



Disponible en ligne sur

**ScienceDirect**  
 www.sciencedirect.com

Elsevier Masson France

**EM|consulte**  
 www.em-consulte.com


## Letters to the Editors

**Sex differences in cardiovascular risk factors: A growing concern**


## ARTICLE INFO

 Keywords:  
 Women  
 Risk factors  
 Sex

## To the Editor,

We read with great interest the recent article “Epidemiology of Cardiovascular Risk Factors: Behavioural Risk Factors” by Olié et al., which highlights the prevalence and impact of modifiable risk factors for cardiovascular diseases in the French population [1]. The authors acknowledge the narrowing gap between men and women in terms of risk factor prevalence, but we would like to emphasize a crucial point: this convergence is often caused by a worsening of the situation among women rather than an improvement in men’s cardiovascular health [2,3].

The article notes that smoking rates among women have increased, physical activity levels have declined and dietary habits have deteriorated – particularly salt consumption [1]. This shift reflects broader societal changes, including evolving lifestyle patterns and increased stress levels, which affect women disproportionately [2–4]. The evolving epidemiological trends reveal a troubling reality: women’s cardiovascular health is steadily declining as their lifestyle patterns increasingly resemble those traditionally associated with men’s heightened risk. One of the most striking shifts is the rise in alcohol consumption among women. Although still lower than in men, this increase is concerning, as excessive alcohol intake contributes to hypertension, metabolic disturbances and an overall higher cardiovascular burden. At the same time, rising stress levels – fuelled by the ever-growing demands of work, family responsibilities and societal expectations – are taking a significant toll on women’s health. The pressure to balance multiple roles often leads to stress-induced behaviours, such as unhealthy eating habits, smoking and physical inactivity, all of which amplify cardiovascular risk [2–4].

Compounding these challenges is the alarming increase in metabolic syndrome and obesity among women. The combination of hypertension, dyslipidaemia, insulin resistance and central obesity has become more prevalent, creating a perfect storm for cardiovascular disease. These interconnected factors not only elevate immediate health risks, but also set the stage for long-term complications, reinforcing the urgent need for targeted prevention strategies tailored to women’s unique health concerns. Historically,

cardiovascular disease has been perceived as a predominantly male disease, leading to under-recognition and undertreatment in women [5]. However, current epidemiological trends suggest that women are increasingly adopting behaviours traditionally associated with higher cardiovascular risk [2,6].

Sex-specific differences extend beyond behavioural factors. Women exhibit distinct pathophysiological responses to cardiovascular insults, such as heightened inflammatory reactions and greater susceptibility to microvascular dysfunction. Additionally, hormonal influences – particularly postmenopausal changes – exacerbate metabolic risk factors, yet many prevention strategies remain largely derived from male-centric studies [7,8].

The growing burden of cardiovascular disease in women necessitates urgent sex-specific prevention strategies; these should include targeted public health campaigns addressing smoking cessation, physical activity promotion and dietary modifications, particularly among younger and middle-aged women [9,10]. Moreover, healthcare professionals should be trained to recognize and manage cardiovascular risk in women more effectively [9,10].

In conclusion, while the epidemiology of cardiovascular disease risk factors is evolving, the rising prevalence among women is alarming. Future research and policy interventions must account for these sex-specific differences to curb the increasing cardiovascular burden in women and bridge the persistent sex gap in cardiovascular care.

## Sources of funding

None.

## Disclosure of interest

The authors declare that they have no competing interest.

## References

- [1] Olié V, Grave C, Helft G, et al. Epidemiology of cardiovascular risk factors: behavioural risk factors. *Arch Cardiovasc Dis* 2024;117(12):770–84. <http://dx.doi.org/10.1016/j.acvd.2024.10.328>.
- [2] Vogel B, Acevedo M, Appelman Y, et al. The Lancet women and cardiovascular disease commission: reducing the global burden by 2030. *Lancet* 2021;397(10292):2385–438. [http://dx.doi.org/10.1016/S0140-6736\(21\)00684-X](http://dx.doi.org/10.1016/S0140-6736(21)00684-X).
- [3] Mattioli AV, Moscucci F, Sciomer S, et al. Cardiovascular prevention in women: an update by the Italian Society of Cardiology Working Group On “Prevention, Hypertension and peripheral disease”. *J Cardiovasc Med (Hagerstown)* 2023;24(Suppl. 2):e147–55. <http://dx.doi.org/10.2459/JCM.0000000000001423>.
- [4] Coppi F, Bucciarelli V, Solodka K, et al. The impact of stress and social determinants on diet in cardiovascular prevention in young women. *Nutrients* 2024;16:1044. <http://dx.doi.org/10.3390/nu16071044369>.
- [5] Grave C, Gabet A, Iliou MC, et al. Temporal trends in admission for cardiac rehabilitation after an acute coronary syndrome in France from 2009

- to 2021: persistent sex, age and social disparities. *Arch Cardiovasc Dis* 2024;117(4):234–43, <http://dx.doi.org/10.1016/j.acvd.2023.12.008>.
- [6] Mattioli AV, Coppi F, Nasi M, Gallina S. Stress and cardiovascular risk burden after the pandemic: current status and future prospects. *Expert Rev Cardiovasc Ther* 2022;20(7):507–13, <http://dx.doi.org/10.1080/14779072.2022.2092097>.
- [7] Merone L, Tsey K, Russell D, Nagle C. Sex inequalities in medical research: a systematic scoping review of the literature. *Womens Health Rep* 2022;3(1):49–59, <http://dx.doi.org/10.1089/whr.2021.0083> [Erratum in: *Womens Health Rep* (New Rochelle) 2022;3(1):344. doi:10.1089/whr.2021.0083.correx. PMID: 35136877; PMCID: PMC8812498].
- [8] Wenger NK, Lloyd-Jones DM, Elkind MSV, et al. Call to action for cardiovascular disease in women: epidemiology, awareness, access, and delivery of equitable health care: a presidential advisory from the American Heart Association. *Circulation* 2022;145(23):e1059–71, <http://dx.doi.org/10.1161/CIR.0000000000001071>.
- [9] Mattioli AV, Gallina S. Early cardiovascular prevention: the crucial role of nurse-led intervention. *BMC Nurs* 2023;22(1):347, <http://dx.doi.org/10.1186/s12912-023-01511-6> [Published 2023 Oct 2].
- [10] Adreak N, Mackay MH, Pike A, et al. Integration of women's cardiovascular health content into healthcare provider education: results of a rapid review and national survey. *CJC Open* 2023;6(2 Part B):463–72, <http://dx.doi.org/10.1016/j.cjco.2023.11.001> [Published 2023 Nov 4].

Anna Vittoria Mattioli\*

*Department of Quality of Life Sciences, University of Bologna-Alma Mater Studiorum, 40126 Bologna, Italy*

Sabina Gallina

*Department of Neuroscience, Imaging and Clinical Sciences, "G. d'Annunzio" University of Chieti-Pescara, 66100 Chieti, Italy*

\* Corresponding author. Department of Quality of Life Sciences, University of Bologna-Alma Mater Studiorum, Via Marsala 49/A, 40126 Bologna, Italy.

Received 29 January 2025

Accepted 8 February 2025

Available online 6 May 2025