Table S1. Principal component loadings for the five cognitive function tasks analysed from the ELSA.

|  |  |  |  |
| --- | --- | --- | --- |
| Measure | Wave 1 PCA | Wave 2 PCA | Wave 3 PCA |
| Immediate Recall | 0.83 | 0.82 | 0.85 |
| Delayed Recall | 0.83 | 0.84 | 0.85 |
| Prospective Memory | 0.51 | 0.54 | 0.49 |
| Fluency | 0.72 | 0.71 | 0.73 |
| Letter Cancellation Accuracy | 0.57 | 0.57 | 0.57 |

Table S2

Bivariate, zero order correlations between the variables entered into the model.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | W1P | W2P | W3P | W1D | W2D | W3D | W1C | W2C | W3C | YOB | SEX |
| W1P | - |  |  |  |  |  |  |  |  |  |  |
| W2P | 0.38\*\* | - |  |  |  |  |  |  |  |  |  |
| W3P | 0.38\*\* | 0.48\*\* | - |  |  |  |  |  |  |  |  |
| W1D | 0.21\*\* | 0.19\*\* | 0.15\*\* | - |  |  |  |  |  |  |  |
| W2D | 0.21\*\* | 0.21\*\* | 0.23\*\* | 0.56\*\* | - |  |  |  |  |  |  |
| W3D | 0.27\*\* | 0.18\*\* | 0.24\*\* | 0.57\*\* | 0.56\*\* | - |  |  |  |  |  |
| W1C | -0.14\*\* | -0.21\*\* | -0.16\*\* | -0.20\*\* | -0.17\*\* | -0.13\* | - |  |  |  |  |
| W2C | -0.13\*\* | -0.17\*\* | -0.13\* | -0.21\*\* | -0.14\*\* | -0.15\*\* | 0.69\*\* | - |  |  |  |
| W3C | -0.14\* | -0.24\*\* | -0.18\*\* | -0.21\*\* | -0.20\*\* | -0.20\*\* | 0.68\*\* | 0.71\*\* | - |  |  |
| YOB | -0.07 | -0.05 | -0.02 | -0.01 | -0.06 | 0.04 | 0.37\*\* | 0.46\*\* | 0.44\*\* | - |  |
| SEX | -0.01 | 0.00 | 0.00 | 0.09\* | 0.13\*\* | 0.12\* | 0.03 | 0.10 \* | 0.04 | 0.05 | - |

Note: W = Wave, P = Pain, D = Depression, C = Cognitive Function, YOB = Year of Birth. \* = *p* <. .05, \*\* = *p* < .01. The *p* values were not corrected for multiple comparisons.

Table S3. Supplementary analysis exploring whether treatment engagement mediated the relationship between wave 1 cognitive function and wave 2 pain.

|  |  |
| --- | --- |
| Item | Loading |
| 1 | 0.79 |
| 2 | 0.83 |
| 3 | 0.75 |
| 5 | 0.34 |

Note: Respondents at wave 2 reporting a new osteoarthritis diagnosis, or a wave 1 osteoarthritis and osteoporosis diagnosis, were asked the following questions, all answered yes (1) or no (0):

Has any doctor or nurse ever talked to you about…

1. What your arthritis or joint pain will be like as time goes on?

2. How to keep your arthritis or joint pain from getting worse?

3. How your arthritis or joint pain will be treated?

4 (if answered ‘yes’ to 3). What the specific purpose of the treatment for your arthritis or joint pain is?

5. Some doctors suggest trying paracetamol as the first medication for arthritis or joint pain. Did any doctor or nurse recommend you try paracetamol before other medications for your joint pain?

Items 1, 2, 3 and 5 were entered into a PCA (item 4 was excluded, but retained to calculate the summed score) because it was nested within item 3, and so not asked of any respondents who said no to Q3). A parallel analysis indicated a single component model was the best fit. Table S3 reports the component loadings. Because these loaded onto a single component, scores to the five questions were summed as an index of treatment engagement. This summed score (frequencies – 0 = 72, 1 = 51, 2 = 40, 3 = 35, 4 = 29, 5 = 25) was then correlated against wave 1 (*r*(250) = 0.096, *p* = .128) and wave 2 cognitive function (*r*(250) = 0.086, *p* = .171), and wave 2 pain (*r*(250) = 0.035, *p* = .575) and depression (*r*(250) = -0.008, *p* = .905), indicating no evidence of a significant relationship.

Table S4. Unstandradized associations between the dependent variables in the model at each wave.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Measure | Measure | *b* | *se* | *P* |
| W1 Pain | W1 Depression | 0.401 | 0.086 | <.001 |
| W1 Pain | W1 C.F. | -0.113 | 0.037 | .002 |
| W1 Depression | W1 C.F. | -0.400 | 0.076 | <.001 |
| W2 Pain | W2 Depression | 0.143 | 0.071 | .044 |
| W2 Pain | W2 C.F. | -0.009 | 0.029 | .767 |
| W2 Depression | W2 C.F. | 0.043 | 0.049 | .383 |
| W3 Pain | W3 Depression | 0.160 | 0.073 | .029 |
| W3 Pain | W3 C.F. | -0.019 | 0.027 | .480 |
| W3 Depression | W3 C.F. | -0.095 | 0.045 | .046 |

Note: C.F. = Cognitive function, W = wave