



Blood lipids mediate the role of exercise on cognitive function in adults living with stroke? Secondary analysis of a 6-month RCT

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Introduction

- Having a stroke doubles the risk of dementia which significantly increases the risk of a recurrent stroke and mortality¹
- Stroke is associated with an increase in cognitive deficits² and cognitive deficit severity may vary by sex³
- Exercise (EX) and Social and Cognitive Enrichment (ENRICH) are promising, non-pharmacological, approaches to improving cognitive health post-stroke^{4,5}
- EX and ENRICH may promote cognitive health through changes in blood lipid composition⁶

Results

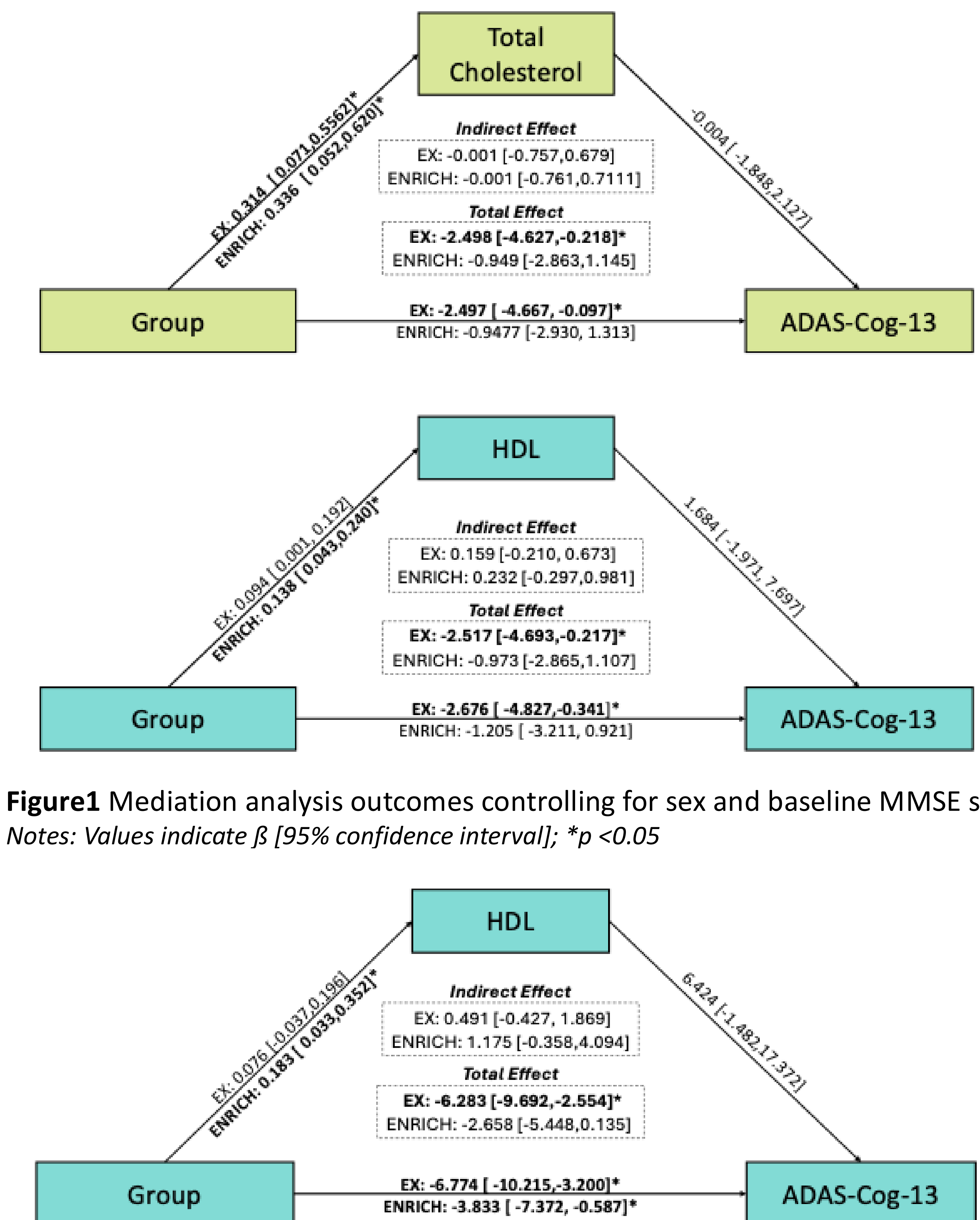
- Of the 120 participants, 77 participants had complete case ADAS-Cog 13 and blood lipid data and were included for analysis

Table 1 Baseline demographics

	BAT	Group ENRICH	EX
<i>Measure</i> ϕ	n=52	n=34	n=34
Age	70.42 (7.81)	71.29 (9.25)	70.65 (9.14)
Sex = Male	30 (57.7)	23 (67.6)	21 (61.8)
Height (cm)	166.21 (9.25)	170.20 (9.59)	166.31 (10.51)
Weight (kg)	77.96 (16.06)	79.95 (17.99)	75.94 (13.22)
BMI (kg/m ²)	28.11 (4.89)	27.32 (4.45)	27.37 (3.69)
Rest BP Systolic (mmHg)	131.54 (16.65)	132.12 (17.53)	134.35 (19.65)
Rest BP Diastolic (mmHg)	81.02 (9.40)	81.09 (11.98)	79.85 (12.67)
Education			
High School or Less	13 (25.0)	5 (14.7)	6 (17.6)
Trade School or Some College	18 (34.6)	8 (23.5)	10 (29.4)
University Degree or Higher	21 (40.4)	21 (61.8)	18 (52.9)
Months since stroke	62.12 (55.64)	68.74 (57.55)	70.91 (47.71)
Number of strokes	1.29 (0.72)	1.15 (0.50)	1.09 (0.29)
Stroke Type			
Hemorrhagic	15 (28.8)	10 (29.4)	8 (23.5)
Ischemic	33 (63.5)	18 (52.9)	22 (64.7)
Ischemic & Lacunar	1 (1.9)	0 (0.0)	0 (0.0)
Lacunar	1 (1.9)	3 (8.8)	3 (8.8)
Unknown	2 (3.8)	3 (8.8)	1 (2.9)
Stroke Hemisphere			
Bilateral	3 (5.8)	0 (0.0)	1 (2.9)
Left	31 (59.6)	14 (41.2)	16 (47.1)
Right	16 (30.8)	18 (52.9)	17 (50.0)
Unknown	2 (3.8)	2 (5.9)	0 (0.0)
MMSE (/30)	27.15 (2.40)	27.56 (2.52)	27.15 (2.56)
MoCA (/30)	21.69 (4.49)	22.82 (3.99)	21.26 (3.70)
ADAS-Cog 13 (/85)	17.19 (8.00)	16.42 (6.29)	18.16 (7.47)
<i>Blood Lipid Composition</i> ϕ	n=43	n=28	n=26
Total Cholesterol (mmol/L)	4.23 (0.94)	4.11 (1.19)	4.22 (1.09)
Triglycerides (mmol/L)	1.43 (0.61)	1.47 (1.11)	1.35 (0.66)
LDL cholesterol (mmol/L)	2.11 (0.82)	2.17 (1.01)	2.15 (1.07)
Non-HDL cholesterol (mmol/L)	2.94 (0.86)	2.87 (1.17)	2.90 (1.02)
HDL cholesterol (mmol/L)	1.47 (0.43)	1.35 (0.45)	1.46 (0.41)

Notes: ENRICH, cognitive and social activities group; BAT, balance and tone group; EX, exercise group BMI, Body Mass Index; CES-D, Center for Epidemiological Studies Depression Scale; MMSE, Mini Mental State Exam; MoCA, Montreal Cognitive Assessment; ADAS-Cog 13, 13 item Alzheimer's Disease Assessment Scale Cognitive Assessment.
Higher scores indicate better performance: MMSE; MoCA
Higher scores indicate worse performance: ADAS-Cog 13, CES-D
 ϕ Values indicate mean (SD) or n (%)
 $\phi\phi$ Subset of individuals with lipid profile collected at baseline and 6-months

- EX significantly improved ADAS-Cog-13 scores and both EX and ENRICH increased total cholesterol ENRICH also increased HDL. No indirect mediation effects were observed (Figure 2).
- There were no direct or indirect mediation effects for males. ENRICH increased HDL among females. No indirect mediation effects were observed (Figure 2).



Conclusions

- Blood lipid composition did not mediate changes in cognitive function in either EX or ENRICH vs. BAT
- EX and ENRICH may promote cognitive function through alternative pathways

References

- Donkor(2018)Stroke Res Treat. 2 Patel et al.(2002)J Am Geriatr Soc. 3 Gall et al.(2018)Stroke. 4 Liu-Ambrose et al.(2022)JAMA Network Open. 5 Oberlin et al.(2017)Stroke. 6 Smart et al.(2025)Sports Med.