

## ORIGINAL STUDY

# Health screening of middle-aged women: what factors impact longevity?

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### Abstract

**Objective:** The aim of this study was to measure the impact of different risk factors in middle-aged women on longevity evaluated after three decades of an initial health screening.

**Methods:** Women who received a preventive health care **control** between 1990 and 1993 were recruited. Anamnesis and physical examination were recorded. Blood samples for the measurement of glycemia and lipids were taken. Data are reported as of December 2021.

**Results:** A total of 1,158 women aged 40 to 60 were studied. At 30.9 years of follow-up, the Kaplan-Meier overall survival was 75.6% (95% confidence interval, 72.6-78.3). The main causes of the 260 deaths observed were the following: cancer (n = 88; 33.8%), cardiovascular disease (n = 55; 21.2%), and infectious disease (n = 41; 15.8%). The following hazard ratios were found with the flexible parametric survival model: personal history of fracture (hazard ratio, 2.55; 95% confidence interval, 1.29-5.02; P = 0.007), type 2 diabetes mellitus (2.14; 1.18-3.88; P = 0.012), personal history of heart disease (1.85; 1.09-3.13; P = 0.022), chronic arterial hypertension (1.65; 1.25-2.17; P < 0.001), postmenopausal status (1.60; 1.13-2.26; P = 0.008), unskilled jobs (1.56; 1.17-2.07; P = 0.002), cigarette smoking (1.51; 1.17-1.94; P = 0.002), age (1.06; 1.03-1.09; P < 0.001), body mass index (1.04; 1.01-1.07; P = 0.004), multiparous (0.72; 0.56-0.93; P = 0.012), and active sexual intercourse (0.68; 0.52-0.87; P = 0.003). Lipid disorders did not reach statistical significance as a risk factor.

**Conclusions:** In this cohort, it was observed that most of the classic risk factors for mortality were present. However, a history of fracture appears in middle-aged women as a strong predictor of mortality, surpassing diabetes and arterial hypertension. Multiparity, on the other hand, was a protective factor.

**Keywords:** Cohort – Health screening – Middle-aged women – Mortality – Risk factors.

The US Preventive Services Task Force recommends a health examination that regularly evaluates woman's medical, physical, gynecological, and breast history, as well as weight, lipid values, and the presence of depression.<sup>1</sup> However, the impact of these health checkups on long-term health is disputed. There are no randomized and controlled studies that eval-

uate the results over morbidity and mortality. The results of observational studies may be distorted by selection bias; people who are checked regularly are likely to engage in healthier lifestyles and follow therapies that mitigate risk factors more rigorously than individuals who do not.<sup>2</sup>

Among the observational studies that evaluate the impact of the health examination, we must mention a French study that evaluated the effect of preventive examinations on mortality. It evaluated 50,000 people of both sexes and followed them for a maximum of 25 years, showing a reduction in mortality only in men, especially in those who returned at least once to their medical checkups, in particular those women with a higher health interest.<sup>3</sup> In contrast, a Japanese study that evaluated 48,775 participants aged 40 to 79 years followed up 11 years since 1994 showed that individuals who attended medical checkups had lower mortality in both men and women (hazard ratio [HR], 0.74; confidence interval [CI] 95%, 0.62-0.88 vs HR, 0.69; 95% CI, 0.52-0.91).<sup>4</sup>

Regardless of the effect that medical checkups could have on morbidity and mortality, these evaluations allow us to detect risk factors early in a particular population and evaluate their long-term effects on longevity. Therefore, we designed a study to measure the impact of different risk factors in middle-aged women on mortality evaluated after three decades of an initial **control**. These results

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