**Statistical Analysis**

Descriptive statistics were reported for all the demographic, clinical characteristics, neuropsychiatric symptoms, and other clinical scales according to Hispanics and non-Hispanics. Normal quantitative variables were described using mean ± standard deviation (SD) otherwise summarized with median and interquartile range. A log transformation was made to induce normality if needed. The categorical variables were described using frequency and proportions.

*hclustvar* function under the R package *ClustOfVar* 19 andnumber of clusters were chosen based on the aggregation plot and the plot of the mean over the B samples (B = 200, where B is the number of bootstrap samples) of the adjusted Rand index (a measure of the similarity between two data clustering). Further, to validate the number of clusters with consistent NPS within each cluster, *hclustvar* function was replicated 2000 times on bootstrap samples of 300 sample size. At the second stage after determining an appropriate number of clusters of NPS with specific NPS, a factor analysis was performed using a polychoric correlation matrix to determine factor loading and unique variance for each variable within each NPS subtype. A score of each NPS subtype was calculated using the sum of the cluster-specific NPS values (0 or 1) multiplied by the coefficients of the cluster specific NPS (factor loadings obtained from the principal component method under factor analysis). Also, linear regression analyses were performed to determine factors associated with the subtypes of NPS and reported with regression coefficient and p-value. A p-value of less than 5% was considered statistically significant result. All statistical analyses were performed by standard statistical software R version 3.5.3 (copyright 2019) and STATA 15.1 (StataCorp, College Station, TX).

**Results**

The subtype1 included agitation/aggression, apathy/indifference, and irritability and labeled as psychomotor apathy whereas subtype2 included depression and anxiety showing affective mood related behaviors. Subtype3 included the remaining two NPS (night-time behaviors and eating/appetite disturbances) and explained the physical behavior. Based on the factor loadings and unique variances reported in Table 2, agitation and irritability compared with apathy mostly predicted “psychomotor apathy” whereas depression/dysphoria and anxiety equally contributed to “affective mood”. Similarly, night-time behaviors and eating/appetite equally contributed to the “physical behavior” score of NPS.

*Associated factors with NPS subtypes*

Hispanic ethnicity, increased depression score, and presence of comorbidities showed increased scores of all the three NPS subtypes including total NPS. However, subjects with Hispanic ethnicity and increased depression score demonstrated a higher score of psychomotor apathy followed by affective mood and physical behavior. The higher education level was negatively associated with total NPS score and only associated with psychomotor apathy and affective mood of NPS. In the adjusted analysis, subjects with Hispanic ethnicity showed significantly increased score with total NPS and its subtype psychomotor apathy.