

## عنوان مقاله:

Discovering the Clinical Knowledge about Breast Cancer Diagnosis Using Rule-Based Machine Learning Algorithms

## محل انتشار:

فصلنامه آموزش بهداشت و ارتقا سلامت, دوره 10, شماره 1 (سال: 1400)

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## خلاصه مقاله:

**Aims:** Breast cancer represents one of the most prevalent cancers and is also the main cause of cancer-related deaths in women globally. Thus, this study was aimed to construct and compare the performance of several rule-based machine learning algorithms in predicting breast cancer. **Instrument & Methods:** The data were collected from the Breast Cancer Registry database in the Ayatollah Taleghani Hospital, Abadan, Iran, from December ۲۰۱۷ to January ۲۰۲۱ and had information from ۹۴۹ non-breast cancer and ۵۵۴ breast cancer cases. Then the mean values and K-nearest neighborhood algorithm were used for replacing the lost quantitative and qualitative data fields, respectively. In the next step, the Chi-square test and binary logistic regression were used for feature selection. Finally, the best rule-based machine learning algorithm was obtained based on comparing different evaluation criteria. The Rapid Miner Studio ۷.۱.۱ and Weka ۳.۹ software were utilized. **Findings:** As a result of feature selection the nine variables were considered as the most important variables for data mining. Generally, the results of comparing rule-based machine learning demonstrated that the J-۴۸ algorithm with an accuracy of ۰.۹۹۱, F-measure of ۰.۹۸۷, and also AUC of ۰.۹۹۹۷ had a better performance than others. **Conclusion:** It's found that J-۴۸ facilitates a reasonable level of accuracy for correct BC risk prediction. We believe it would be beneficial for designing intelligent decision support systems for the early detection of high-risk patients that will be used to inform proper interventions by the clinicians

## کلمات کلیدی:

Machine learning, Artificial intelligent, Data mining, Breast cancer, Decision tree

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