Chronic low back pain is responsible for a large part of the global health costs requiring specialized care for a long time. The immense variability of patients in their therapeutic itineraries between hospitals and providers makes value-based healthcare potentially less viable. In order to advance more effectively in secondary, tertiary and quaternary prevention management and efforts, the adoption of data science tools, methods and techniques, through the use of machine learning models, is necessary, given that these models have been shown reliable in predicting specific results in various neurological diseases, but the development of management strategies for integrated practice units has not yet been tested with the aid of these techniques. In this study, we used a database from 6 different questionnaires to assess patients and apply correlation techniques between ordinal and nominal variables to determine which questions have the greatest effect on low back pain. In addition, 5 different machine learning algorithms were used to predict the absence or presence of low back pain in patients. As a result, 7 variables were selected to feed the prediction models, of which the one with the best accuracy was the XBoost Classifier, with accuracy, precision and recall of 0.8 and F1-Score of 0.78. The work conducted allows the reduction in the number of questions currently applied and assists in the screening process, based on the answer provided by each patient.