**Table S2. Multivariate linear regression analysis models for Olfactory Test Scores in Patients with PD**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Dependent variables** | **Significant variable\*** | **B** | **Standardized β** | **t** | **P value** | **R2** | **R2 change** | **VIF** |
| **a) TDI score** | Total |  |  |  | <0.001 | 0.160 |  |  |
|  | Constant | 18.635 |  | 4.955 | <0.001 |  |  |  |
|  | Age (years) | -0.213 | -0.262 | -6.003 | <0.001 |  | 0.111 | 1.106 |
|  | MMSE | 0.508 | 0.229 | 5.187 | <0.001 |  | 0.041 | 1.135 |
|  | Gender (male=1, female=0) | -1.479 | -0.092 | -2.186 | 0.029 |  | 0.008 | 1.032 |
| **b) Threshold score** | Total |  |  |  | <0.001 | 0.075 |  |  |
|  | Constant | 6.740 |  | 3.951 | <0.001 |  |  |  |
|  | Age (years) | -0.078 | -0.220 | -4.831 | <0.001 |  | 0.064 | 1.100 |
|  | MMSE | 0.105 | 0.109 | 2.389 | 0.017 |  | 0.011 | 1.100 |
| **c) Discrimination score** | Total |  |  |  | <0.001 | 0.152 |  |  |
|  | Constant | 8.095 |  | 5.199 | <0.001 |  |  |  |
|  | Age (years) | -0.093 | -0.278 | -6.336 | <0.001 |  | 0.115 | 1.106 |
|  | MMSE | 0.181 | 0.198 | 4.466 | <0.001 |  | 0.030 | 1.135 |
|  | Gender (male=1, female=0) | -0.573 | -0.087 | -2.046 | 0.041 |  | 0.007 | 1.032 |
| **d) Identification score** | Total |  |  |  | <0.001 | 0.111 |  |  |
|  | Constant | 4.880 |  | 3.099 | 0.002 |  |  |  |
|  | MMSE | 0.190 | 0.219 | 4.640 | <0.001 |  | 0.074 | 1.216 |
|  | Age (years) | -0.038 | -0.120 | -2.635 | 0.009 |  | 0.019 | 1.133 |
|  | UPDRS II | -0.048 | -0.105 | -2.301 | 0.022 |  | 0.010 | 1.136 |
|  | Gender (male=1, female=0) | -5.73 | -0.091 | -2.098 | 0.036 |  | 0.008 | 1.032 |

\*Multiple linear regression analysis included those independent variables: age, sex, educational years, smoking status, disease duration, UPDRS-II points, UPDRS-III points, dyskinesia, MMSE, NMSS (cardiovascular dysfunction, sleep dysfunction, mood dysfunction, perceptual problems, gastrointestinal, urinary and sexual dysfunction). Variables with P value > 0.05 were excluded. The final model were reported here only with significant variates.

MMSE, Mini-Mental State Examination; UPDRS II, the Unified Parkinson’s Disease Rating Scale part II which evaluate the ability of daily living; B, unstandardized coefficients. R2 indicate that the model is able to explain how much variance in dependent variable. R2 change refer to the change of R2 value when the variable entered the equation of linear regression. VIF, variance inflation factor, they are no multicollinearity between the independent variables if VIF < 5.