Risk Prediction of Osteoarthritis using Data Mining Classification Techniques

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Abstract:

Osteoarthritis (OA) is the most common reason of disability among the ageing population. The awareness of machine learning as a tool in medicine is growing rapidly and has provided new avenues for research into a number of diseases and infections. Creating better predictive models for these diseases could provide opportunities for better care, which we have applied to osteoarthritis, a degenerative disease that affects a large number of both gender in older population. A number of studies have been undertaken in order to understand the prediction of Osteoarthritis risks using data mining techniques. Hence, this study is focused at using two different types of s data mining techniques to predict Osteoarthritis risks in Nigerian patients using the Naïve Bayes' and the K nearest neighbor algorithms. The performances of these two classification techniques was evaluated in order to determine the most efficient and effective model. To achieve this, a dataset containing patients who have participated in an osteoarthritis treatment program was used and analyzed. The Naïve Bayes' showed a higher accuracy with lower error rates compared to that of the KNN method while the evaluation criteria proved the Naïve Bayes' to be a more effective and efficient classification techniques for the prediction of Osteoarthritis risks among patients of the study location. Our results shows that it is possible to predict an efficient and effective classifier for Osteoarthritis risks.

Keywords: Osteoarthritis, classification, prediction, risk factors, naïve bayes, K nearest neighbour

Publication of speakers:

1. Adebusoye LA, Ogunbode A.M, Alonge T.O (2013) ''Magnitude of knee osteoarthritis and

2. associated risk factors among adult patients presenting in a family clinic in Nigeria''. J, Med Trop 2013; 15; 144-50

3. Benko, A & Wilson, B. (2003) Online decision support gives plans an edge. Managed Healthcare Executive, Vol. 13 No. 5, p. 20.

4. Cross, E. Smith, D. Hoy, S. Nolte, I. Ackerman, M. Fransen, L. Bridgett, S. Williams, F. Guillemin, C. L. (2014) The global burden of hip and knee Osteoarthritis: estimates from the global burden of disease 2010 study. Annals of the Rheumatic Diseases, pages annrheumdis–2013, .

5. Gupta S., Kumar, D., Sharma, A (2011). Data Mining Classification Techniques Applied For Breast Cancer Diagnosis and Prognosis. Indian Journal of Computer Science and Engineering (IJCSE). Vol. 2 No. 2 pg 198-195, April, 2011. ISSN: 0976-5166.. Accessed on June 24, 2014.