

USING AI BASED TECHNOLOGY TO GAIN INSIGHTS FROM OSTEOARTHRITIS PATIENTS IN THE UK VIA SOCIAL LISTENING

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Background: Osteoarthritis (OA) is a chronic degenerative joint condition associated with joint pain, stiffness, and mobility problems. More than half of OA patients live with moderate or severe pain[1], impacting all aspects of their lives and decreasing their overall Quality of Life (QoL). Social listening enables insight generation beyond the healthcare setting, demonstrating a more comprehensive view on disease burden and patient experiences. This study utilizes a unique approach based on Artificial Intelligence that analyses high volumes of data both quantitatively and qualitatively of patient-authored content.

Objectives: The study aims at exploring patient-generated online data as a source for capturing the real-world experience of OA patients, as reported by a large online population in the UK. A particular focus is on understanding the individually perceived disease burden in terms of symptoms, patient-reported QoL[2] and surgical treatment options.

Methods: A sample of real-world data from online health communities in the UK was collected between Oct 2019 until Jan 2022, resulting in a data set comprising n=6,354 algorithmically identified OA patients and n=42,353 posts (documents). OA-specific concepts to identify patient experiences were algorithmically coded using supervised machine learning, natural language processing (NLP) and knowledge graph tagging. An algorithmic stack of 40+ dedicated NLP analyzers was applied to detect key concepts and their relations of the patient experience in the posts (symptoms, their severity, impacts on QoL facets, perception of treatment options). Data were collected and processed in an anonymized, secure, and reliable way to ensure privacy and ethical aspects.

Results: Age could be algorithmically determined for N=1,012 patients (16% of total patients), 56% of whom are older than 50 years. Pain was the most discussed symptom (58% of patients; N=3,703). N=1,508 patients underwent surgeries, with hip (N=762) and knee replacements (N=674) as most reported procedures. Recreation & Leisure and Mobility were the most prominent QoL aspects (31% and 28% of patients). Healthcare availability (e.g. access to treatments) was raised by N=668 patients (11%); a proportion of these (N=150) also underwent hip or knee replacement, with more than half reporting having been on a “waiting list” for their surgical procedure.

Figure 1 shows five QoL aspects most relevant for patients with knee or hip replacement, together with improvement or worsening of the respective QoL aspect. Notably, a majority of patients in both groups report mobility and healthcare availability to deteriorate rather than improve.

Conclusion: This social listening study indicates pain as the most burdensome OA symptom and sheds light on the QoL impact of surgical procedures. Given limitations of social listening studies (e.g. number of identifiable age groups or gender)[3], the results need to undergo further validation by patient representatives and clinical experts. Yet, this novel method complements common approaches by providing an understanding of patients’ perspectives outside the clinic, representing the voices of vulnerable populations who may not otherwise

participate in clinical or epidemiological studies.

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