

# INVESTIGATING THE EFFECTS OF COVID-19 ON MEMORY: THE RELATIONSHIP BETWEEN AGE AND SHORT-TERM MEMORY

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## INTRODUCTION

- Long COVID is described as symptoms persisting beyond four weeks post initial COVID-19 infection.
- 10-20% of SARS-CoV-2 infected individuals develop long COVID symptoms.
- Approximately 2 million UK residents (3% of population) reported experiencing long COVID as of March 2023
- A common manifestation of Long COVID is deficits in working memory, colloquially known as "brain fog."
- Previous studies indicate neurocognitive issues post-discharge, prompting investigation into COVID-19's impact on memory.

## OBJECTIVES

1. Identify how testing positive for COVID-19 may affect memory function as shown by performance on a short-term memory test.
2. Identify how being hospitalized due to COVID-19 infection affects memory function when compared to not being hospitalized.
3. Explore the relationship between age and objective total memory scores.

## METHODOLOGY

- Data analyzed from the 'COVID-19 Online Rapid Objective Neuro-memory Assessment' (CORONA) study.
- Study utilized an online survey with a timed memory task based on 4 image categories and collected relevant demographic data.
- Global recruitment of participants aged 18 and older, with 5,308 participants included in analysis.
- Memory scores obtained through task featuring four categories:
  1. Negative results for COVID-19
  2. Positive Result for COVID-19
  3. Positive Result for COVID-19 + Hospitalized patient
  4. Positive Result for COVID-19 + not Hospitalized patient
- Statistical analysis conducted, including T-tests and linear regression, to evaluate data.

## RESULTS & ANALYSIS

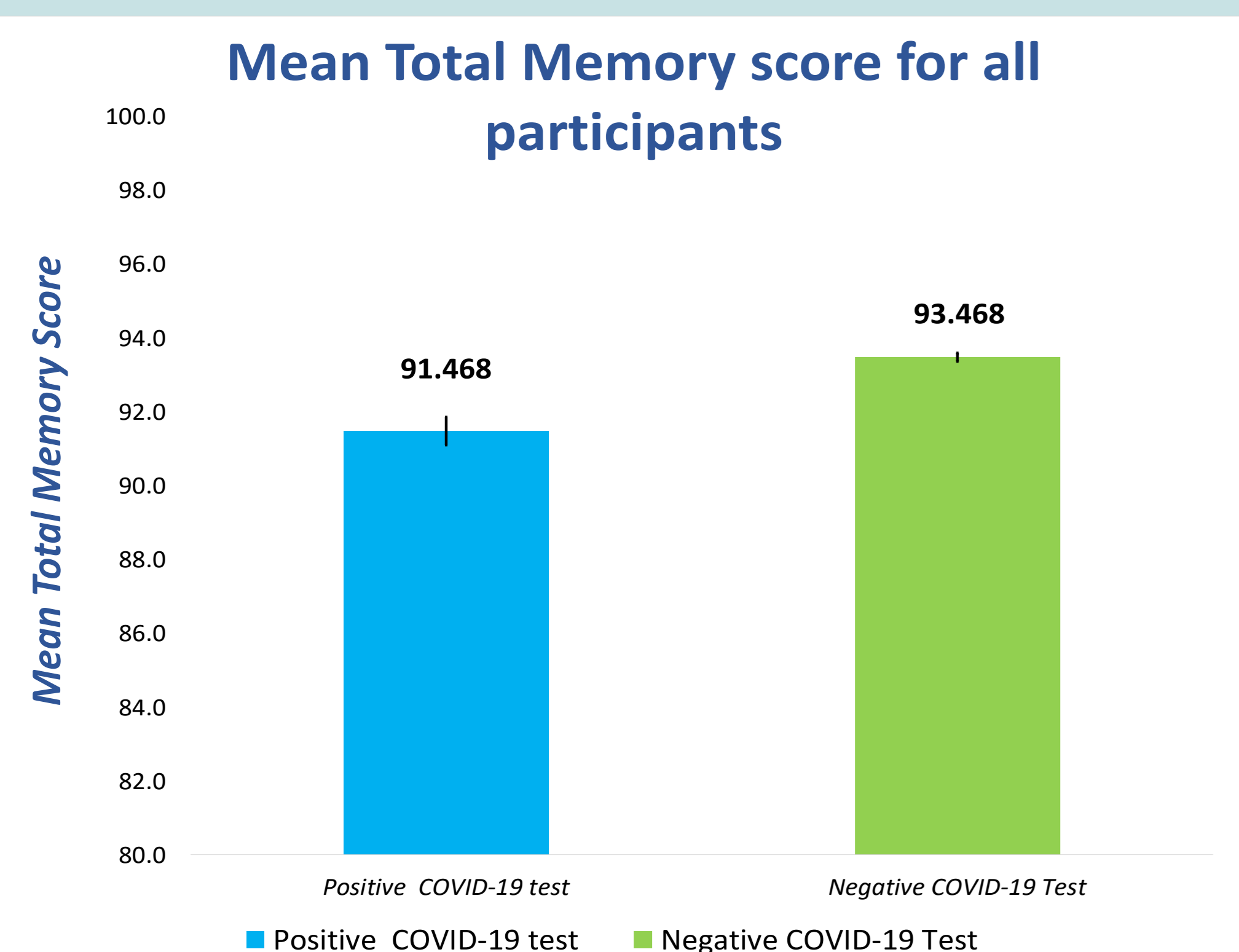


Figure 1. A bar chart comparing the mean total memory score between participants who tested positive for COVID-19 and those who were negative for COVID-19.

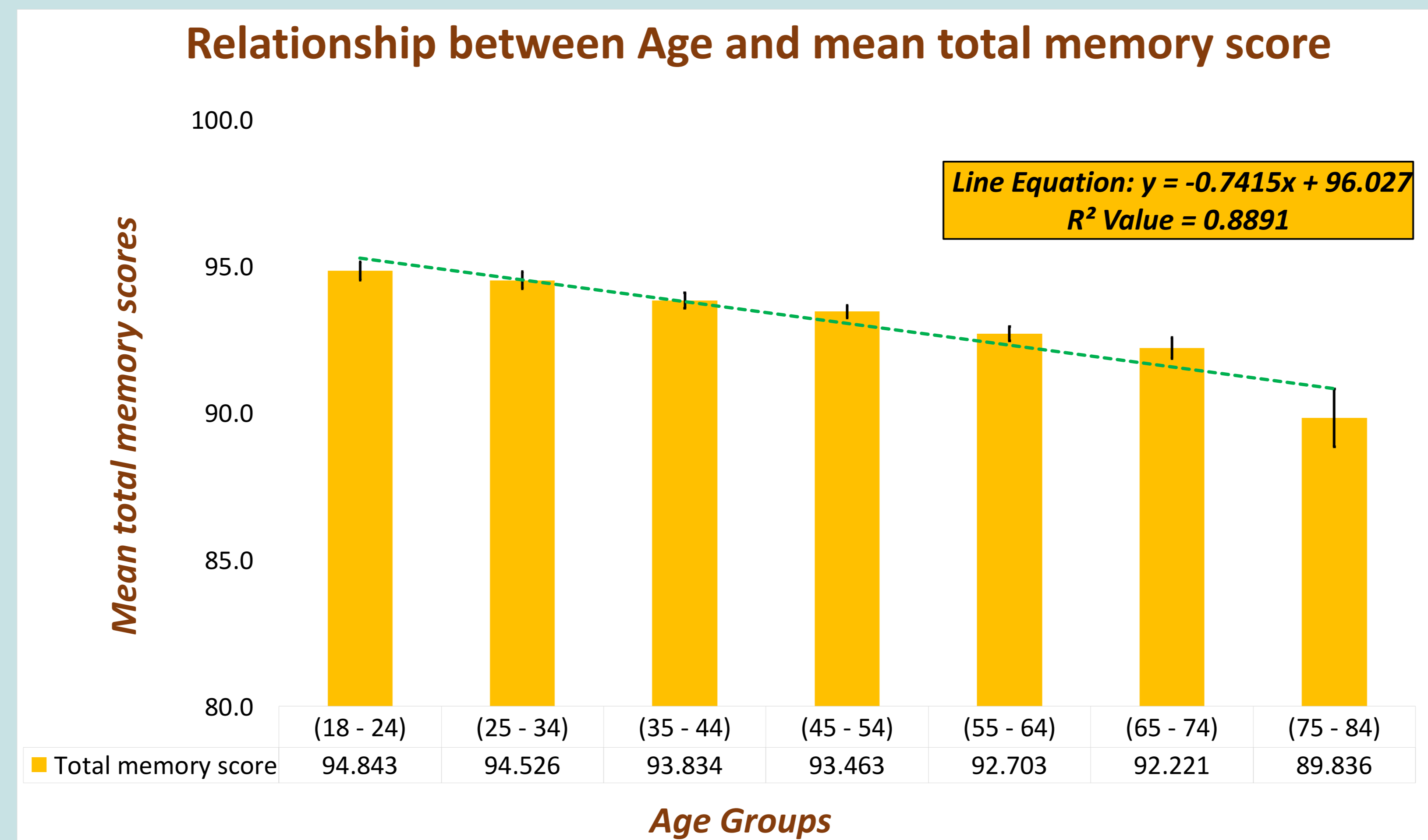


Figure 3. A bar chart illustrating the mean total memory scores amongst all participants in each age group.

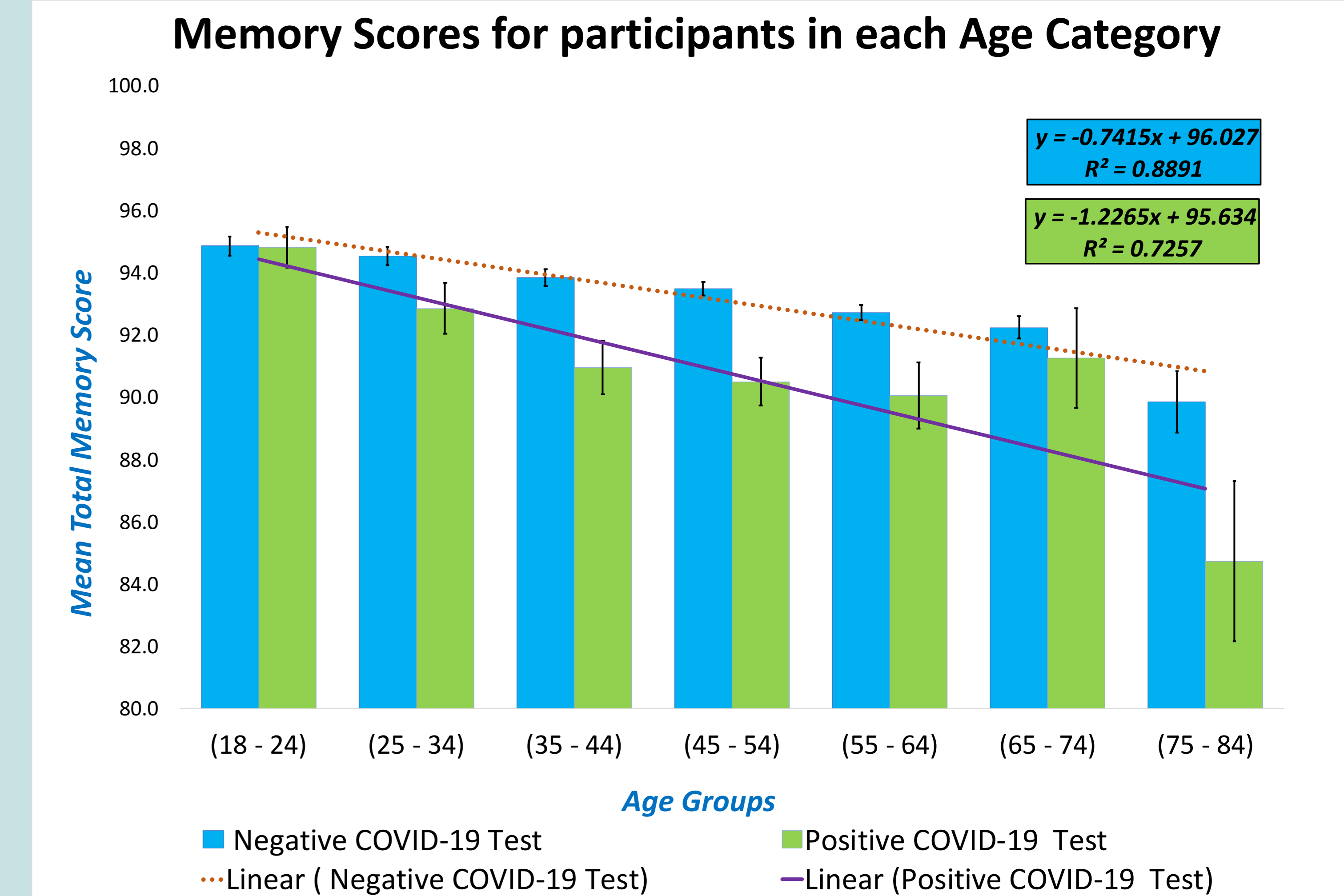


Figure 4. A bar chart comparing the mean total memory scores between participants who tested positive and participants who tested negative in each age group.

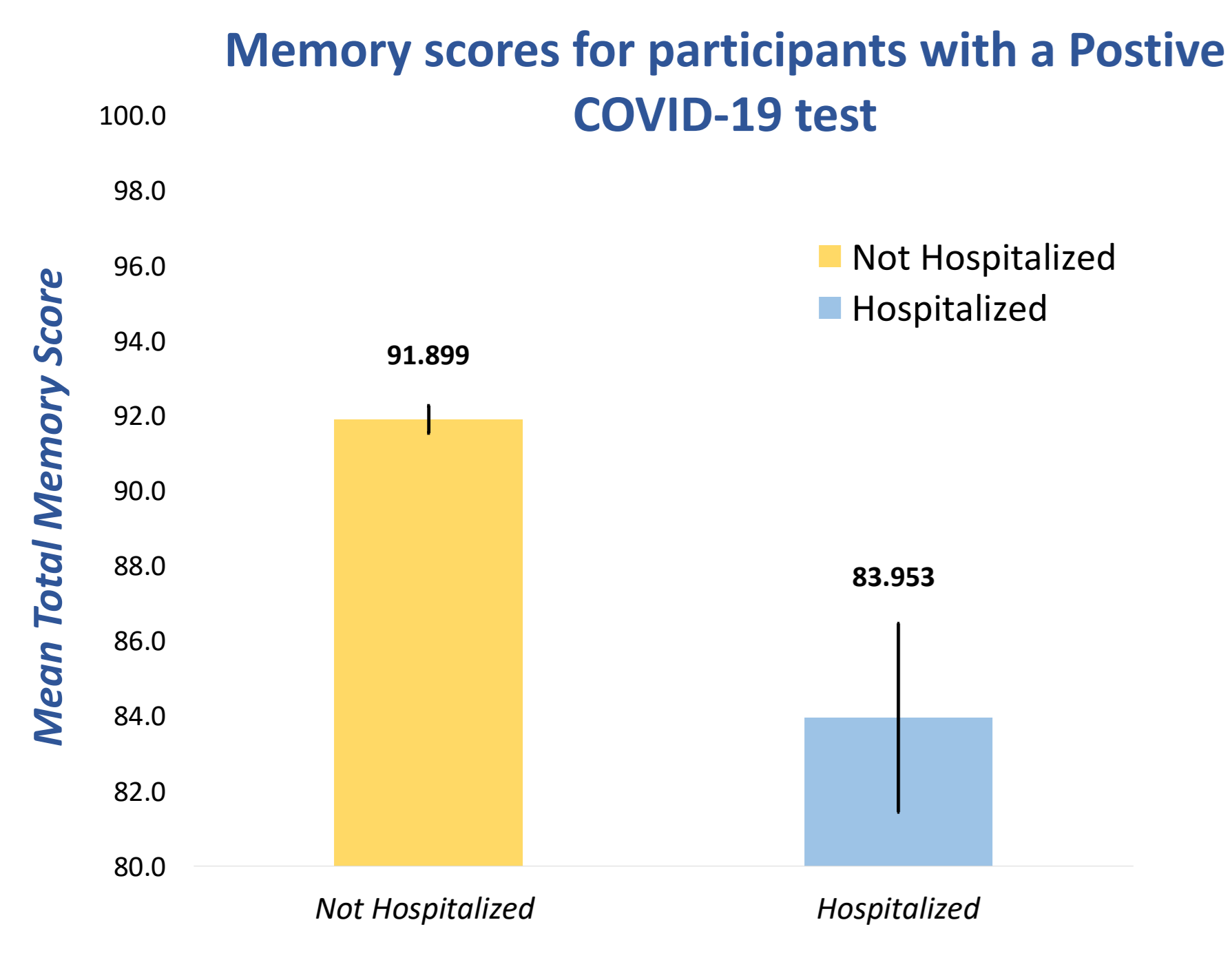


Figure 2. A bar chart comparing the mean total memory scores of participants who tested positive for COVID-19 who were hospitalized due to COVID-19 infection and those who were not hospitalized due to COVID-19.

## SUMMARY

- COVID-19 infection linked to worsened memory outcomes and cognitive function, particularly in hospitalized patients.
- Age appears to amplify the impact of COVID-19 on memory decline, indicating potential age-related vulnerability.
- Larger, more diverse studies needed to validate findings and understand long-term effects.
- Understanding neurological impact crucial for managing Long COVID symptoms effectively.

Table 2. P-values for each age group

| Age Range             | (18 - 24) | (25 - 34) | (35 - 44)    | (45 - 54)    | (55 - 64)    | (65 - 74) | (75 - 84) |
|-----------------------|-----------|-----------|--------------|--------------|--------------|-----------|-----------|
| Participant Count (n) | 638       | 673       | 959          | 1358         | 1127         | 441       | 108       |
| P-Values              | 0.964     | 0.053     | <b>0.002</b> | <b>0.001</b> | <b>0.017</b> | 0.559     | 0.092     |

P-values calculated using a two-tailed T-test for participants in each age group to establish whether there is a significant difference in memory test scores for the participant sub-group who tested positive for COVID-19 and the subgroup which was negative for COVID-19. The count for participants in each age group has been included for comparison. The statistical significance is determined according to the P-values and shown by YES (P<0.05) or NO (P>0.05) for each age group.