

Supplementary Material

Effects of Remote Expressive Arts Program in Older Adults with Mild Cognitive Impairment: A Randomized Controlled Trial

Supplementary Table 1. Sessions of remote expressive arts program

Session name	Theme	Structure	Main materials
Session 1: Wild Scenery	Historical nostalgia	Structured	In16k paper, pastels, color pencil, scissors, eraser
Session 2: Sunflowers in summer	Realistic orientation	Structured	In16k paper, pastels, pencil, scissors, eraser
Session 3: Paper-rolling card	General themes	Structured	In16k paper, paper roller, white latex, pen, paper-rolling pen
Session 4: Autumn Chrysanthemum	Realistic orientation	Structured	In16k paper, paper roller, white latex, pen, paper-rolling pen
Session 5: Botanic Kingdom	General themes	Structured	Clay, paper disc, Clay sculpting knife
Session 6: Underwater world	General themes	Structured	Clay, paper disc, Clay sculpting knife
Session 7: Street Corner	Realistic orientation	Structured	In16k paper, color pencil
Session 8: Mid-Autumn Festival	Historical nostalgia	Structured	In16k black thick paper, In16k paper, watercolor, brush, glue, scissors
Session 9: National Day	Historical nostalgia	Structured	In16k colored thick paper, glue, scissors, paper-rolling pen, paper roller
Session 10: Urban Night	Realistic orientation	Structured	In16k paper, color pencil
Session 11: Jiangnan Impression	Realistic orientation	Structured	paper disc, watercolor, brush
Session 12: Reflection in Water	General themes	Structured	In16k paper, watercolor, brush
Session 13: Four seasons	General themes	Structured	In16k paper, Oil pastels, watercolor, brush
Session 14: Meaningful seasons	Historical nostalgia	Semi-structured	In16k paper, independent selection of other media
Session 15: Fairy World	Guided imagery	Semi-structured	Clay, paper disc, Clay sculpting knife
Session 16: Imaginary Creature	Guided imagery	Semi-structured	In16k paper, watercolor, brush
Session 17: Wonderland	Guided imagery	Semi-structured	In16k paper, Oil pastels
Session 18: Microscopic View	Guided imagery	Semi-structured	In16k paper, independent selection of other media

Session 19: The Moral of the Fish	Historical nostalgia	Semi-structured	In16k paper, paper roller, white latex, paper-rolling pen, independent selection of other media
Session 20: Dress Production	General themes	Semi-structured	In16k paper, paper roller, white latex, paper-rolling pen, independent selection of other media
Session 21: Primitive Tribe	Historical nostalgia	Semi-structured	In16k paper, pastels, color pencil
Session 22: Word Association	Guided imagery	Semi-structured	In16k paper, independent selection of other media
Session 23: Random Selection	Guided imagery	Semi-structured	In16k paper, independent selection of other media
Session 24: Window Scenery	Realistic orientation	Semi-structured	In16k paper, independent selection of other media

Supplementary Table 2. Analysis of covariance for between-group comparisons posttreatment in naMCI subgroup

Variables	rEAP(n=27)		HE(n=19)		<i>p</i> *	<i>p</i> FDR correction
	Before	After	Before	After		
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)		
MoCA	23.1 (2.4)	25.5 (2.1)	22.8 (2.2)	23.6 (2.2)	0.010	0.110
MMSE	27.3 (1.6)	28.3 (1.5)	27.3 (1.5)	27.3 (2.5)	0.044	0.242
AVLT						
Immediate-term	19.7 (5.3)	22.0 (5.5)	17.5 (4.2)	18.8 (5.1)	0.216	0.339
Long-term	5.9 (2.5)	7.8 (2.5)	5.5 (2.1)	6.1 (2.6)	0.079	0.290
Recall-term	22.3 (2.2)	22.6 (1.6)	22.3 (1.5)	22.1 (1.7)	0.516	0.568
VFT	17.6 (2.2)	18.0 (3.4)	16.6 (3.5)	16.2 (4.5)	0.394	0.542
BNT	22.2 (2.9)	23.4 (2.7)	21.3 (4.0)	21.4 (3.4)	0.079	0.217
STT						
STT-A	63.2 (14.1)	64.3 (26.1)	65.9 (14.8)	60.2 (15.5)	0.489	0.598
STT-B	160.9 (38.7)	144.1 (59.3)	159.1 (32.5)	147.2 (43.2)	0.869	0.869
SDMT	33.4 (7.5)	35.9 (9.3)	33.7 (7.0)	33.5 (8.0)	0.099	0.218
ADL	20.3 (0.5)	20.1 (0.4)	20.2 (0.5)	20.3 (0.7)	0.192	0.352

*Significance level of $\alpha = 0.05$ (two-tailed); Each analysis of covariance included age, sex, education, and respective baseline value as covariates.

MoCA, Montreal Cognitive Assessment; MMSE, Mini-Mental State Examination; AVLT, Auditory Verbal Learning Test; VFT, Verbal Fluency Test; BNT, Boston Naming Test; STT, Shape Trail Test; SDMT, Symbol Digit Modalities Test; ADL, Activities of Daily Living scale

Supplementary Table 3. Analysis of covariance for between-group comparisons posttreatment in aMCI subgroup

Variables	rEAP(n=11)		HE(n=16)		<i>p</i> *	<i>p</i> FDR correction
	Before Mean (SD)	After Mean (SD)	Before Mean (SD)	After Mean (SD)		
MoCA	21.4 (3.5)	23.3 (3.6)	20.2 (3.3)	21.9 (3.0)	0.469	>0.999
MMSE	25.5 (2.2)	26.7 (2.0)	25.9 (1.8)	26.0 (2.4)	0.558	>0.999
AVLT						
Immediate-term	13.4 (3.6)	15.4 (6.4)	11.9 (3.8)	14.4 (2.9)	0.850	0.935
Long-term	1.6 (1.4)	4.1 (2.7)	1.3 (1.1)	3.3 (2.9)	0.839	>0.999
Recall-term	19.4 (3.1)	21.4 (1.9)	18.3 (2.8)	19.1 (3.1)	0.028	0.308
VFT	15.5 (3.8)	15.5 (5.4)	14.3 (4.4)	13.3 (2.7)	0.394	>0.999
BNT	22.5 (3.5)	22.7 (3.6)	18.8 (4.2)	20.3 (2.7)	0.581	0.913
STT						
STT-A	61.2 (16.2)	61.5 (26.0)	82.9 (22.7)	82.7 (16.6)	0.092	0.337
STT-B	170.7 (55.0)	158.5 (58.4)	217.2 (69.3)	181.9 (47.1)	0.878	0.878
SDMT	30.5 (11.3)	32.2 (10.3)	24.4 (7.4)	23.9 (6.7)	0.076	0.418
ADL	20.7 (1.3)	20.1 (0.3)	20.4 (0.8)	20.1 (0.3)	0.847	>0.999

*Significance level of $\alpha = 0.05$ (two-tailed); Each analysis of covariance included age, sex, education, and respective baseline value as covariates.

MoCA, Montreal Cognitive Assessment; MMSE, Mini-Mental State Examination; AVLT, Auditory Verbal Learning Test; VFT, Verbal Fluency Test; BNT, Boston Naming Test; STT, Shape Trail Test; SDMT, Symbol Digit Modalities Test; ADL, Activities of Daily Living scale

Supplementary Table 4. Correlations between altered neuroimaging indexes and changes in neuropsychological test scores among naMCI subgroup

Indicators	Group	ReHo (Frontal_Sup_L)		ReHo (Cingulum_Ant_R)		PCC-RMTG		vmPFC-LAG	
		r	p	r	p	r	p	r	p
		MoCA	rEAP	0.254	0.293	0.138	0.574	-0.151	0.538
	HE	-0.107	0.717	0.255	0.380	-0.086	0.769	0.255	0.379
MMSE	rEAP	0.042	0.865	0.151	0.536	-0.175	0.473	-0.266	0.270
	HE	-0.137	0.641	-0.150	0.609	0.303	0.293	0.432	0.123
AVLT									
Immediate-term	rEAP	0.076	0.756	-0.176	0.472	-0.075	0.760	0.128	0.601
	HE	0.091	0.757	0.213	0.464	-0.209	0.474	-0.356	0.211
Long-term	rEAP	0.416	0.077	0.083	0.735	-0.494	0.031	-0.258	0.287
	HE	0.427	0.128	0.029	0.922	-0.222	0.445	-0.034	0.909
Recall-term	rEAP	-0.032	0.898	0.105	0.668	0.026	0.915	0.192	0.431
	HE	0.007	0.981	-0.372	0.191	-0.399	0.158	-0.264	0.362
VFT	rEAP	0.532	0.019	0.356	0.135	-0.329	0.169	-0.266	0.271
	HE	0.043	0.885	-0.504	0.066	0.224	0.442	-0.552	0.040
BNT	rEAP	-0.075	0.760	0.311	0.195	-0.448	0.054	-0.314	0.190
	HE	0.411	0.144	0.013	0.965	-0.101	0.731	0.064	0.827
STT									
STT-A	rEAP	-0.488	0.034	-0.138	0.572	-0.094	0.701	-0.097	0.691
	HE	-0.637	0.014	-0.333	0.245	-0.069	0.815	0.086	0.769
STT-B	rEAP	-0.182	0.456	-0.246	0.309	0.253	0.297	0.100	0.684
	HE	0.225	0.438	0.287	0.320	-0.239	0.411	0.038	0.897
SDMT	rEAP	0.049	0.843	0.190	0.437	-0.268	0.267	-0.206	0.397
	HE	0.020	0.946	0.196	0.503	-0.056	0.848	0.079	0.787

MoCA, Montreal Cognitive Assessment; MMSE, Mini-Mental State Examination; AVLT, Auditory Verbal Learning Test; VFT, Verbal Fluency Test; BNT, Boston Naming Test; STT, Shape Trail Test; SDMT, Symbol Digit Modalities Test; ADL, Activities of Daily Living Scale; Cingulum_Ant_R, right anterior cingulate/paracingulate cortex; Frontal_Sup_L, left dorsolateral superior frontal gyrus; RMTG, right middle temporal gyrus; LAG, left angular gyrus

Supplementary Table 5. Correlations between altered neuroimaging indexes and changes in neuropsychological test scores among aMCI subgroup

Indicators	Group	ReHo (Frontal_Sup_L)		ReHo (Cingulum_Ant_R)		PCC-RMTG		vmPFC-LAG	
		r	p	r	p	r	p	r	p
MoCA	rEAP	0.732	0.098	0.740	0.092	-0.653	0.160	-0.323	0.533
	HE	0.060	0.888	0.636	0.090	-0.234	0.578	-0.127	0.764
MMSE	rEAP	0.827	0.042	0.887	0.018	-0.394	0.440	-0.163	0.758
	HE	0.800	0.017	0.372	0.364	-0.138	0.744	0.704	0.052
AVLT									
Immediate-term	rEAP	-0.136	0.797	-0.322	0.534	0.445	0.377	0.211	0.688
	HE	0.376	0.359	-0.158	0.709	0.147	0.728	0.629	0.095
Long-term	rEAP	-0.486	0.329	-0.139	0.793	-0.089	0.866	-0.441	0.381
	HE	0.361	0.380	0.001	0.998	-0.161	0.703	0.466	0.245
Recall-term	rEAP	0.456	0.364	-0.229	0.662	0.123	0.817	0.352	0.494
	HE	-0.189	0.654	-0.370	0.367	0.461	0.251	0.373	0.363
VFT	rEAP	0.561	0.247	0.573	0.234	0.268	0.608	0.285	0.585
	HE	0.574	0.137	0.378	0.356	-0.402	0.323	-0.163	0.700
BNT	rEAP	-0.372	0.468	0.076	0.886	0.219	0.677	-0.051	0.923
	HE	0.435	0.281	-0.118	0.782	-0.151	0.722	0.727	0.041
STT									
STT-A	rEAP	0.036	0.945	0.570	0.238	-0.091	0.864	-0.232	0.658
	HE	0.696	0.055	0.071	0.867	-0.120	0.778	0.481	0.227
STT-B	rEAP	-0.261	0.617	-0.019	0.972	-0.743	0.090	-0.858	0.029
	HE	0.565	0.144	0.525	0.181	0.130	0.759	0.686	0.060
SDMT	rEAP	0.437	0.387	0.065	0.902	0.262	0.616	0.535	0.274
	HE	-0.808	0.015	-0.094	0.824	0.091	0.830	-0.227	0.589

MoCA, Montreal Cognitive Assessment; MMSE, Mini-Mental State Examination; AVLT, Auditory Verbal Learning Test; VFT, Verbal Fluency Test; BNT, Boston Naming Test; STT, Shape Trail Test; SDMT, Symbol Digit Modalities Test; ADL, Activities of Daily Living Scale; Cingulum_Ant_R, right anterior cingulate/paracingulate cortex; Frontal_Sup_L, left dorsolateral superior frontal gyrus; RMTG, right middle temporal gyrus; LAG, left angular gyrus