Supplementary Table 1.

*Moderation Effect of Sleep on the Relationship between Recent Repetitive Head Impact Exposure and Neuropsychological Function (N* = 49)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Sleep Duration | | | | | | | Sleep Quality | | | | | | |
|  |  | CI95% for *b* | | | |  | |  | CI95% for *b* | | | | |  |
| Predictor | *β* | Lower | | | Upper | *p* | | *β* | | Lower | | Upper | *p* | |
| **NP Domain** | |  | |  | |  | |  | | | |  | |  |
| Attention/Working Memorya | |  | |  | |  | | Attention/Working Memoryc | | | | | |  |
| Recent RHI | -0.16 | | -0.43 | | 0.14 | | .31 | -0.23 | | -0.54 | 0.12 | | .20 | |
| Sleep | 0.04 | | -0.16 | | 0.19 | | .84 | -0.18 | | -0.15 | 0.07 | | .47 | |
| RHI x Sleep | 0.20 | | -0.13 | | 0.42 | | .31 | -0.01 | | -0.16 | 0.15 | | .98 | |
| Processing Speeda |  |  | |  | |  | | Processing Speedc | | | |  | |  |
| Recent RHI | -0.31 | | -0.62 | | -0.01 | | .04\* | -0.43 | | -0.76 | -0.10 | | .01\* | |
| Sleep | 0.40 | | 0.01 | | 0.39 | | .04\* | -0.03 | | -0.11 | 0.10 | | .92 | |
| RHI x Sleep | -0.14 | | -0.41 | | 0.18 | | .45 | 0.07 | | -0.13 | 0.17 | | .78 | |
| Executive Functiona |  |  | |  | |  | | Executive Functionc | | | |  | |  |
| Recent RHI | 0.08 | | -0.20 | | 0.33 | | .61 | -0.17 | | -0.39 | 0.13 | | .32 | |
| Sleep | 0.24 | | -0.07 | | 0.27 | | .23 | -0.22 | | -0.12 | 0.05 | | .37 | |
| RHI x Sleep | 0.03 | | -0.24 | | 0.28 | | .89 | 0.24 | | -0.06 | 0.18 | | .32 | |
| Learning/Memoryb |  |  | |  | |  | | Learning/Memoryc | | | |  | |  |
| Recent RHI | 0.32 | | 0.01 | | 0.51 | | .04\* | 0.25 | | -0.07 | 0.43 | | .15 | |
| Sleep | 0.16 | | -0.10 | | 0.22 | | .41 | 0.10 | | -0.07 | 0.10 | | .70 | |
| RHI x Sleep | -0.07 | | -0.29 | | 0.21 | | .74 | 0.02 | | -0.11 | 0.12 | | .93 | |
| PVTa |  |  | |  | |  | | PVTc |  | | |  | |  |
| Recent RHI | 0.14 | | -8.90 | | 27.63 | | .31 | 0.10 | | -16.11 | 29.13 | | .56 | |
| Sleep | 0.09 | | -8.57 | | 14.41 | | .61 | 0.24 | | -3.59 | 10.96 | | .31 | |
| RHI x Sleep | -0.47 | | -41.79 | | -6.26 | | .01\* | 0.11 | | -7.80 | 12.78 | | .63 | |

*Note.* RHI = Repetitive Head Impact, PVT = Psychomotor Vigilance Test. \*Indicates *p* < .05.

aCovariates: WTAR, anxiety, concussion history

bCovariates: WTAR, depression, anxiety, race, concussion history

cCovariates: WTAR, depression, anxiety, years of heading, race, concussion history

Supplementary Table 2.

*Moderation Effect of Sleep on the Relationship between Long-term Repetitive Head Impact Exposure and Neuropsychological Function (N* = 49)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Sleep Duration | | | | Sleep Quality | | | |
|  |  | CI95% for *b* | |  |  | CI95% for *b* | |  |
| Predictor | *β* | Lower | Upper | *p* | *β* | Lower | Upper | *p* |
| **NP Domain** | |  |  |  |  | |  |  |
| Attention/Working Memorya | |  |  |  | Attention/Working Memoryc | | | |
| Long-term RHI | 0.15 | -0.14 | 0.40 | .33 | 0.08 | -0.23 | 0.38 | .63 |
| Sleep | 0.17 | -0.12 | 0.23 | .55 | -0.10 | -0.13 | 0.08 | .66 |
| RHI x Sleep | 0.18 | -0.15 | 0.39 | .37 | -0.12 | -0.19 | 0.11 | .59 |
| Processing Speeda |  |  |  |  | Processing Speedc | | |  |
| Long-term RHI | 0.05 | -0.25 | 0.35 | .73 | -0.03 | -0.36 | 0.31 | .88 |
| Sleep | 0.28 | -0.06 | 0.34 | .16 | -0.01 | -0.11 | 0.11 | .97 |
| RHI x Sleep | 0.06 | -0.25 | 0.34 | .76 | 0.08 | -0.13 | 0.18 | .73 |
| Executive Functiona |  |  |  |  | Executive Functionc | | |  |
| Long-term RHI | 0.18 | -0.10 | 0.40 | .23 | -0.07 | -0.29 | 0.19 | .67 |
| Sleep | 0.24 | -0.06 | 0.26 | .21 | -0.18 | -0.11 | 0.05 | .45 |
| RHI x Sleep | 0.11 | -0.18 | 0.32 | .57 | 0.22 | -0.06 | 0.17 | .36 |
| Learning/Memoryb |  |  |  |  | Learning/Memoryc | | |  |
| Long-term RHI | 0.28 | -0.01 | 0.46 | .07 | 0.16 | -0.11 | 0.35 | .31 |
| Sleep | 0.29 | -0.04 | 0.28 | .15 | 0.00 | -0.08 | 0.08 | .99 |
| RHI x Sleep | -0.18 | -0.34 | 0.13 | .35 | 0.15 | -0.07 | 0.14 | .52 |
| PVTa |  |  |  |  | PVTc |  |  |  |
| Long-term RHI | -0.13 | -27.22 | 9.24 | .33 | -0.15 | -30.54 | 10.60 | .33 |
| Sleep | -0.09 | -14.89 | 8.73 | .60 | 0.35 | -1.56 | 12.19 | .13 |
| RHI x Sleep | -0.23 | -29.39 | 6.77 | .21 | -0.05 | -10.67 | 8.64 | .83 |

*Note.* RHI = Repetitive Head Impact, PVT = Psychomotor Vigilance Test.

aCovariates: WTAR, concussion history

bCovariates: WTAR, depression, race, concussion history

cCovariates: WTAR, depression, anxiety, years of heading, race, concussion history