 30 million in the United States while in LatinAmerica these data are just partially available.[1, 5, 6] OA associates with different degrees of disability, ranging from mild and intermittent pain with minimal difficulty in performing daily activities, to chronic pain, progressive structural damage and loss of function, often associated with a decrease in mental health and an increase in mortality when a person can no longer walk or live independently.[1]

Lately, there is increasing interest in interventions that target OA in order to improve physical health, quality of life (QoL), reduce opioid or NSAID abuse and associated comorbidities. To create and implement this kind of initiatives a consensus about the outcomes that are relevant to OA patients, comorbid populations and other key stakeholders in OA needs to be created listening to their opinions and experiences. Learning what is important to patients from the patients themselves is essential to
create a core outcome set, including outcomes across conditions, urgently required to bridge the gap between the patients’ needs and the current OA management paradigms.

Integrated people-centered health services, as defined by the World Health Organization, implies putting the comprehensive needs of people and communities, not only the conditions as such, at the center of health systems, and empowering people to have a more active role in their own health. [7] To support OA patients, the Osteoarthritis Foundation International (Barcelona, Spain) and the Arthritis Foundation (Atlanta, United States) with participation from the most important organizations fighting against rheumatic disease worldwide such as the Panamerica League against Rheumatism (PANLAR) created the OA Patients Task Force; global alliance representing about 150 million patients and working together in the fight against OA.

In 2018 OA Patients Task Force entitled to the Global OA Patient Perception Survey (GOAPPS). The first survey to investigate the OA patients’ perception of QoL directly comparing it across many languages and nations/cultures using the same survey. The purpose was to conduct a pilot study to collect information on OA patients’ perceptions regarding the impact of the disease in their lives. The survey results aim to help all stakeholders involved in the OA healthcare and management value chain to develop a better understanding of patients’ perceptions and how they may differ between cultures in order to address their needs more effectively in terms of prevention, research, and management.[8]

**Methods**

This is an observational, cross-sectional study involving data collection through an online survey in 7 countries: Colombia, España, Italia, Mexico, United States Venezuela.

In order for participants to be included in the study, they must have been residents of one of the participant countries, being older than 18 years and reporting to have been diagnosed with OA by their physician.

*Questionnaire development*

The questionnaire was developed by the International OA Task Force group of experts composed by rheumatologists, clinical pharmacologists, epidemiologists and, patient advocacy specialists.

This first version of the questionnaire in English was translated into Spanish and Italian using a specific protocol of forward translation, back translation, and resolution. The translation process was supervised by the Survey coordinator designed in each region.

During forward translation, a health professional familiar with relevant terminology, fluent in English but whose mother tongue is the primary language of the target culture, translated the survey from English to the local language. The focus was on conceptual rather than literal translation and the use of natural and acceptable language for the broadest audience. During back translation, a different translator, a native
English speaker, who had no knowledge of the questionnaire, translated the survey from the local language to English.

The forward translator, back translator, and Survey Coordinator met to resolve any concerns or discrepancies in the forward translated language. The Survey Coordinator sent the translation documentation to international project coordinators to ensure coordination of survey language across participating countries.

The final questionnaire was divided into 3 sections with a first window consisting of an information statement and a statement saying “By entering the survey, I indicate that I have read the information provided and agree to participate.” The first included questions to measure the demographics and clinical characteristics of the patients. The second focused on the relationship with physicians and explored the personal perception of attention, treatment, and information received. In the last section, patients were asked to evaluate their QoL. Finally, two questions were added to explore the patients’interest in the survey results and their willingness to participate in a future survey on OA.

The OAFI Patients Committee evaluated the ethical aspects of the final version of the questionnaire. The members of the committee, fifteen volunteers OA patients, approved the questionnaire compliant with patient use.

Survey

The engagement with patients occurred in two stages: 1) a pilot test and 2) the online administration.

During the pilot test, the local Survey Coordinators administrate the questionnaire to 10 volunteer patients fulfilling the inclusion criteria to evaluate the questionnaire burden and acceptability and comprehensibility. As a result, some questions were modified to avoid unfamiliar terms or removed to shorten or avoid repetition. (Additional file 1).

The final survey was administered by the Arthritis Foundation using the online secured Qualtrics platform from June to November 2018, a survey software allowing to conduce personalized surveys. The local Survey Coordinator administrated the survey in each country through collaboration with local organizations by promoting access to the survey webpage using social media promotions and brochures or other promotional materials.

Using the Limited Data Set, the OA Patients Task Force used descriptive statistics to characterize the patients’ responses.

The survey results were analyzed by means of descriptive statistics to characterize the patients’ answers using the IBM SPSS® software.

Results
Patients' demographic and clinical data

A total of 1683 patients entered the online survey. 1512 entries were considered correctly completed. The final sample includes patients from USA, Spain, Colombia, Venezuela, Mexico, Italy. The demographic data of patients surveyed are shown in Table 1.

Table 1. Demographic data of patients surveyed

|                              | %    | No   |
|------------------------------|------|------|
| Questionnaires completed     |      | 1512 |
| Sex                          |      |      |
| Male                         | 14.5%| 219  |
| Female                       | 85.5%| 1293 |
| Total                        | 100% | 1512 |
| Age                          |      |      |
| 18 - 39                      | 1.7% | 25   |
| 40 - 59                      | 26.3%| 397  |
| 60 - 79                      | 65.5%| 991  |
| >80                          | 6.5% | 98   |
| N/A                          | 0.1% | 2    |
| Total                        | 100% | 1512 |
| Primary country of origin    |      |      |
| United states                | 82.2%| 1243 |
| Venezuela                    | 11.4%| 172  |
| Spain                        | 4.0% | 60   |
| Colombia                     | 1.9% | 29   |
| Mexico                       | 0.4% | 6    |
| Italy                        | 0.1% | 2    |
| TOTAL                        | 100% | 1512 |

When patients were asked in which joints were diagnosed with OA, the majority declared to have it in the knee, followed by hand, spine, and hip (Figure 1). Also, 435 of respondents reported having OA in other joints, mainly feet, shoulder and ankle (Additional file 2).

Regarding comorbidities, 86% of respondents reported being diagnosed by one or more comorbidities. In particular, 27.3% reported having one comorbidity, while 24.6% and 16.5% reported having two and three comorbidities respectively. Arterial hypertension and obesity were the most commons ones. Obesity was reported as the first comorbidity in the United States, Spain, Mexico, and Colombia, while hypertension was the first comorbidity in Venezuela (data not shown). Gastrointestinal problems were the third most reported comorbidity. Osteoporosis was associated with OA in 22.6% of patients. Depression and anxiety had a high prevalence, being reported by 25.6% and 20.6% of respondents. Furthermore, 12.4% of OA patients suffered from diabetes. (Figure 2).

Regarding OA symptoms, patients could select up to three options. The combination of pain/tenderness, stiffness and gait/walk disturbance was the commonest symptom reported that most significantly impacted their daily life. 84.2% of patients declared suffering for pain/tenderness, 48.9% for stiffness and 37.7% of gait/walk disturbance. Also, loss of flexibility, sleep disturbance, fatigue, and swelling were reported as high prevalence symptoms in OA patients (Figure 3).

Regarding the limitations experienced due to OA, 91.1% of the patients reported limitations in their everyday life physical activities, followed by 49.1% of patients reporting limitations to their work activities, and 37% in social interactions. OA has emotional, psychological, or mental health consequences in almost one-third of respondents and limited their sex life in 24.9% of patients. (Figure 4; Additional file 3).

Patients self-reported relationship with physicians and perception of attention, treatment, and information received
When participants were asked if their doctors “understand” them when they describe their OA symptoms, 70.8% agreed or strongly agreed, while 13% disagreed or strongly disagree with the statement. When asked if their doctor adequately explained their OA diagnosis and what it represented to them, 58.3% agreed or strongly agreed and 22.1% disagreed or strongly disagreed. 53.3% of participants stated that they understood their OA treatment options and the associated risks, while 24.6% did not. Finally, 26.8% strongly agreed or agreed to be satisfied with their current OA treatment, while 42.3% disagreed or strongly disagreed (Additional file 4).

Regarding the possibility of access to additional treatment, 51.3% stated they would like to have access to additional drug treatment options for their OA, while 18.9% were not interested. When asked about the possibility to have access to additional surgical treatment the respondents, the 36% were not interested while the 35% were. Finally, 78% of the participants would like to have access to additional non-drug/non-surgical treatments for their OA.

**Patients' perception of QoL.**

In the last part of the questionnaire, when asked about their QoL, half of the patients (51.7%) reported being satisfied while the other half was not satisfied or not sure to be satisfied with their QoL (48.2%). When asked about how would their QoL be if their OA signs and symptoms were eliminated, 94.2% of respondents said that their quality of life would be good or very good, meaning that 42.5% of respondents think OA affects their QoL and its elimination could improve it.

Finally, 74% of patients said that they would like to be informed about the results of this study and 79% would like to participate in future research on OA.

**Discussion**

OA is one of the most prevalent diseases affecting people globally and being a leading cause of pain and disability among adults [9, 10]. Lately, evidence-based reports emphasize that adequate management of OA requires a combination of behavioral and medical strategies. [11, 12] Thus there is an increasing interest in interventions that target OA to improve QoL, physical health, cognitive-behavioral approaches to pain management and to reduce opioid or NSAID abuse and comorbidities.

To ensure effective design and implementation of these interventions it is necessary to know which outcomes are relevant for patients to ensure their participation and satisfaction. Empowering patients to have a more active role in their own health and engage them in research are key aspects of the improvement of health services and the current OA management strategies. Patients should be considered as another stakeholder within the health system and patients’ organizations should be considered as another healthcare agent, present in real decision making, to make patient voice heard.

The OA Patients Task Force, an alliance of patient organizations working together to raise awareness on OA and improve QoL of patients, designed and executed the GOAPPS survey. This is a pilot study aiming
to collect and analyze data on OA patient perceptions regarding their health conditions, OA care, necessities and to explore the impact of OA on daily functioning and QoL. The results aim at providing a portrait of patients' perceptions of OA to provide a baseline to take better quality performance in the future.

The majority of respondents to the GOAPPS were women, this reflects the gender characteristic of OA which is more prevalent among women. [13–16] This can also be interpreted as women being more active and willing to participate in these types of surveys. Our study included individuals 18+, the minimum age reported was 25, although in lower proportions as have also been reported in other studies. [1] The range of age with a higher prevalence of OA was 65 to 74 years. Of interest, almost a third of participants were 40 to 59 years indicating that OA also affects younger groups of people like pre-menopausal women, athletes or injured people.[17]

Also, the majority of the respondents were from the USA. This could be a consequence of the different computer literacy existing among the different countries that participated in the survey. The data could also reflect the importance and strength that patient organizations have in each country which can associate with the structure of national health systems. Knee OA has been the joint with the highest prevalence, as has been reported in other studies. Also, hand, spine, foot, and shoulder (by this order) were identified as other joints most affected by OA.

The majority of patients reported having one or more conditions, the most prevalent one was arterial hypertension. A recent meta-analysis revealed increased risks of myocardial infarction and stroke among OA patients compared to healthy controls and significantly increased markers of subclinical atherosclerosis. [18] Also, obesity affected more than one-third of respondents in line with previous studies where obesity was described as an important modifiable risk factor associated with OA. [19–21]

A high prevalence of gastrointestinal problems has also been reported. We can speculate that it can be due to the adverse effects related to the use of NSAIDs, which remain the oral treatment of choice in the majority of the cases[22]. The results related to mental health showed that almost half of the respondents reported depression and/or anxiety problems. Globally, musculoskeletal diseases and mental disorders are the leading causes of disability, and they have been reported to have a mutual relationship. [23] OA can increase the risk of social isolation, cognitive impairment, and depression. [24, 25] Also, patients with hip OA have been reported to be severely depressed preoperatively due to pain and limited daily-living activities. [26]

OA limits several aspects of the patients' life, affecting their QoL. Almost all patients reported limitations in physical and work activities, informing also of enormous limitations in their personal life. OA has been reported as a leading cause of chronic pain and disability in older adults in different studies. [1, 27–29] In our survey, the limitations reported by respondents are associated with severe symptomatology, especially, pain, stiffness, loss of flexibility among others.
According to our findings, patients reported understanding the common causes of OA and that their doctor adequately explained their OA diagnosis to them. This is in line with the results found by Baumann et al [30], in which OA patients considered that the advice and support obtained from their doctors were good. However, only 26.8% of respondents said to be satisfied with their current treatment plan, showing that there is still room for improvement in treatment and management for OA.

A pharmacological approach has been commonly used in OA. Still more than half of the respondents would like to have access to additional drug treatments, a request which underlines the urgent need for new medications for OA treatment. Currently, there is no cure for OA, pharmacological treatments can help to relieve symptoms but often they cannot be used for a long period of time due to adverse effects and are incompatible with medications used for OA-associated comorbidities. [18, 31–34] Furthermore, it has been previously reported that OA patients are concerned about possible side effects of medication. [35] This evidence, in association with our results, highlight the need for investment in research for new and more active OA pharmacological treatments.

Regarding additional non-drug/non-surgical treatments for their OA, 78% of respondents would like to have access to them. Non-pharmacological therapies such as physical activity or nutritional programs have been recommended in clinical guidelines and reported to have a positive effect on the health status and QoL of OA patients. [36, 37] Also, exercise therapy may postpone total joint replacement. [38] Additionally, self-management programs have shown to improve mental health and social connectedness by ameliorating QoL in OA patients. [21, 39, 40] These results are extremely important for all practitioners to focus their consultation and provide other options to patients, changing the traditional approach to a more holistic one that could improve patients’ QoL.

Pain and other OA-related symptoms can be reduced by rehabilitation programs focused on alleviating pain and maintaining or improving physical and psychological function. Rehabilitation is widely recommended as first-line treatment for OA in evidence-based clinical guidelines [39, 41, 42], as it is safer and, in many cases, more effective at reducing pain than the best established pharmacological interventions. Also, regular exercise is considered to be a core treatment for OA and it is universally recommended amongst treatment guidelines for all individuals with OA. [43, 44].

Despite that 51.7% of patients reported having a good quality of life, 48.2% are either not satisfied with their quality of life or not sure to be. Considering the age of our sample it has to be remarked that elderly people can have, in general, lower expectations in terms of QoL than young patients. [45] Furthermore, often OA is wrongly conceived as a natural condition aging-related, this false myth may lower the expectation of QoL of OA patients while highlighting the need for patients’ educational programs which may have an impact on OA patients’ perception. Anyway, when patients were asked how they would evaluate their QoL if OA was eliminated, almost 95% of respondents said they would be satisfied. This means that there is a 45% of patients who perceive their QoL to be affected by OA. This data once more demonstrate the impact of OA on the QoL of people affected by this disease and the urgent need for OA management strategies improvement.
Limitations of the study

The results of this pilot study present limitations to acknowledge. The data used in the analyses are based on patient self-report, without clinical verification of an OA diagnosis, and thus are subject to the biases that are inherent to this type of data survey. Also, online questionnaires can be associated with gender and age-related biases, as women are more prompt in using this kind of technology while elderly people may find difficulties to respond to them. This study aimed to be an international comparative survey to detect and analyze the differences across country in the perception of OA. There is a huge difference in the number of surveys collected in each of the participant countries. Caution should be taken when interpreting these findings, as there is a clear predominance of surveys answered by patients from the United States.

Conclusion

The results of this pilot study represent an important stepping stone to gain insight into the necessities and priorities of OA patients to shape the health care process on the patient's view. The results highlight the severe impact of OA on patients' life due to associated limitations, symptoms and comorbidities. Also, patients are requesting more pharmacological treatments as an alternative to the symptomatological drugs currently available on the market which can only alleviate OA symptoms and associate with several secondary effects. Importantly, the vast majority of patients are willing to have access to non-drug/non-surgical treatment. Health promotion and self-management strategies addressing unhealthy weight and low levels of physical activity may improve the health conditions of patients as well as educational programs incorporating the patient expert role. This portrait of patients' perceptions of OA can provide a baseline to take better quality performance in the future. Further surveys able to reach a larger population and deciphering socioeconomic characteristics are needed to perform population distribution analyses and understand the specific needs and characteristics of different demographic and social groups. Furthermore, depth research on the reasons behind the patients' needs may contribute to the design of personalized strategies for OA management and treatment.

Abbreviations

GOAPPS Global OA Patient Perception Survey

NSAIDs NonSteroidal Anti-Inflammatory Drugs

OA Osteoarthritis

PANLAR Panamerica League against Rheumatism

QoL Quality of Life

Declarations
ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was approved by the patients’ ethics committee of the Osteoarthritis Foundation International. The patients’ ethics committee formally approved the survey and the study stating that they believe this research could be an instrument to raise awareness on OA patients’ conditions and needs and they did not consider it could cause no harm to patients.

The consent to participate was provided by respondents before taking the survey. The first window of the on-line survey consisted of an information statement and a statement saying “By entering the survey, I indicate that I have read the information provided and agree to participate.”

CONSENT FOR PUBLICATION

Not applicable

AVAILABILITY OF DATA AND MATERIAL

Not applicable

COMPETING INTERESTS

Ingri Möller is a member of the editorial board of the journal.

FUNDING

The authors did not receive any funding for the volunteer research work which produced the submitted manuscript.

AUTHORS’ CONTRIBUTIONS

All the authors contributed to the study conception and design. XC, MQ, PSM, RE, OR, JM, FdA, EO, MM, IM, MRB, MB, PdS, GE, JV designed the initial questionnaire. MQ, EO, MM, MB, JV prepared the final versión of the questionnaire. MV, MB, AB-vB, MQ, PSM, RE, OR and MM were the local Survey Coordinators. AV and DS organized online results. MV analyzed the data. MV, AB-vB, RS wrote the first draft of the manuscript. MV prepared the figures and tables. All authors read and comment on the first draft of the manuscript. MV, PdS, XC prepared the final version of the manuscript. All authors read and approved the final version of the manuscript.

ACKNOWLEDGMENT.

We thank all the patients who participated in the survey and the institutions supporting its diffusion.

Additional Files
Global Osteoarthritis Patient Perception Survey (GOAPPS) questionnaire

English version

Figure showing the joints reported by participants in the category “other”. Patients had the possibility to report OA in joints other than the options offered as an answer (knee, hip, spine, hand). Each column represents the localization(s) of OA as diagnosed by their medical doctor.

Table reporting the limitations experienced due by OA as reported

Table showing participants’ responses to questions related to the causes of OA and their relationship with their doctor

References

1. OARSI. Osteoarthritis: A Serious Disease, Submitted to the U.S. Food and Drug Administration. 2016.
2. Hunter DJ, Schofield D, Callander E. The individual and socioeconomic impact of osteoarthritis. Nat Rev Rheumatol. 2014;10:437–41.
3. Zhang Y, Jordan J. Epidemiology of Osteoarthritis. Clin Geriatr Med. 2010;26:355–69.
4. Valdes AM, Stocks J. Osteoarthritis and Ageing. Emj Eur Med J. 2018; March:116–23.
5. Rigñack Ramírez L, Brizuela Arias LA, Reyes Llerena Gil A, Toledano Zoila M, Hernández Cuellar IM. Estudio preliminar de pacientes con diagnóstico de osteoartritis en servicio de atención ambulatoria del Centro de Reumatología. Rev Cuba Reumatol. 2013;79:192–9.
6. EULAR study group on OA From clinical problems to pathophysiological research goals. Osteoarthritis Research Agenda From clinical problems to pathophysiological research goals. 2015.
7. World Health Organization. What are integrated people-centred health services? 2016. https://www.who.int/servicedeliverysafety/areas/people-centred-care/ipchs-what/en/.
8. Botto-van Bemden A, Eakin G, Sciortino R, Quintero M, Monfort J, Carné X, et al. The global osteoarthritis patient perception survey (GOAPPS): a pilot study. Osteoarthr Cartil. 2019;27:S228–9.
9. Lawrence RC, Felson DT, Helmick CG, Arnold LM, Choi H, Deyo RA, et al. Estimates of the prevalence of arthritis and other rheumatic conditions in the United States. Part II. Arthritis Rheum. 2008.
10. Center for Disease Control and Prevention. Centers for Disease Control and Prevention: Prevalence of doctor-diagnosed arthritis and arthritis-attributable activity limitation.

11. 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.

12. Zhang W, Nuki G, Moskowitz RW, Abramson S, Altman RD, Arden NK, et al. OARSI recommendations for the management of hip and knee osteoarthritis. Part III: Changes in evidence following systematic cumulative update of research published through January 2009. Osteoarthr Cartil. 2010.

13. Plotnikoff R, Karunamuni N, Lytvyak E, Penfold C, Schopflocher D, Imayama I, et al. Osteoarthritis prevalence and modifiable factors: a population study. BMC Public Health. 2015.

14. Litwic A, Edwards MH, Dennison EM, Cooper C. Epidemiology and burden of osteoarthritis. Br Med Bull. 2013.

15. Chaganti RK, Lane NE. Risk factors for incident osteoarthritis of the hip and knee. Current Reviews in Musculoskeletal Medicine. 2011.

16. Srikanth VK, Fryer JL, Zhai G, Winzenberg TM, Hosmer D, Jones G. A meta-analysis of sex differences prevalence, incidence and severity of osteoarthritis. Osteoarthr Cartil. 2005.

17. Heidari B. Knee osteoarthritis prevalence, risk factors, pathogenesis and features: Part I. Casp J Intern Med. 2011.

18. Mathieu S, Couderc M, Tournadre A, Soubrier M. Cardiovascular profile in osteoarthritis: a meta-analysis of cardiovascular events and risk factors. Jt Bone Spine. 2019. doi:10.1016/j.jbspin.2019.06.013.

19. Blagojevic M, Jinks C, Jeffery A, Jordan KP. Risk factors for onset of osteoarthritis of the knee in older adults: a systematic review and meta-analysis. Osteoarthr Cartil. 2010.

20. Kulkarni K, Karssiens T, Kumar V, Pandit H. Obesity and osteoarthritis. Maturitas. 2016.

21. Vitaloni M, Botto-van Bemden A, Sciotino R, Scotton D, Bibas M, Quintero M, et al. Global oa management begins with quality of life assessment in knee oa patients: a systematic review. BMC Musculoskelet Disord. 2019;20:493.

22. Hunter DJ, Bierma-Zeinstra S. Osteoarthritis. Lancet. 2019;393:1745–59.

23. Heikkinen J, Honkanen R, Williams L, Leung J, Rauma P, Quirk S, et al. Depressive disorders, anxiety disorders and subjective mental health in common musculoskeletal diseases: A review. Maturitas. 2019.

24. Siviero P, Veronese N, Smith T, Stubbs B, Limongi F, Zambon S, et al. Association Between Osteoarthritis and Social Isolation: Data From the EPOSA Study. J Am Geriatr Soc. 2019.

25. Vennu V, Misra H, Misra A. Depressive symptoms and the risk of arthritis: A survival analysis using data from the osteoarthritis initiative. Indian J Psychiatry. 2019.

26. Yakushiji K, Fujita K, Matsunaga-Myoji Y, Mawatari M. Expectations and depression in patients who have undergone total hip arthroplasty in Japan: A prospective cohort study. Int J Orthop Trauma
Nurs. 2019.

27. Rice D, Mcnair P, Huymans E, Letzen J, Finan P. Best Evidence Rehabilitation for Chronic Pain Part 5: Osteoarthritis. J Clin Med. 2019;8:1219.

28. Nüesch E, Dieppe P, Reichenbach S, Williams S, Iff S, Jüni P. All cause and disease specific mortality in patients with knee or hip osteoarthritis: Population based cohort study. BMJ. 2011.

29. Parmelee PA, Tighe CA, Dautovich ND. Sleep disturbance in osteoarthritis: Linkages with pain, disability, and depressive symptoms. Arthritis Care Res. 2015.

30. Baumann M, Euler-Ziegler L, Guillemin F. Evaluation of the expectations osteoarthritis patients have concerning healthcare, and their implications for practitioners. Clin Exp Rheumatol. 2007.

31. Dubreuil M, Louie-Gao Q, Peloquin CE, Choi HK, Zhang Y, Neogi T. Risk of myocardial infarction with use of selected non-steroidal anti-inflammatory drugs in patients with spondyloarthritis and osteoarthritis. Ann Rheum Dis. 2018.

32. Bavry AA, Khaliq A, Gong Y, Handberg EM, Cooper-Dehoff RM, Pepine CJ. Harmful effects of NSAIDs among patients with hypertension and coronary artery disease. Am J Med. 2011.

33. Zeng C, Dubreuil M, Larochelle MR, Lu N, Wei J, Choi HK, et al. Association of Tramadol with All-Cause Mortality among Patients with Osteoarthritis. JAMA - J Am Med Assoc. 2019.

34. Lanas A, Boers M, Nuevo J. Gastrointestinal events in at-risk patients starting non-steroidal anti-inflammatory drugs (NSAIDs) for rheumatic diseases: The EVIDENCE study of European routine practice. Ann Rheum Dis. 2015.

35. Wells RE, Kaptchuk TJ. To Tell the Truth, the Whole Truth, May Do Patients Harm: The Problem of the Nocebo Effect for Informed Consent. Am J Bioeth. 2012.

36. Skou ST, Roos EM. Good Life with osteoArthritis in Denmark (GLA:D™): evidence-based education and supervised neuromuscular exercise delivered by certified physiotherapists nationwide. BMC Musculoskelet Disord. 2017.

37. Xu C, Roberts M, Driban J, McAlindon T, Eaton C, Lu B. Dietary patterns and symptomatic progression of knee osteoarthritis: data from the osteoarthritis initiative. Osteoarthr Cartil. 2019.

38. Svege I, Nordsletten L, Fernandes L, Risberg MA. Exercise therapy may postpone total hip replacement surgery in patients with hip osteoarthritis: a long-term follow-up of a randomised trial. 2015;:164–9.

39. National Clinical Guideline Centre (UK). Osteoarthritis Care and Management in Adults NICE Clinical Guidelines, No 177. National I. London; 2014.

40. Sharma A, Kudesia P, Shi Q, Gandhi R. Anxiety and depression in patients with osteoarthritis: Impact and management challenges. Open Access Rheumatol Res Rev. 2016.

41. Royal Australian College of General Practitioners. Guideline for the Management of Knee and Hip Osteoarthritis. Royal Aust. 2018.

42. Geenen R, Overman CL, Christensen R, Åsenlöf P, Capela S, Huisinga KL, et al. EULAR recommendations for the health professional's approach to pain management in inflammatory
arthritides and osteoarthritis. Ann Rheum Dis. 2018.

43. 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. Osteoarthr Cartil. 2014.

44. Larmer PJ, Reay ND, Aubert ER, Kersten P. Systematic review of guidelines for the physical management of osteoarthritis. Archives of Physical Medicine and Rehabilitation. 2014.

45. Witjes S, van Geenen RCI, Koenraadt KLM, van der Hart CP, Blankevoort L, Kerkhoffs GMMJ, et al. Expectations of younger patients concerning activities after knee arthroplasty: are we asking the right questions? Qual Life Res. 2017.

**Figures**

![Figure 1](image)

**Figure 1**

Patients reported joints with OA. Patients could select all the options that apply. Each column represents the localization(s) of OA as diagnosed by their medical doctor. Number of patients answering this question=1512. Number of answers=2277.
Figure 2

Patients' comorbidities as diagnosed by a medical doctor. Each respondent could mark all the options that apply. Number of patients answering this question=1512. Number of answers=3369.
Clinical symptoms, which have the most significant impact on patients’ daily life. Patients can select up to three options. Number of patients answering this question=1498. Number of answers=4095.

Limitations or issues experienced by the respondent due to OA. Number of patients answering this question=1455. Number of answers=3341.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- STROBEchecklistcrosssectional.doc
- Additionalfile3.docx
- Additionalfile2.docx
- Additionalfile1.docx
- Additionalfile4.docx