



JAMDA

journal homepage: www.jamda.com



Letter to the Editor

Attenuation of the Effect of Multimorbidity on Cardiovascular Mortality by Physical Activity in Older Adults

To the Editor:

Multimorbidity, defined as the coexistence of two or more chronic conditions, is highly prevalent among older adults.¹ Because the risk of cardiovascular disease (CVD) increases with age, older adults are more likely to have multiple CVD-related chronic conditions. Physical activity (PA) is an effective intervention to improve the prognosis of most types of CVDs² and is a core component of CVD rehabilitation programs. However, the effect of PA on health outcomes in the multimorbid elder is mostly unknown.^{2,3} We therefore investigated the stratified and joint associations of PA and the number of chronic conditions on long-term CVD mortality in a representative sample of older adults from Spain.

We used data from the UAM cohort (response rate = 71%) comprising 4008 individuals (1,739 men) representative of the noninstitutionalized population aged ≥ 60 years in Spain.⁴ Information on the following 11 chronic conditions diagnosed by a physician and reported by the study participants were recorded: (1) asthma/chronic bronchitis, (2) hypertension, (3) coronary heart disease (CHD), (4) stroke, (5) osteoarthritis/rheumatism, (6) cataracts, (7) diabetes mellitus, (8) depression under drug treatment, (9) hip fracture, (10) Parkinson's disease, and (11) cancer at any site. Participants rated their leisure time PA level as (1) inactive, (2) occasional, (3) several times a month, and (4) several times a week.⁴ Those reporting participation in any PA were considered physically active. The outcome variable for the present study was CVD mortality from study baseline in 2000/2001 to the end of follow-up at December 31, 2014.

The analyses were conducted with 3978 individuals (2250 women) with complete information on all study variables. The associations were summarized with hazard ratios (HRs) and their 95% confidence interval (CI) obtained from Cox regression. The analyses were adjusted for the following potential confounders: age, sex, educational attainment, smoking, alcohol consumption, body mass index, and waist circumference. From the 11 chronic conditions reported, we only considered those that were associated ($P < .1$) with mortality in age and sex-adjusted analyses¹:

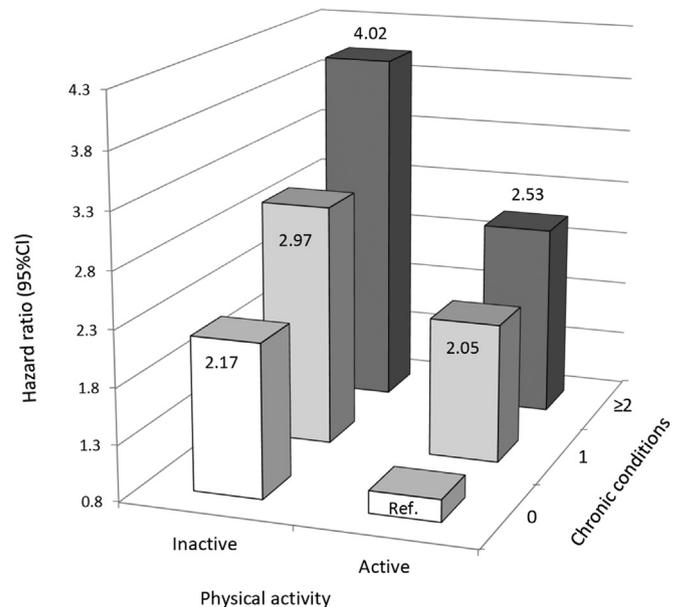


Fig. 1. Cardiovascular disease mortality risk across categories of physical activity and number of chronic conditions in older adults ($n = 3978$). Chronic conditions include asthma/bronchitis, hypertension, coronary heart disease, stroke, diabetes, and depression. Analyses were adjusted for age, sex, educational attainment, smoking, alcohol consumption, body mass index, and waist circumference.

asthma/bronchitis, hypertension, CHD, stroke, diabetes, and depression.

At baseline, the percentage of participants with 0, 1, and ≥ 2 chronic conditions was 42.1%, 36.4%, and 21.5%, respectively. The mean follow-up time was 10.7 ± 4.3 years with a total of 684 CVD deaths. CVD mortality was higher in those with asthma/bronchitis (HR = 1.56, 95% CI, 1.23–1.98), hypertension (HR = 1.35, 95% CI, 1.13–1.61), CHD (HR = 1.70, 95% CI, 1.25–2.30), stroke (HR = 1.70, 95% CI, 1.25–2.30), diabetes (HR = 1.50, 95% CI, 1.21–1.87) and depression (HR = 1.60, 95% CI, 1.25–2.05). Compared to those with no chronic conditions, the HRs (95% CI) for CVD mortality among participants with 1 and ≥ 2 chronic conditions were 1.66 (1.36–2.04) and 2.22 (1.78–2.76), respectively.

Being physically active reduced the hazard of CVD mortality (95% CI) by 50% (32%–64%), 35% (22%–52%), and 40% (16%–57%) in participants with 0, 1 and ≥ 2 chronic conditions. Moreover, compared to individuals who were physically active and had no chronic conditions, participants with 1 and ≥ 2 chronic conditions who were physically inactive had the highest CVD mortality risk; thus, PA attenuates the health impact of chronic conditions because the HR for CVD mortality was lower in active individuals with ≥ 2 chronic conditions than in those who were inactive and had only one condition (Figure 1).

Supported by FIS grant 12/1166 (Instituto de Salud Carlos III, State Secretary of R+D+I and FEDER/FSE), MINECO R+D+I grant (DEP2013-47786-R), MECO mobility grant (JC2015-00080), the FRAILOMIC Initiative (European Union FP7-HEALTH-2012-Proposal No. 305483-2, and the ATHLOS project (European project H2020—Project ID: 635316).

<http://dx.doi.org/10.1016/j.jamda.2016.09.007>

1525-8610/© 2016 AMDA – The Society for Post-Acute and Long-Term Care Medicine.

These findings suggest that, among older adults, PA should be promoted to reduce CVD death regardless of the level of morbidity. Given that older adults with multimorbidity are less physically active than those with less morbidity, multimorbid individuals should be encouraged to be as physically active as their abilities and conditions allow,⁵ because even small increases in PA might be beneficial.²

References

1. Marengoni A, Angleman S, Melis R, et al. Aging with multimorbidity: A systematic review of the literature. *Ageing Res Rev* 2011;10:430–439.
2. Physical Activity Guidelines Advisory Committee. Physical Activity Guidelines Advisory Committee Report, 2008. Washington, DC: U.S. Department of Health and Human Services. Available at: <http://health.gov/paguidelines/report/>; 2008. Accessed July 7, 2016.
3. U.S. Department of Health and Human Services. Multiple chronic conditions—a strategic Framework: Optimum health and Quality of Life for individuals with multiple chronic conditions. Washington, DC: U.S. Department of Health and Human Services. Available at: http://www.hhs.gov/sites/default/files/ash/initiatives/mcc/mcc_framework.pdf; 2010. Accessed July 7, 2015.
4. Martinez-Gomez D, Guallar-Castillón P, Hallal PC, et al. Nonexercise cardiorespiratory fitness and mortality in older adults. *Med Sci Sports Exerc* 2015;47:568–574.
5. World Health Organization. Global recommendations on physical activity for health. Geneva: World Health Organization. Available at: <http://www.who.int/entity/dietphysicalactivity/publications/9789241599979/en/index.html>; 2010. Accessed July 7, 2010.

David Martinez-Gomez, PhD
*Department of Physical Education
Sport and Human Movement
Faculty of Teacher Training and Education
Universidad Autónoma de Madrid
Madrid, Spain*

Pilar Guallar-Castillon, MD, PhD
, Fernando Rodríguez-Artalejo, MD, PhD
*Department of Preventive Medicine and Public Health
School of Medicine, Universidad Autónoma de Madrid/IdiPaz, and
CIBER of Epidemiology and Public Health (CIBERESP)
Madrid, Spain*

Stefania Bandinelli, MD
*Geriatric Unit
Health Tuscany Center
Florence, Italy*