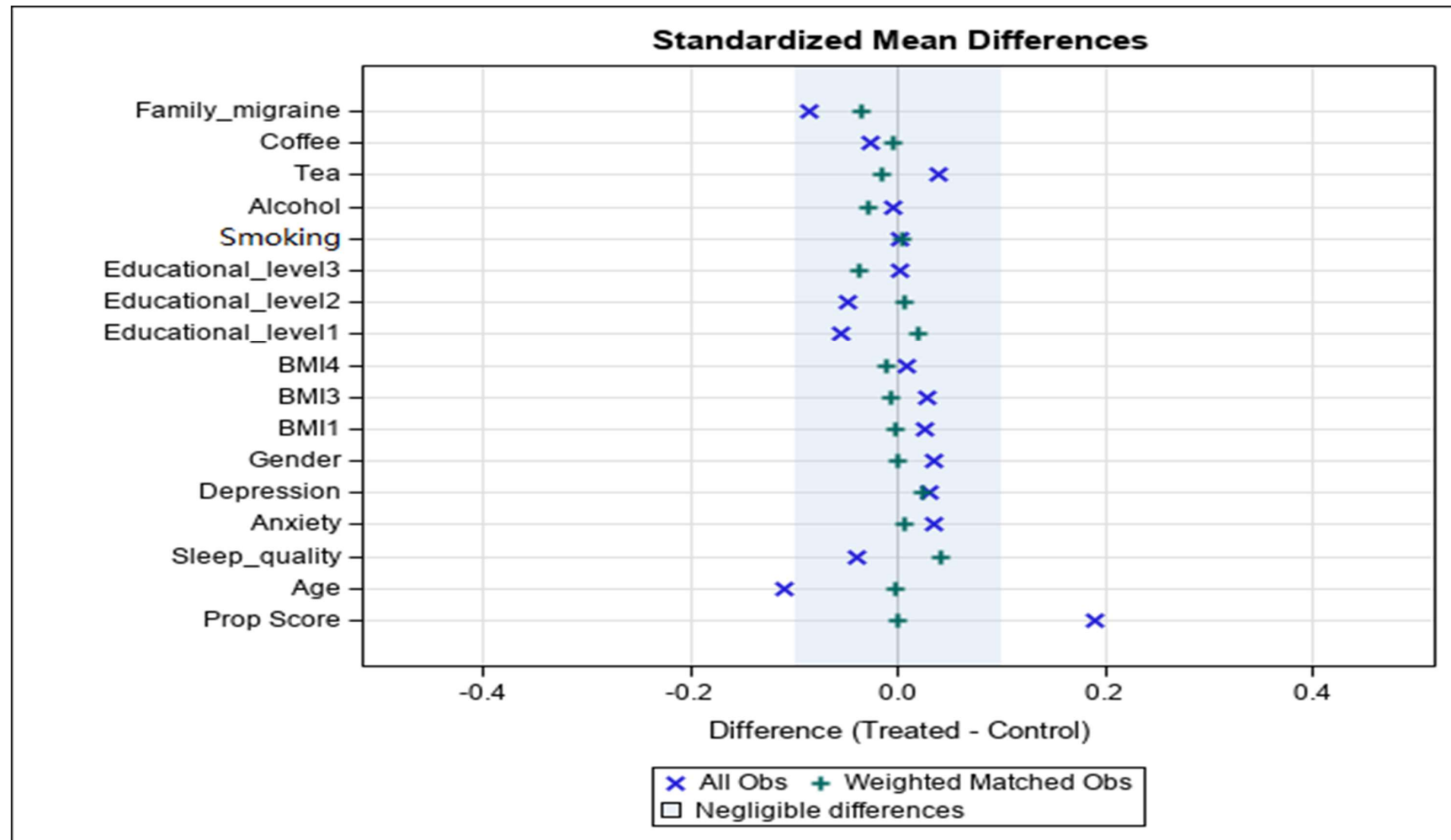


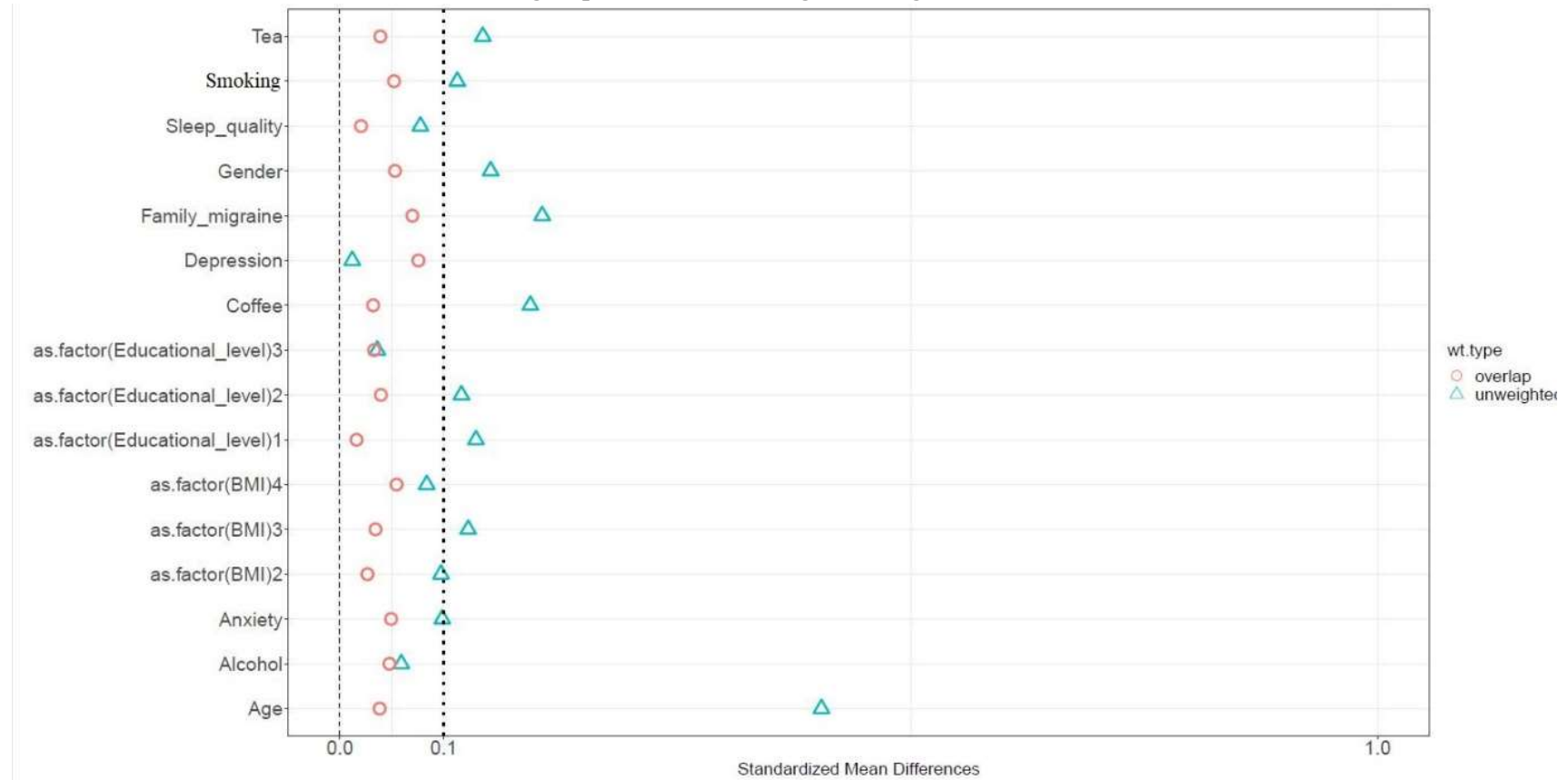
**Supplemental Table A. The indicate number of participants with missing data**

Value	Number	Missing data
Screening for PFO	3741	none
Age	3741	none
Gender	3741	none
BMI	3639	102
Educational level	3557	184
Smoking	3624	117
Alcohol	3505	236
Tea	3598	143
Coffee	3598	143
Sleep quality	3599	142
Anxiety	3614	127
Depression	3608	133
Family history of migraine	2752	99

**Supplemental Table B. The standardized mean differences of all variables before and after 1:2 nearest neighbor matching for groups with and without PFO**



**Supplemental Table C. The standardized mean differences of all variables before and after generalized overlap weighting for groups with different degrees of right-left shunt**



**Supplemental Table D. Marginal distributions of the estimated RLS degrees generalized propensity scores**