

## **Statistical review**

### **Global Longitudinal Strain overcomes ejection fraction for detecting myocardial dysfunction in End-Stage Renal Disease with hyperparathyroidism.**

The phase in which the statistician intervened was after obtaining data and observations from the sample; from which, a multiple regression analysis was performed and pertinent comments were made on the results to guide the team of researchers in their findings.

Initially, all the variables in the database were considered to determine their influence on the variable of interest, where assumptions of linearity between the explanatory variables and the dependent variable were reviewed, the independence of the measurement errors was verified with the Durbin-Watson statistic, scatter plots were used to verify homoscedasticity, normal probability plots (P-P) of regression of the standardized residuals were observed and the Kolmogorov-Smirnov test was carried out to know if the normality assumptions were met; collinearity diagnoses were also performed where the tolerance index and the variance inflation factor (VIF) were reported. In addition, a Confirmatory Factor Analysis (CFA) was performed to determine to what degree certain variables influence others and even a latent construct such as myocardial failure, which is determined by different observable variables.

By disclosing the results in the verification of assumptions to perform the multiple linear regression, the goodness of fit analysis was performed and the explained variance was observed. A comparison of the predicted model was made with the proposed model and the standardized and non-standardized coefficients of the explanatory variables were presented.

Once the assumptions were verified and three base models defined for each dependent variable (SGL, PTH and DDVI) were structured, three scenarios were reviewed for each model: in the first, a simple linear regression was carried out; in the second, the model was adjusted only with the variables that are significant in the univariate analysis; and in the third scenario, a multiple regression by steps was carried out, where significant variables were removed or added to choose the set that best fits. It was suggested to stay with the structure of the models in this last scenario, since it improved the fit and maintained the principle of parsimony for its interpretation.



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