## LABORATORY ACTIVITIES. EVALUATION OF SIGNS AND DIAGNOSTIC TESTS THROUGH THE ROC CURVE

### The Purpose and Usefulness of the Practical Activity

* acquiring the skills needed to understand an evaluation study of the signs and diagnostic tests through the ROC analysis.

**The Proposed Scenario:**

The article titled "Study of Diagnostic Accuracy of the Florida Obsessive-Compulsive Inventory - Thai Version (FOCI-T)" will be used to meet the laboratory's requirements. The article is available at: <https://bmcpsychiatry.biomedcentral.com/articles/10.1186/s12888-015-0643-2>

**1. Aim and objectives:**

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**2. Field of research:**

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**3. Type of Study:**

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| * According to the objectives of the study: * According to the results: * According to the technique used in choosing groups: * Did the masking technique used to evaluate applied tests? |

**4. The Accessible Population and the Study Sample**

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| * Describe the accessible population: * Describe the study sample: * How many groups have been evaluated? What were these groups? |

**5. The Way Data is Collected**

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| * According to the population surveyed: * According to the duration of the data collection: * According to how the group or group of subjects is made |

**6. The Applied Diagnostic Tests**

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| * Describe the diagnostic test of interest: * Describe the reference test: |

**7. The Statistical Analysis and The Interpretation of the Results**

What were the methods used in the description of the sample (table / graph / what parameters were used)?

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* Have there been statistically significant differences between the investigated groups in terms of the characteristics of the subjects participating in the study? (consider the following characteristics: gender, age, marital status, and level of education) (Table 2)

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* Is the FOCI-T test useful in discriminating the pathology of interest? Give arguments about the answer (Figure 2)

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* What is the threshold value of FOCI-T that allows subjects with obsessive-compulsive disorder (OCD) to be discriminated against from non OCT subjects and the healthy subjects? Calculate for this threshold value the values d2 and J. Is the value J the maximum for the reported threshold value? (Table 3)

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* What is the threshold value of FOCI-T that allows subjects with obsessive-compulsive disorder (OCD) to be discriminated against from healthy subjects? Calculate for this threshold value the values ​​d2 and J. Is the value J the maximum for the reported threshold value? (Table 3)

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* What is the best threshold for FOCI-T to discriminate the subjects with OCD compared to those with other pathologies or healthy ones? (Table 3)

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* Appreciate the accuracy of the test based on AUC and on the associated confidence intervals. (Figure 2)

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**8. Discussions**

* Is the FOCI-T test a useful test in identifying patients with OCD? Give arguments about the answer. (Figure 2)

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**9. Conclusions**

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## To be remember

* The ROC / AUC analysis needs a diagnostic test to be examined against a baseline test.
* Perfect reference test - Se and Sp valid.
* The ROC / AUC analysis can be applied only if the reference test is a continuous or qualitative ordinal variable with at least 5 possible values.
* The optimum threshold value for the continuous value test is given by J = max (Se + Sp-1).
* The ROC analysis allows the assessment of the global validity of a diagnostic test.
* The correct interpretation of AUC is based on the trust / confidence interval of 95%.
* Do not use AUC as a method of comparing two tests if the ROC curves of the tests of interest intersect.

***Useful for Dissertations***

The ROC / AUC analysis is done with dedicated statistical programs. However, there are several free online implementations that allow for an ROC / AUC analysis:

* Web-based Calculator for ROC Curves - Johns Hopkins University School of Medicine: <http://www.rad.jhmi.edu/jeng/javarad/roc/JROCFITi.html> (accessed February 18, 2018)
* easyROC: a web-tool for ROC curve analysis: <http://www.biosoft.hacettepe.edu.tr/easyROC/> (accessed February 18, 2018)
* ROC analysis for test with continuous outcome – EpiTools: <http://epitools.ausvet.com.au/content.php?page=ROC_curves> (accessed February 18, 2018)