ATTIVITA' MOTORIA E DETERIORAMENTO COGNITIVO NELL'ANZIANO

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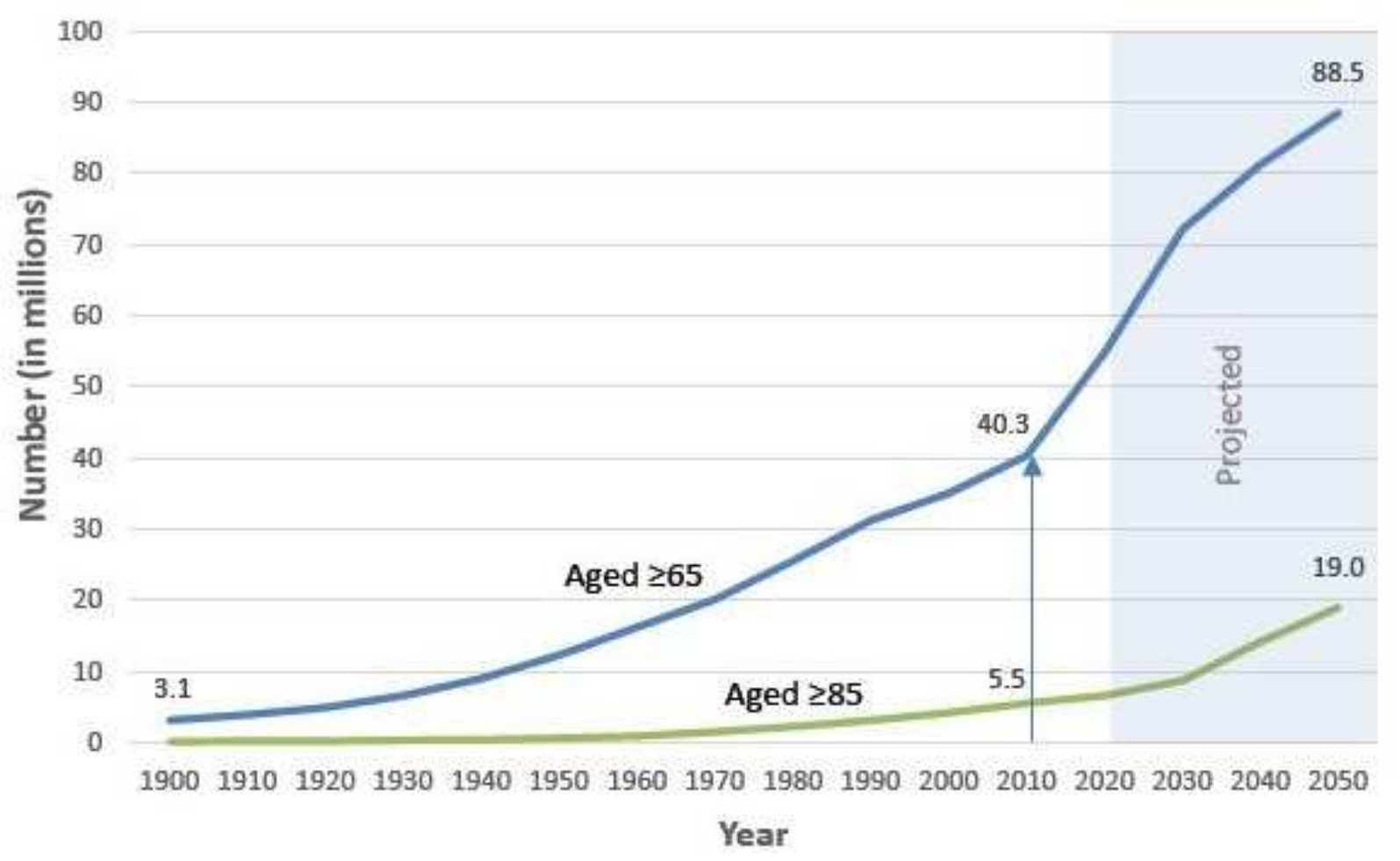
LA NUOVA DEFINIZIONE DELLE CLASSI DI ETÀ

0-10	• Bambini
11-20	• Adolescenti
21-25	• Giovani
26-35	• Giovani adulti
36-54	• Adulti
55-64	• Tardo adulti
65-74	• Giovani anziani
75-84	• Anziani
85 e più	• Grandi anziani

LA POPOLAZIONE INVECCHIA



Physical activity and health outcomes: Chief Medical Officer's Report At least 5 a week (2004)

www.dh.gov.uk/publications

	PREVENTION		THERAPY	
	Evidence	Effect	Evidence	Effect
CHD	High	Strong	Medium	Moderate
Stroke	High	Moderate	Low	Weak
Obesity	Medium	Moderate	Medium	Moderate
Cancer	Medium	Moderate	Low	Moderate
Diabetes	High	Strong	Medium	Weak
Musculo-skeletal	Medium	Moderate	Medium	Moderate
Mental health	Medium	Moderate	Medium	Moderate

DISTURBI MENTALI COMUNI NELLA PERSONA ANZIANA

- Depressione
- Apatia
- Ansia
- Abuso di alcool e farmaci
- Disturbi del sonno
- Stanchezza cronica
- Disturbi somatici inspiegabili
- Disturbi del comportamento
- Psicosi
- Decadimento cognitivo e demenza

DEMENZA

Definizione

Graduale e progressivo decadimento delle funzioni mentali, quali memoria, critica, giudizio, ragionamento, espressione di una sofferenza organica diffusa o, più raramente, focale, dell'encefalo, e di entità tale da interferire con le normali attività lavorative e sociali del paziente.

ATTIVITA' MOTORIA E DETERIORAMENTO COGNITIVO

- Prevenzione
- Terapia
- Effetti aberranti

ATTIVITA' MOTORIA E DETERIORAMENTO COGNITIVO

- Prevenzione

Tab. I. Associazione tra esercizio fisico e funzione cognitiva: risultati dai principali studi osservazionali.

Studio	Anno	N	Età (anni)	Misure attività fisica	Follow-up (anni)	Misure funzione cognitiva	Associazioni rilevate
Albert et al. [51], USA	1995	1.011	70-79	Attività fisica	2-3	Batteria Neuropsicologica (linguaggio, memoria, concettualizzazione, abilità visuo-spaziale)	Attività fisica intensa associata a preservazione della funzione cognitiva
Carmelli et al. [52], USA	1997	566	65-86	Attività fisica *self-reported*	6	Declino nella memoria a breve termine, fluenza verbale, e abilità visuo-spaziale	Scarsa attività fisica associata a declino cognitivo
Hultsch et al., [53] Canada	1999	250	55-86	Attività sociali e attività fisica	6	Declino nella funzione cognitiva (memoria, comprensione e velocità)	Nessuna associazione tra attività fisica e funzione cognitiva
Yaffe et al. [12], USA	2001	5.925	> 65	Attività fisiche di bassa, media e elevata intensità	6-8	Declino nella funzione cognitiva complessiva misurata al MMSE	Attività fisica di intensità media ed elevata associata a riduzione del declino cognitivo
Schuit et al. [54], Olanda	2001	347	Media = 74,6	Tempo di attività fisica quotidiana (media o alta intensità)	3	Declino nella funzione cognitiva complessiva misurata al (MMSE test)	Scarsa attività fisica quotidiana associata con più elevato declino cognitivo solo in soggetti con allele APOE e4
Ho et al. [55], Cina	2001	2.030	> 70	Attività fisica self-reported (si o no)	3	Funzione cognitiva complessiva (CAPE test)	Nessuna associazione tra attività fisica e declino cognitivo
Bosma et al. [56], Olanda	2002	830	49-81	Esercizio fisico, attività cognitive e sociali (ore/ settimana)	3	Memoria e fluenza verbale; funzione cognitiva complessiva misurata al MMSE	Tutte e tre le attività associate a ridotto declino cognitivo
Van Gelder et al. [57], Finlandia, Olanda, Italia	2004	295	Media = 74,6	Tempo giornaliero d'attività fisica (media o alta intensità)	10	Declino nella funzione cognitiva complessiva misurata al MMSE test	Più scarsa attività fisica associata a maggior declino cognitivo
Weuve et al. [58], USA	2004	18.766	70-81	Attività fisiche di vario genere; cammino (attività espressa in equivalenti metabolici)	2	Funzione cognitiva complessiva (TICS); memoria; attenzione; fluenza verbale	Attività fisica associata a migliore funzione cognitiva e minor declino cognitivo

C. Maraldi
M. Pahor,
Giornale di
Gerontologia
2006

Physical activity in relation to cognitive decline in elderly men

The FINE Study

B.M. van Gelder, MSc; M.A.R. Tijhuis, PhD; S. Kalmijn, MD, PhD; S. Giampaoli, MD;
A. Nissinen, MD, PhD; and D. Kromhout, PhD

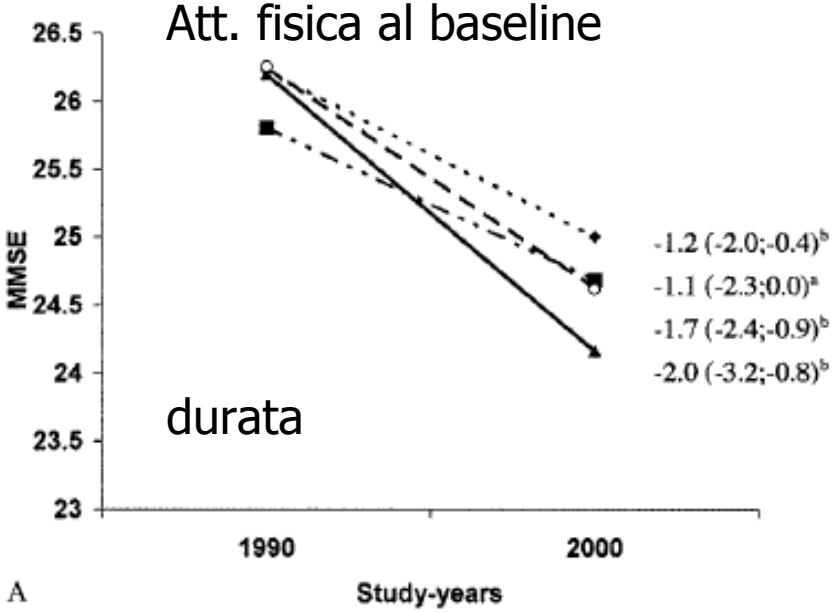
Abstract—*Background:* Physical activity may be associated with better cognition. *Objective:* To investigate whether change in duration and intensity of physical activity is associated with 10-year cognitive decline in elderly men. *Methods:* Data of 295 healthy survivors, born between 1900 and 1920, from the Finland, Italy, and the Netherlands Elderly (FINE) Study were used. From 1990 onward, physical activity was measured with a validated questionnaire for retired men and cognitive functioning with the Mini-Mental State Examination (maximum score 30 points). *Results:* The rates of cognitive decline did not differ among men with a high or low duration of activity at baseline. However, a decrease in activity duration of >60 min/day over 10 years resulted in a decline of 1.7 points ($p < 0.0001$). This decline was 2.6 times stronger than the decline of men who maintained their activity duration ($p = 0.06$). Men in the lowest intensity quartile at baseline had a 1.8 ($p = 0.07$) to 3.5 ($p = 0.004$) times stronger 10-year cognitive decline than those in the other quartiles. A decrease in intensity of physical activity of at least half a standard deviation was associated with a 3.6 times stronger decline than maintaining the level of intensity ($p = 0.003$). *Conclusions:* Even in old age, participation in activities with at least a medium-low intensity may postpone cognitive decline. Moreover, a decrease in duration or intensity of physical activity results in a stronger cognitive decline than maintaining duration or intensity.

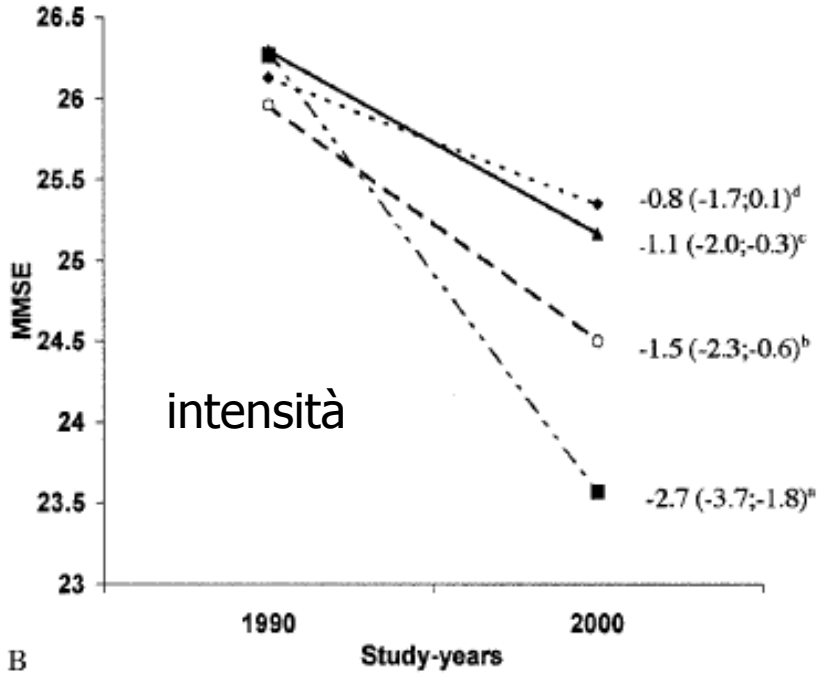
NEUROLOGY 2004;63:2316–2321

Attività fisica riferita: frequenza, durata, velocità di cammino e in bicicletta, tempo trascorso in hobby e giardinaggio, in lavori occasionali e sport → 4 gruppi

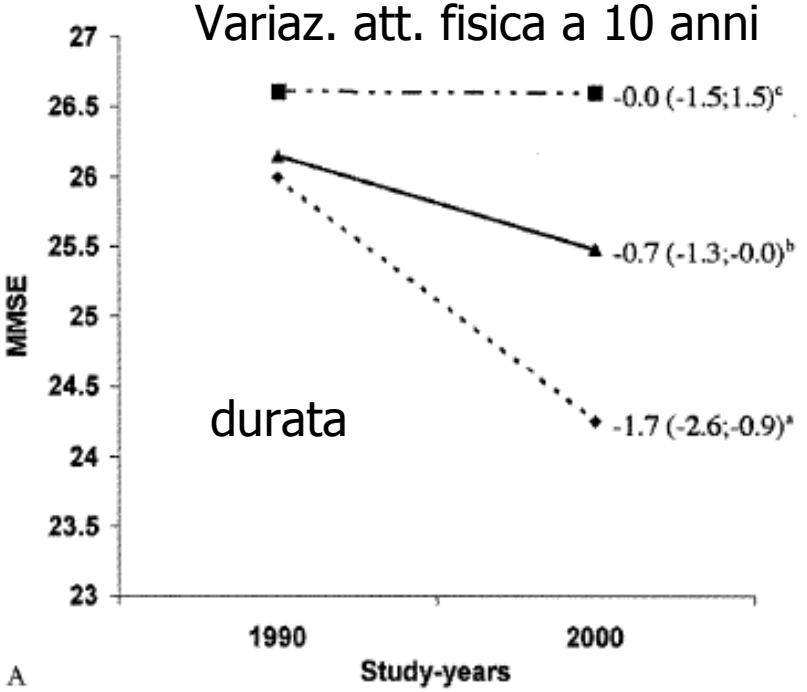
Cognitività: MMSE

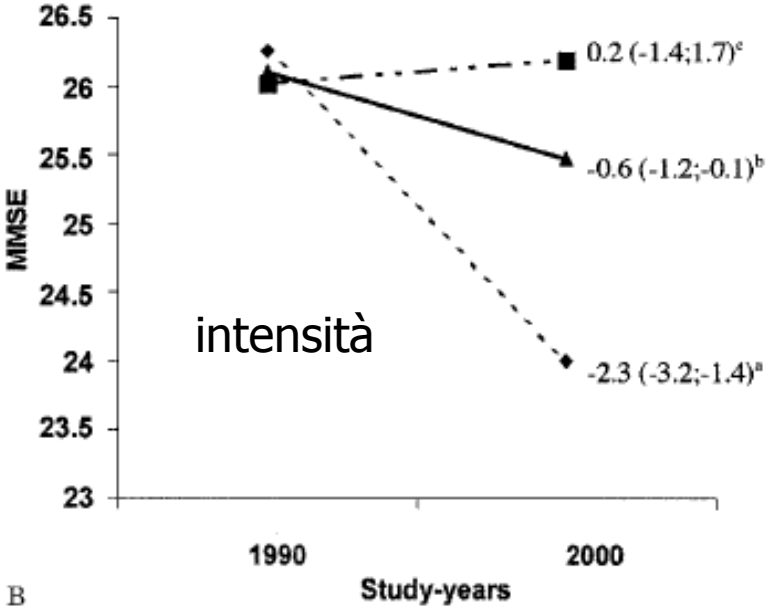
Att. fisica al baseline





Variaz. att. fisica a 10 anni





ORIGINAL INVESTIGATION

Physical Activity and Incident Cognitive Impairment in Elderly Persons

The INVADE Study

Thorleif Etgen, MD; Dirk Sander, MD; Ulrich Huntgeburth, MD; Holger Poppert, MD; Hans Förstl, MD; Horst Bickel, PhD

Background: Data regarding the relationship between physical activity and cognitive impairment are limited and controversial. We examined whether physical activity is associated with incident cognitive impairment during follow-up.

Methods: As part of a community-based prospective cohort study in southern Bavaria, Germany, 3903 participants older than 55 years were enrolled between 2001 and 2003 and followed up for 2 years. Physical activity (classified as no activity, moderate activity [<3 times/wk], and high activity [≥3 times/wk]), cognitive function (assessed by the 6-Item Cognitive Impairment Test), and potential confounders were evaluated. The main outcome measure was incident cognitive impairment after 2 years of follow-up.

Results: At baseline, 418 participants (10.7%) had cognitive impairment. After a 2-year follow-up, 207 of 3485 initially unimpaired subjects (5.9%) developed incident cognitive impairment. Compared with participants without physical activity, fully adjusted multiple logistic regression analysis showed a significantly reduced risk of incident cognitive impairment after 2 years for participants with moderate or high physical activity at baseline (odds ratio [OR], 0.57; 95% confidence interval [CI], 0.37-0.87 [*P*=.01]; and OR, 0.54; 95% CI, 0.35-0.83 [*P*=.005]; respectively). Further subanalysis including participants (n=2029) without functional impairment and without prodromal phase of dementia resulted in an even higher reduction of risk of incident cognitive impairment for participants with moderate or high physical activity (OR, 0.44; 95% CI, 0.24-0.83 [*P*=.01]; and OR, 0.46; 95% CI, 0.25-0.85 [*P*=.01]; respectively) compared with no activity.

Conclusion: Moderate or high physical activity is associated with a reduced incidence of cognitive impairment after 2 years in a large population-based cohort of elderly subjects.

Arch Intern Med. 2010;170(2):186-193

Attività fisica riferita: numero di giorni/settimana in cui veniva praticata attività (camminare, escursionismo, andare in bicicletta, nuotare, fare giardinaggio, altro esercizio) → 3 gruppi

Cognitività: 6-Item Cognitive Impairment Test

Table 3. Cross-sectional Association of Physical Activity at Baseline and Cognitive Impairment at Baseline

Model	No Activity	Moderate Activity	*P* Value	High Activity	*P* Value
Unadjusted					
OR (95% CI)	1 [Reference]	0.43 (0.33-0.56)	<.001	0.29 (0.22-0.38)	<.001
No. cognitively impaired[a]/sample size, No. (%)	125/584 (21.4)	160/1523 (10.5)		132/1796 (7.3)	
Adjusted for age and sex					
OR (95% CI)	1 [Reference]	0.50 (0.38-0.65)	<.001	0.37 (0.28-0.49)	<.001
No. cognitively impaired[a]/sample size, No. (%)	125/584 (21.4)	160/1523 (10.5)		132/1796 (7.3)	

Table 6. Association of Incident Cognitive Impairment With Physical Activity at Baseline for Participants Without Baseline Functional Impairment[a] and With a Baseline 6CIT Score Lower Than the 75th Percentile[b]

Model	No Activity	Moderate Activity	*P* Value	High Activity	*P* Value
Unadjusted					
OR (95% CI)	1 [Reference]	0.49 (0.28-0.87)	.01	0.40 (0.23-0.70)	.001
No. cognitively impaired[c]/sample size, No. (%)	19/214 (8.9)	38/835 (4.6)		45/1197 (3.8)	
Adjusted for age and sex					
OR (95% CI)	1 [Reference]	0.51 (0.28-0.91)	.02	0.45 (0.25-0.80)	.006
No. cognitively impaired[c]/sample size, No. (%)	19/214 (8.9)	38/835 (4.6)		45/1197 (3.8)	
Fully adjusted[d]					
OR (95% CI)	1 [Reference]	0.44 (0.24-0.83)	.01	0.46 (0.25-0.85)	.01
No. cognitively impaired[c]/sample size, No. (%)	19/195 (9.7)	30/738 (4.1)		41/1096 (3.7)	

Abbreviations: 6CIT, 6-Item Cognitive Impairment Test; CI, confidence interval; OR, odds ratio.
[a] "Without functional impairment" was defined by a Barthel Index score of 100 and Modified Rankin Scale score of 0.
[b] 6CIT score of 0 to 4.
[c] Number of participants with incident cognitive impairment (6CIT score >7).
[d] Adjusted for age, sex, body mass index, baseline 6CIT score, depression, alcohol, diabetes, history of ischemic heart disease and/or stroke, hyperlipidemia, hypertension, chronic kidney disease, and smoking.

Fully adjusted[b]					
OR (95% CI)	1 [Reference]	0.57 (0.37-0.87)	.01	0.54 (0.35-0.83)	.005
No. cognitively impaired[a]/sample size, No. (%)	48/343 (14.0)	65/1024 (6.3)		70/1364 (5.1)	

Abbreviations: CI, confidence interval; OR, odds ratio.
[a] Number of participants with baseline cognitive impairment (6-Item Cognitive Impairment Test [6CIT] score >7).
[b] Adjusted for age, sex, body mass index, baseline 6CIT score, depression, alcohol, diabetes, history of ischemic heart disease and/or stroke, hyperlipidemia, hypertension, chronic kidney disease, and smoking.

Total daily physical activity and the risk of AD and cognitive decline in older adults

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ABSTRACT

Objective: Studies examining the link between objective measures of total daily physical activity and incident Alzheimer disease (AD) are lacking. We tested the hypothesis that an objective measure of total daily physical activity predicts incident AD and cognitive decline.

Methods: Total daily exercise and nonexercise physical activity was measured continuously for up to 10 days with actigraphy (Actical®; Philips Healthcare, Bend, OR) from 716 older individuals without dementia participating in the Rush Memory and Aging Project, a prospective, observational cohort study. All participants underwent structured annual clinical examination including a battery of 19 cognitive tests.

Results: During an average follow-up of about 4 years, 71 subjects developed clinical AD. In a Cox proportional hazards model adjusting for age, sex, and education, total daily physical activity was associated with incident AD (hazard ratio = 0.477; 95% confidence interval 0.273–0.832). The association remained after adjusting for self-report physical, social, and cognitive activities, as well as current level of motor function, depressive symptoms, chronic health conditions, and *APOE* allele status. In a linear mixed-effect model, the level of total daily physical activity was associated with the rate of global cognitive decline (estimate 0.033, SE 0.012, $p = 0.007$).

Conclusions: A higher level of total daily physical activity is associated with a reduced risk of AD. ***Neurology*® 2012;78:1323–1329**

Attività fisica misurata con actigrafo montato sul braccio non dominante: variabile continua

Cognitività: batteria di 19 test cognitivi

Figure 1 Total daily physical activity over 10 consecutive days

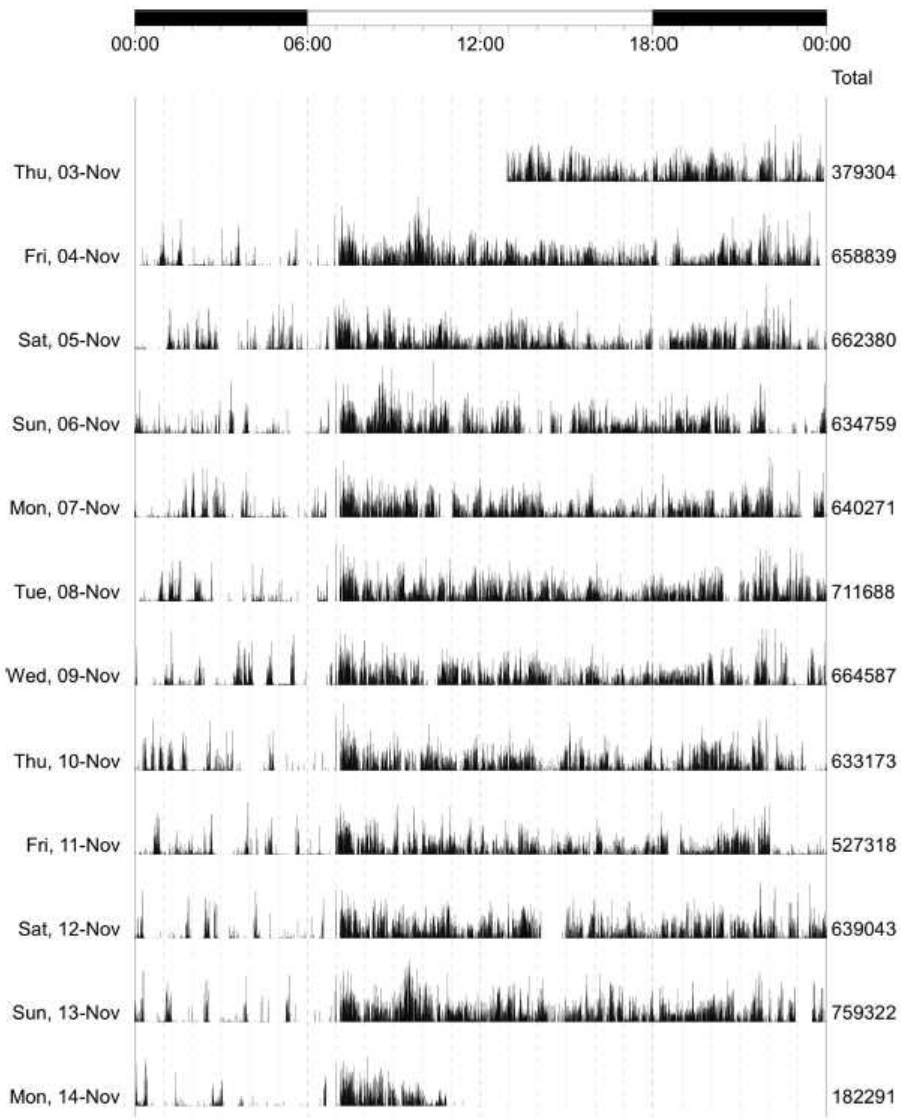
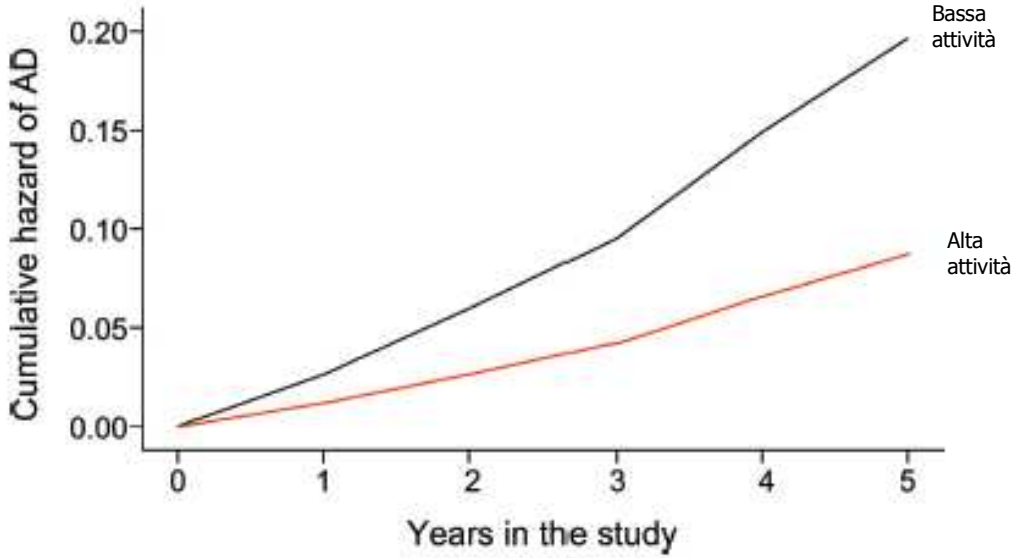


Table 2 Total daily physical activity and incident AD[a]

Terms	Model A, HR (95% CI), estimate (SE, p value)	Model B, HR (95% CI), estimate (SE, p value)	Model C, HR (95% CI), estimate (SE, p value)
Total daily	0.477 (0.273, 0.832)	0.437 (0.243, 0.787)	0.528 (0.293, 0.951)
Physical activity	−0.741 (0.284, 0.009)	−0.828 (0.300, 0.006)	−0.639 (0.300, 0.033)
Self-report		1.016 (0.937, 1.102)	1.041 (0.961, 1.126)
Physical activity			
Self-report			
Social activity			
Self-report			
Cognitive activity			

Abbreviations: AD = Alzheimer dis
[a] Three separate discrete-time Co
risk of AD. All 3 models also includ
not shown.

Figure 2 Total daily physical activity and risk of AD in old age



Expected risk of Alzheimer disease (AD) based on the entire cohort is illustrated for 2 hypothetical average participants with high (dotted line: 90th percentile, 4.90×10^5 activity counts per day) and low levels (solid line: 10th percentile, 1.24×10^5 activity counts per day) of total daily physical activity.

ORIGINAL RESEARCH

American Heart Association | American Stroke Association

Ideal Cardiovascular Health and Cognitive Aging in the Northern Manhattan Study

Hannah Gardener, ScD; Clinton B. Wright, MD, MS; Chuanhui Dong, PhD; Ken Cheung, PhD; Janet DeRosa, MPH; Micaela Nannery; Yaakov Stern, PhD; Mitchell S. V. Elkind, MD, MS; Ralph L. Sacco, MD, MS

***Background*—**The American Heart Association defined target levels for 7 cardiovascular health (CVH) factors: smoking, body mass index, physical activity, diet, blood pressure, cholesterol, and glucose. We hypothesized that a greater number of American Heart Association ideal CVH metrics would be associated with less decline in cognitive performance in our multiethnic population.

***Methods and Results*—**A subsample from the population-based Northern Manhattan Study underwent repeated neuropsychological testing (mean interval 6±2 years). Domain-specific *Z* scores were derived by using factor analysis for the domains of Episodic Memory, Semantic Memory, Executive Function, and Processing Speed, based on initial performance and decline over time. Linear regression models were constructed to examine the relationship between the number of ideal CVH metrics at enrollment with later cognitive performance and decline, adjusting for sociodemographics and magnetic resonance imaging brain markers. Among 1033 participants (mean age at initial cognitive assessment 72±8 years, 39% male, 19% black, 16% white, 65% Hispanic; n=722 with repeat testing), 3% had 0 ideal factors, 15% had 1 factor, 33% had 2 factors, 30% had 3 factors, 14% had 4 factors, 4% had 5 factors, 1% had 6 factors, and 0% had 7 factors. An increasing number of ideal CVH factors was associated with better processing speed at initial assessment and less decline. The association was driven by nonsmoking and glucose. Among those with better cognitive performance at initial assessment, positive associations were observed between the number of ideal CVH factors and less decline in the domains of Executive Function and Episodic Memory.

Conclusions*—**The number of ideal CVH metrics was associated with less decline in the domains of Processing Speed and, to a lesser extent, of Executive Function and Episodic Memory. Ideal CVH promotion benefits brain health and cognitive aging. (J Am Heart Assoc.*** **2016;5:e002731 doi: 10.1161/JAHA.115.002731)**

Key Words: blood pressure • epidemiology • glucose • risk factors • smoking

Attività fisica riferita: considerata ideale se ≥150 minuti/settimana di intensità moderata o ≥75 minuti/settimana di intensità elevata, o combinazione equivalente

Cognitività: valutazione di 4 domini

Table 4. Ideal CVH in Relation to Change in Cognitive Performance (N=722)

	Change in Executive Function Z Score		Change in Semantic Memory Z Score		Change in Episodic Memory Z Score		Change in Processing Speed Z Score	
Ideal CVH*	β (SE)	*P* Value	β (SE)	*P* Value	β (SE)	*P* Value	β (SE)	*P* Value
No. of ideal factors, continuous								
Model 1†	0.055 (0.033)	0.098	0.037 (0.033)	0.250	0.064 (0.033)	0.060	0.122 (0.033)	<0.001
Model 2‡	0.060 (0.033)	0.080	0.031 (0.033)	0.350	0.061 (0.033)	0.060	0.120 (0.033)	<0.001
Model 1 among Hispanics	0.019 (0.043)	0656	0.007 (0.041)	0.872	0.063 (0.044)	0.147	0.126 (0.041)	0.002
No. of ideal factors								
Model 1								
2 vs 0–1	0.049 (0.108)	0.653	0.153 (0.107)	0.153	0.240 (0.108)	0.027	0.282 (0.106)	0.008
3 vs 0–1	0.270 (0.109)	0.014	0.182 (0.108)	0.091	0.285 (0.109)	0.009	0.386 (0.128)	0.004
4–7 vs 0–1	0.082 (0.124)	0.511	0.143 (0.123)	0.242	0.258 (0.124)	0.037	0.410 (0.122)	0.001
Model 2								
2 vs 0–1	0.061 (0.109)	0.575	0.153 (0.107)	0.151	0.240 (0.107)	0.026	0.286 (0.107)	0.008
3 vs 0–1	0.284 (0.110)	0.010	0.175 (0.108)	0.105	0.274 (0.109)	0.012	0.388 (0.108)	<0.001
4–7 vs 0–1	0.093 (0.125)	0.456	0.119 (0.123)	0.332	0.245 (0.123)	0.047	0.402 (0.123)	0.001
Blood pressure ideal								
Model 1	0.000 (0.151)	0.999	0.080 (0.150)	0.592	0.149 (0.152)	0.327	0.217 (0.149)	0.145
Model 2	0.003 (0.153)	0.986	0.030 (0.150)	0.841	0.136 (0.152)	0.370	0.189 (0.150)	0.208
BMI ideal								
Model 1	0.079 (0.088)	0.372	−0.086 (0.088)	0.330	−0.085 (0.089)	0.341	0.095 (0.087)	0.279
Model 2	0.080 (0.089)	0.371	−0.075 (0.087)	0.395	−0.072 (0.089)	0.417	0.103 (0.088)	0.240
Total cholesterol ideal								
Model 1	0.062 (0.078)	0.430	0.128 (0.077)	0.099	0.101 (0.078)	0.197	−0.002 (0.077)	0.974
Model 2	0.067 (0.079)	0.394	0.111 (0.077)	0.151	0.084 (0.078)	0.284	−0.010 (0.077)	0.893
Smoking ideal								
Model 1	−0.019 (0.094)	0.842	0.117 (0.092)	0.207	0.132 (0.093)	0.160	0.187 (0.092)	0.042
Model 2	−0.011 (0.094)	0.911	0.113 (0.092)	0.220	0.132 (0.093)	0.156	0.189 (0.092)	0.041
Physical activity ideal								
Model 1	0.081 (0.085)	0.337	0.028 (0.084)	0.740	−0.040 (0.086)	0.637	0.141 (0.084)	0.093
Model 2	0.083 (0.085)	0.332	0.023 (0.084)	0.781	−0.048 (0.085)	0.572	0.140 (0.084)	0.096
Fasting glucose ideal								
Model 1	0.060 (0.082)	0.466	−0.005 (0.081)	0.952	0.176 (0.082)	0.032	0.168 (0.080)	0.038
Model 2	0.057 (0.082)	0.418	−0.002 (0.081)	0.981	0.188 (0.081)	0.021	0.170 (0.081)	0.036
Diet ideal								
Model 1	1.243 (0.715)	0.083	0.274 (0.715)	0.702	−0.735 (0.719)	0.307	−0.420 (0.710)	0.554
Model 2	1.248 (0.717)	0.082	0.201 (0.712)	0.778	−0.811 (0.713)	0.255	−0.453 (0.711)	0.524

ALTRI STUDI

- Hitt, Neurology, 2010: camminare per almeno 6 miglia a settimana mantiene il volume cerebrale e protegge la memoria in età avanzata

- Gons et al, Neurology, 2013: l'attività fisica in pazienti con malattia dei piccoli vasi senza demenza mantiene l'integrità della sostanza bianca

- Tolppanen et al, Alzheimer's & Dementia, 2015: l'attività fisica nel tempo libero (LTPA) lieve e moderata nell'età media è associata a maggior rischio di demenza rispetto all'attività intensa

- Willey et al, Neurology, 2016: bassa o assente LTPA è lievemente associata a peggioramento delle funzioni esecutive, della memoria semantica e della velocità di elaborazione (con perdita di significatività quando aggiustata per i fattori di rischio vascolari)

POSSIBILI BIAS: attività fisica spesso self-reported e non dimostrata e disomogeneità di indicatori per declino cognitivo

POSSIBILI MECCANISMI

- L'esercizio fisico è associato ad un ridotto rischio di malattie cardiovascolari (ipertensione arteriosa, malattie cerebrovascolari, diabete mellito, obesità), a loro volta fattori di rischio di declino cognitivo e demenza

- L'esercizio fisico migliora la perfusione cerebrale (maggior espressione di VEGF)

- L'attività fisica è associata ad incremento di fattori neurotrofici importanti per la crescita e sopravvivenza neuronale (BDNF, serotonina, IGF-1), particolarmente nell'ippocampo

- L'attività fisica riduce lo stress ossidativo

- L'attività fisica è correlata ad una più corretta alimentazione

- L'attività fisica può migliorare i rapporti sociali

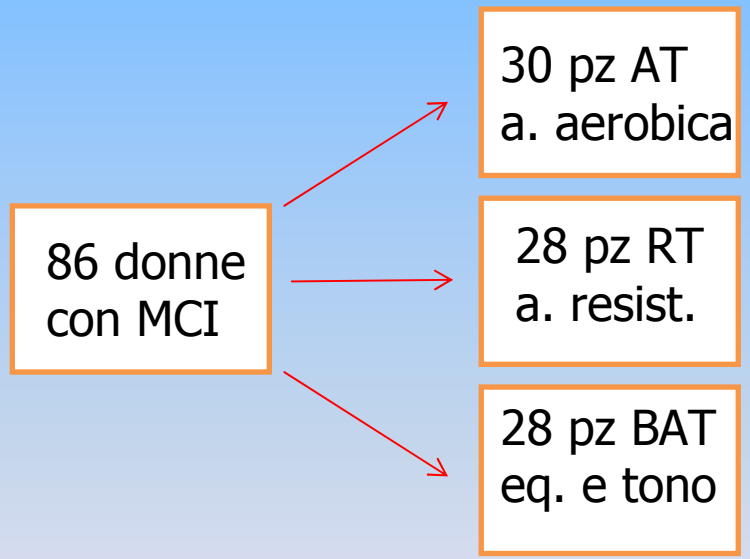
ATTIVITA’ MOTORIA E DETERIORAMENTO COGNITIVO

- Terapia

Aerobic exercise increases hippocampal volume in older women with probable mild cognitive impairment: a 6-month randomised controlled trial

Lisanne F ten Brinke,[1] Niousha Bolandzadeh,[2,3] Lindsay S Nagamatsu,[4] Chun Liang Hsu,[2,3] Jennifer C Davis,[5] Karim Miran-Khan,[6] Teresa Liu-Ambrose[2,3,6,7]

BJSM, 2014



PARAMETRI

Volume ippocampale (RMN)

Test di Rey (RAVLT)

Valutazioni al baseline (39 RMN) e a 6 mesi (77 pz, 29 RMN)

Table 2 Hippocampal volumes segmented from T1-weighted MRI using FSL FIRST (N=29)

Variable	AT (n=10) Mean (SD)	RT (n=8) Mean (SD)	BAT (n=11) Mean (SD)
Hippocampus volume baseline (mm^3)			
Left hippocampus	3158.20 (500.41)	3016.25 (528.93)	3003.64 (476.32)
Right hippocampus	3337.10 (656.34)	3189.50 (481.25)	3053.64 (638.16)
Total hippocampus	6495.30 (1072.08)	6205.75 (954.27)	6057.27 (1089.61)
Hippocampus volume 6 months (mm^3)			
Left hippocampus	3336.50 (454.99)*	3027.88 (468.76)	3027.73 (563.30)
Right hippocampus	3419.70 (539.57)*	3043.00 (564.82)	2923.64 (626.61)
Total hippocampus	6756.20 (952.25)*	6070.88 (974.35)	5951.36 (1117.94)
Hippocampal volume change (mm^3)			

Table 3 Scores for verbal memory and learning (Rey Auditory Visual Learning Test) (N=29)

Variables*	AT (n=10) Mean (SD)	RT (n=8) Mean (SD)	BAT (n=11) Mean (SD)
RAVLT baseline			
Total acquisition	7.56 (1.63)	8.38 (2.00)	7.33 (1.37)
Recall after interference	7.10 (3.25)	7.88 (2.64)	6.64 (2.46)
Loss after interference†	3.20 (1.62)	3.63 (2.45)	2.82 (2.32)
Long delay free recall	7.10 (3.38)	8.00 (2.00)	6.73 (2.83)
Recognition	12.70 (2.58)	13.25 (2.32)	13.45 (1.29)
RAVLT 6 months			
Total acquisition	8.16 (2.68)	9.68 (1.55)	8.04 (1.72)
Recall after interference	8.10 (3.35)	9.25 (2.60)	7.64 (3.29)
Loss after interference†	2.30 (1.16)	2.63 (1.92)	2.82 (1.99)
Long delay free recall	7.20 (4.34)	9.75 (3.24)	7.90 (3.31)‡
Recognition	13.30 (1.06)	13.14 (1.46)	13.73 (1.19) ‡
RAVLT change score			
Total acquisition	0.60 (2.28)	1.30 (1.79)	0.71 (1.29)
Recall after interference	1.00 (2.40)	1.38 (2.97)	1.00 (2.10)
Loss after interference†	−0.90 (1.60)	−1.00 (3.07)	0.00 (2.53)
Long delay free recall	0.10 (2.96)	1.75 (2.76)	0.80 (2.57) ‡
Recognition	0.60 (2.12)	−0.43 (2.70)§	0.27 (1.19)

*Higher score indicates better performance (except for *loss after interference*).
†Loss after interference calculated as trial 5 score minus trial 6 score.
‡n=11.
§n=7.
RAVLT, Rey Auditory Verbal Learning Test.

Exercise programs for people with dementia (Review)

Forbes D, Thiessen EJ, Blake CM, Forbes SC, Forbes S

THE COCHRANE COLLABORATION®

OBIETTIVO PRIMARIO

Può l'esercizio fisico migliorare la cognitività, le ADL, modulare i comportamenti e il tono dell'umore, incidere sulla mortalità in soggetti anziani con demenza?

Figure 4. Forest plot of comparison 1: Physical activity vs usual care: cognition

Study or Subgroup	Exercise Mean	Exercise SD	Exercise Total	Usual care Mean	Usual care SD	Usual care Total	Weight	Std. Mean Difference IV, Random, 95% CI
1.1.1 Cognition: all trials								
Christofoletti 2008	14.9	2.2	17	14.8	1.3	20	13.4%	0.06 [-0.59, 0.70]
Eggermont 2009a	0.24	0.78	51	0.2	0.63	46	15.2%	0.06 [-0.34, 0.45]
Eggermont 2009b	0.07	0.37	30	0.47	0.97	31	14.4%	-0.53 [-1.05, -0.02]
Hwang 2010	28.9	11.86	10	24	14.68	8	11.0%	0.35 [-0.58, 1.29]
Kemoun 2010	30.38	7.66	16	22.23	8.37	15	12.5%	0.99 [0.24, 1.74]
Van de Winckel 2004	15.33	4.44	15	11	4.3	9	11.5%	0.95 [0.08, 1.83]
Venturelli 2011	12	2	11	6	2	10	8.5%	2.88 [1.59, 4.17]
Vreugdenhil 2012	23.9	5	20	19	7.7	20	13.4%	0.74 [0.10, 1.38]
Subtotal (95% CI)			**170**			**159**	**100.0%**	**0.55 [0.02, 1.09]**
Heterogeneity: $Tau^2 = 0.45$; $Chi^2 = 34.67$, df = 7 (P < 0.0001); $I^2 = 80\%$								
Test for overall effect: Z = 2.03 (P = 0.04)								
1.1.2 Cognition: excluded moderate-severe dementia								
Christofoletti 2008	14.9	2.2	17	14.8	1.3	20	14.7%	0.06 [-0.59, 0.70]
Eggermont 2009a	0.24	0.78	51	0.2	0.63	46	18.6%	0.06 [-0.34, 0.45]
Eggermont 2009b	0.07	0.37	30	0.47	0.97	31	16.8%	-0.53 [-1.05, -0.02]
Hwang 2010	28.9	11.86	10	24	14.68	8	10.7%	0.35 [-0.58, 1.29]
Kemoun 2010	30.38	7.66	16	22.23	8.37	15	13.1%	0.99 [0.24, 1.74]
Van de Winckel 2004	15.33	4.44	15	11	4.3	9	11.4%	0.95 [0.08, 1.83]
Vreugdenhil 2012	23.9	5	20	19	7.7	20	14.7%	0.74 [0.10, 1.38]
Subtotal (95% CI)			**159**			**149**	**100.0%**	**0.31 [-0.11, 0.74]**
Heterogeneity: $Tau^2 = 0.21$; $Chi^2 = 18.49$, df = 6 (P = 0.005); $I^2 = 68\%$								
Test for overall effect: Z = 1.45 (P = 0.15)								

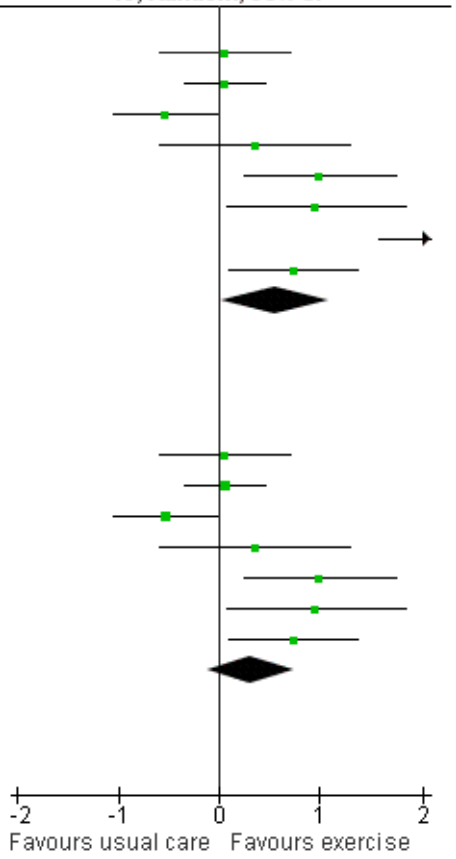


Figure 5. Forest plot of comparison 2: Physical activity vs usual care: Activities of daily living (ADLs)

Study or Subgroup	Exercise Mean	SD	Total	Usual care Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
2.1.1 ADL: all trials								
Francese 1997	24.67	2.66	6	26.6	2.3	5	12.0%	-0.70 [-1.95, 0.54]
Conradsson 2010	-1	2.72	43	-1.69	3.19	48	22.3%	0.23 [-0.18, 0.64]
Rolland 2007	2.6	1.5	56	2.2	1.5	54	22.7%	0.26 [-0.11, 0.64]
Vreugdenhil 2012	99.6	1.2	20	94.2	12.6	20	19.5%	0.59 [-0.04, 1.23]
Venturelli 2011	42	4	11	32	6	10	13.8%	1.90 [0.83, 2.97]
Santana-Sosa 2008	92.5	8.5	8	70	6.5	8	9.7%	2.81 [1.32, 4.30]
Subtotal (95% CI)			**144**			**145**	**100.0%**	**0.68 [0.08, 1.27]**
Heterogeneity: $Tau^2 = 0.37$; $Chi^2 = 22.19$, df = 5 (P = 0.0005); $I^2 = 77\%$								
Test for overall effect: Z = 2.24 (P = 0.03)								
Total (95% CI)			**144**			**145**	**100.0%**	**0.68 [0.08, 1.27]**
Heterogeneity: $Tau^2 = 0.37$; $Chi^2 = 22.19$, df = 5 (P = 0.0005); $I^2 = 77\%$								
Test for overall effect: Z = 2.24 (P = 0.03)								
Test for subgroup differences: Not applicable								

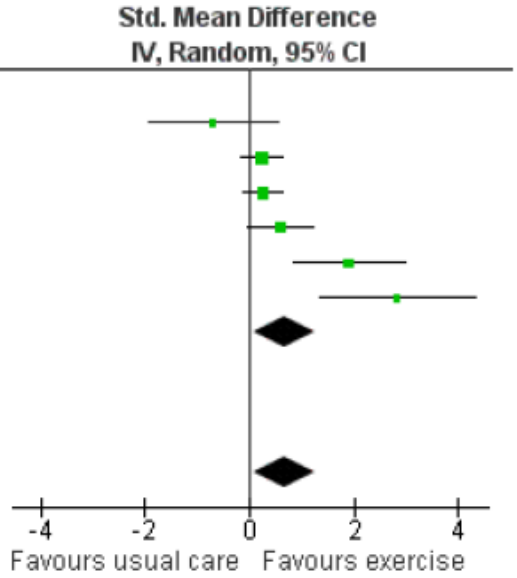
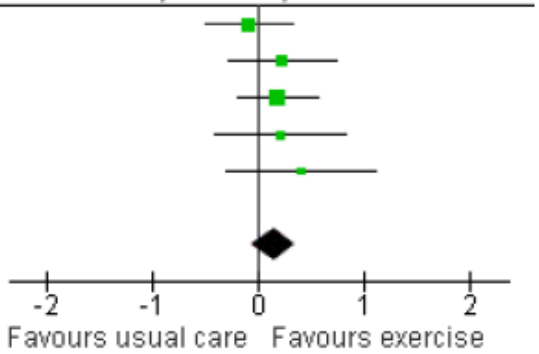


Figure 6. Forest plot of comparison 3: Physical activity vs usual care: depression

	Usual care			Exercise				Std. Mean Difference	Std. Mean Difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**Weight**	**IV, Random, 95% CI**	**IV, Random, 95% CI**
Conradsson 2010	-0.13	1.9	45	0.07	2.6	42	26.6%	-0.09 [-0.51, 0.33]	
Eggermont 2009b	7.13	5.1	31	6.03	4.38	30	18.5%	0.23 [-0.28, 0.73]	
Rolland 2007	14.8	7.2	54	13.4	8	56	33.5%	0.18 [-0.19, 0.56]	
Vreugdenhil 2012	2.3	1.4	20	2	1.5	20	12.2%	0.20 [-0.42, 0.82]	
Williams 2008	11.75	8.1	10	9.01	6.11	33	9.2%	0.41 [-0.31, 1.12]	
Total (95% CI)			**160**			**181**	**100.0%**	**0.14 [-0.07, 0.36]**	

Heterogeneity: Tau² = 0.00; Chi² = 1.87, df = 4 (P = 0.76); I² = 0%

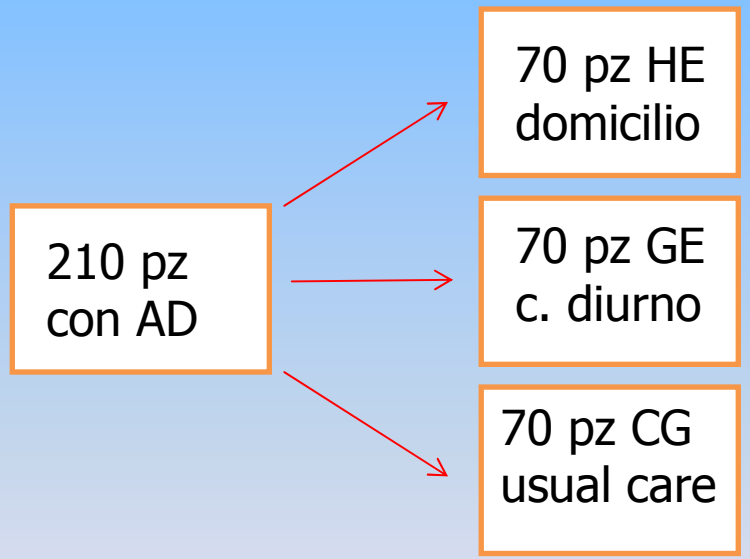
Test for overall effect: Z = 1.29 (P = 0.20)



Effects of Exercise on Cognition: The Finnish Alzheimer Disease Exercise Trial: A Randomized, Controlled Trial

Hannareeta Öhman, MD,[*†‡] *Niina Savikko, RN, PhD,*[§] *Timo E. Strandberg, MD, PhD,*[¶**††] *Hannu Kautiainen, PhD,*[*†] *Minna M. Raivio, MD, PhD,*[*†] *Marja-Liisa Laakkonen, MD, PhD,*[*†‡] *Reijo Tilvis, MD, PhD,*[¶**] *and Kaisu H. Pitkälä, MD, PhD*[*†]

JAGS, 2016



COGNITIVITA'

Clock-Drawing Test (CDT)

Fluenza verbale (VF)

Mini-Mental State examination (MMSE)

Clinical Dementia Rating Scale (CDR)

Valutazioni al baseline, a 3 mesi, a 6 mesi e 12 mesi

Table 3. Baseline Values and Mean Changes over 12 Months on the Clock Drawing Test and Verbal Fluency

Test	Home-Based Exercise	Group Exercise	Control
Clock Drawing Test			
Baseline, mean ± SD	2.32 ± 2.04	2.31 ± 2.09	2.45 ± 2.09
Change, mean (95% CI)	0.54 (0.17–1.00)	0.06 (−0.38–0.49)	−0.14 (−0.57–0.31)
Verbal Fluency test			
Baseline, mean ± SD	8.34 ± 4.75	8.05 ± 4.30	7.89 ± 4.25
Change, mean (95% CI)	−0.95 (−1.62 to −0.20)	−0.76 (−1.37 to −0.11)	−0.90 (−1.54 to −0.24)

95% confidence intervals (CI) were obtained using bias-corrected bootstrapping (5,000 replications).
SD = standard deviation.

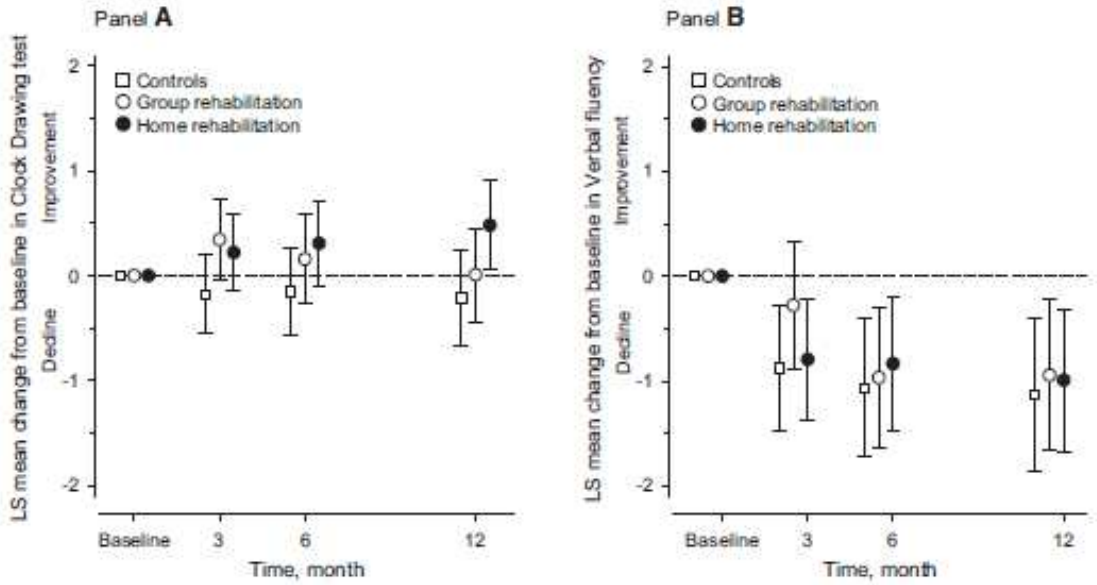


Figure 2. Changes in (A) Clock Drawing Test and (B) Verbal Fluency scores from baseline (adjusted for age, sex, and Clinical Dementia Rating). LS = least squares (mean).

ATTIVITA’ MOTORIA E DETERIORAMENTO COGNITIVO

- Effetti aberranti

ATTIVITA’ MOTORIA ABERRANTE COME DISTURBO COMPORTAMENTALE

- Affaccendamento
- Wandering
- Ipersessualità
- Fuga

IL COMMISSARIO STRAORDINARIO DEL GOVERNO
PER LE PERSONE SCOMPARSE

Roma, 7 ottobre 2015

All. 2

AI SIG.RI PREFETTI DELLA REPUBBLICA
LORO SEDI

AL SIG. COMMISSARIO DEL GOVERNO
PER LA PROVINCIA DI
TRENTO

AL SIG. COMMISSARIO DEL GOVERNO
PER LA PROVINCIA DI
BOLZANO

AL SIG. PRESIDENTE DELLA REGIONE
AUTONOMA VALLE D'AOSTA
Servizi di Prefettura
AOSTA

e,p.c.

AL MINISTERO DELL'INTERNO
GABINETTO DEL MINISTRO

ALL'UFFICIO DEL VICE MINISTRO
DELL'INTERNO
Sen. Filippo Bubbico

ALL'UFFICIO DEL SOTTOSEGRETARIO
DI STATO ALL'INTERNO
Dott. Domenico Manzione

ALL'UFFICIO DEL SOTTOSEGRETARIO
DI STATO ALLA SALUTE
Dott. Vito De Filippo

ALL'UFFICIO DEL SOTTOSEGRETARIO
DI STATO AL LAVORO E ALLE POLITICHE
SOCIALI
Sen. Massimo Cassano

AL DIPARTIMENTO DI PUBBLICA SICUREZZA
Segreteria del Dipartimento
ROMA

OGGETTO: Direttiva per favorire il rapido rintraccio delle persone scomparse malate di Alzheimer.

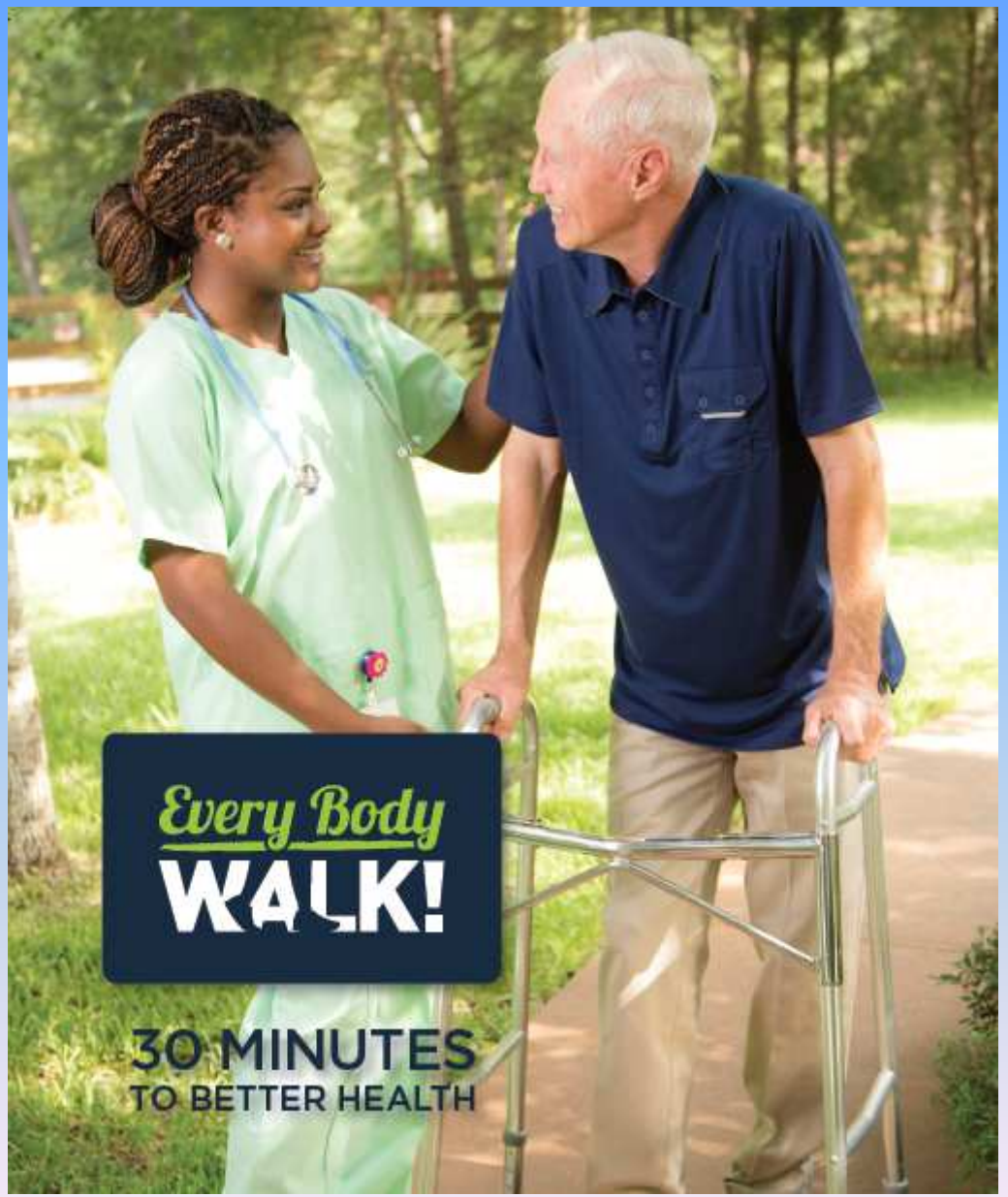
CONCLUSIONI

- L'attività fisica moderata-intensa sembra ridurre il rischio di sviluppo di deterioramento cognitivo, anche se le evidenze sono limitate (bias?)

- L'attività fisica, particolarmente quella aerobica, in soggetti già affetti da declino cognitivo è associata a lieve miglioramento (in alcuni casi a un contenimento del peggioramento) di alcuni domini (funzioni esecutive, abilità visuo-spaziali)

- Esistono numerose evidenze che l'attività fisica ritarda l'invecchiamento cerebrale e può favorire la neurogenesi

- Va incoraggiata e sostenuta l'attività fisica anche negli anziani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TO BETTER HEALTH