Divergent patterns of cognitive deficits and structural brain alterations between older adults in mixed-sex and same-sex relationships

Riccardo Manca 1 | Anthony N Correro II 2 | Kathryn Gauthreaux 3 | Jason D. Flatt 4

1 Brunel University London, Uxbridge, United Kingdom
2 VA Ann Arbor Healthcare System & Michigan Medicine Consortium, Ann Arbor, MI, USA
3 National Alzheimer’s Coordinating Center, University of Washington, Seattle, WA, USA
4 University of Nevada Las Vegas School of Public Health, Las Vegas, NV, USA

Abstract

Background: Sexual minority (SM) or lesbian, gay, bisexual, and queer older adults experience health disparities that may cause cognitive decline. Several studies have reported higher rates of subjective cognitive complaints in SM older adults, but evidence of increased cognitive decline has been inconsistent. One study found that older adults with Alzheimer’s disease (AD) in same-sex relationships (SSR), compared to mixed-sex relationships (MSR), had more severe neuropsychiatric symptoms associated with atrophy in fronto-temporal regions. We sought to compare behavioral and structural brain parameters of SSR and MSR older adults and evaluate their impact on cognitive performance.

Method: National Alzheimer’s Coordinating Center data were selected according to the following inclusion criteria: 55+ years of age, presence of a co-participant, and availability of brain volume and mean thickness data. Clinical Dementia Rating® (CDR®) scores were used to assign participants to cognitively impaired (CI; CDR® ≥ 0.5) or cognitively unimpaired (CU; CDR® < 0.5) groups. We identified 1076 MSR (583 CU) and 38 SSR (25 CU) participants with Mini-Mental State Exam (MMSE) and Neuropsychiatric Inventory Questionnaire (NPI-Q) data within six months of a study visit. Comprehensive neuropsychological test results were available for a subsample of participants (940 MSR and 33 SSR). General linear models were used to investigate the effects of diagnosis, relationship, and NPI-Q scores on structural and cognitive outcomes.

Result: The MSR group presented with more impairments. Diagnosis-by-relationship interaction effects were observed for brain parameters: 1) CI-MSR had more atrophy in occipital, medio-temporal, and frontal areas; 2) CU-MSR had reduced volume/thickness in orbito-frontal, insular, and anterior cingulate cortices. The MSR groups had greater executive, memory, and language deficits. Neuropsychiatric symptom severity was negatively associated with volume and thickness of bilateral temporo-cingulate areas and total MMSE scores in the MSR groups only.

Conclusion: MSR older adults had greater cognitive and behavioral impairments compared to SSR older adults. CI-MSR had greater grey matter atrophy in areas particularly affected by AD (i.e., medio-temporal regions). Our results suggest that SM older
adults may present with less neurocognitive impairment on comprehensive assessment, despite previous evidence of subjective complaints. Further investigations are needed to clarify factors influencing cognitive decline in older SM.