Once a relatively rare event, reaching old age has now become a concrete possibility for a growing number of individuals in Western societies. Yet, it is still unclear which factors have the greatest impact on human longevity (Dato et al., 2017). Apart from genetic background, healthy nutrition, strong social support, and the availability of an efficient healthcare system, an active lifestyle has been claimed to be a key component to living a longer and healthier life (Reimers et al., 2012). Several studies have shown that the impact of physical activity in reducing mortality varies from 20% to 40%, corresponding to a gain of about 7 years of lifespan (Hupin et al., 2015). More specifically, regular physical activity has been shown to improve a number of metabolic biomarkers and to delay the onset of chronic, non-communicable diseases, including cardiovascular (Cheng et al., 2018) and malignant disease (Moore et al., 2016). Importantly, a few systematic reviews have pointed out that physical activity, of mild-to-moderate intensity, may reduce the cognitive decline associated with aging and even ameliorate some psychological indicators of mental health (Northey et al., 2018). In addition, anxiety and depression, according to a recent report, affect 4.4% of the world’s population (WHO, 2017); both of these disorders are significantly reduced by physical activity on prescription (PAP) (Peven et al., 2018) and participation in leisure-time activities (e.g. walking, cycling, gardening, and dancing) (Arem et al., 2015). Recently, an American cross-sectional study recruiting over a million adults found that engagement in physical activity resulted in a 11.8–22.3% reduction in poor mental health, after adjusting for multiple sociodemographic and physical variables (Chekroud et al., 2018). In a recent study conducted in 14,585 older adults, Felez-Nobrega et al. even found a positive association between physical activity and “happiness”, measured using a cross-culturally validated single-item question (odds ratio 1.27; 95% confidence interval 1.04–1.54) (Felez-Nobrega et al., 2020). Indeed, since cognitive decline and depression are associated with shortened life expectancy, recommendations aimed at increasing motor activity in the elderly are probably a cost-effective way to improve health and satisfaction in later life, despite persisting controversy about the magnitude of the effect size (Lee et al., 2015).

Although research on the relationship between physical activity and aging has largely benefited from animal models, a study in older or middle-adult human subjects offers further advantages, such as the possibility of long-term follow-up data that may be valuable to detect relevant temporal variations in motor patterns. More importantly, the impact of motor activity on higher cognitive functions and metacognitive aspects during aging can obviously be explored only in humans.

In the past 20 years, a new study model has become available to researchers, namely, the long-lived populations known as Blue Zones (Poullain et al., 2013). A total of four communities where life expectancy is demonstrably longer than in the average Western and Eastern populations have been identified across different continents (Poulain et al., 2013). Being isolated populations, their genetic makeup and lifestyle are particularly homogeneous, making it easier to gain better insight into longevity determinants than analyzing more heterogeneous populations living in developed countries. One of these Blue Zones, located in the central area of the Mediterranean island of Sardinia, Italy, is currently the subject of intense multidisciplinary research (Pes et al., 2013, 2020). Previous studies have investigated physical activity in nonagenarians from the Sardinian Blue Zone by using historical data (Pes et al., 2013), as well as using portable movement sensors able to accurately record several general and chronobiological features of motor activity (Pes et al., 2018). In these studies, total energy expenditure recorded in nonagenarians (male: 2284 ± 543 kCal/day; female: 1810 ± 302 kCal/day) was among the best indices of physical performance ever reported in the literature for this age group (Pes et al., 2018), suggesting that most of the Sardinian Blue Zone elderly remain physically active into their ninth decade. However, there are virtually no studies that have evaluated the impact of physical activity on cognition and psychological well-being in elderly people living in the Blue Zones. In the article “Mental Health and Motor Efficiency of Older Adults Living in the Sardinia’s Blue Zone: A Follow-up Study,” Fastame et al. (2020) interviewed
91 community-based elderly individuals aged between 68 and 92 years. By doing so, Fastame et al. provided new and important evidence about the role of motor activity in this extraordinarily long-lived population. Cognitive and metacognitive performance was assessed using validated self-report inventories, whereas mobility responses were measured with wearable inertial measurement units (IMUs), which have been used for more than a decade thanks to their reliability and ease of use, as well as their low cost (Grimm and Bolink, 2016). In this longitudinal study, the authors confirmed previous results showing that the average levels of self-reported psychological well-being in this community are quite high compared with national reference data (Fastame et al., 2018). Moreover, these indicators improved significantly at 2 years of follow-up and were significantly correlated with IMU-assessed motor performance. In line with the literature (Matud et al., 2019), the indices of psychological well-being turned out to be higher in males than in females, a remarkable finding in a population characterized by a level of male longevity similar to that of women (Poulain et al., 2013). It is therefore tempting to interpret the relatively superior performance of males in cognitive skills as a result of their ability to maintain a higher level of physical activity until old age compared with females, although the causality of this association cannot be sufficiently demonstrated. In both sexes, in any case, physical activity resulting from leisure time often has a socially oriented dimension, which enables old people of the same age, including widowers, to join spontaneously, thus escaping the sense of loneliness that afflicts most elderly people in urban societies. Such outstanding performance is usually attributed to a lower tendency of old people to be institutionalized and to the maintenance of strong social and family ties until old age (Pes et al., 2020); however, much more complex explanations must be considered.

In carrying out their study, the authors necessarily had to deal with some methodological limitations that deserve to be mentioned. First of all, the short follow-up period (2 years) presumably implied less intense temporal variations in the measurements carried out, to such an extent that some results were not statistically significant (e.g. stride length); this might be attributed to the short observation time rather than to a true lack of association. Second, since among the exclusion criteria of the participants there was the use of ambulatory devices, it cannot be ruled out that the study participants displayed an overall better performance than their aged peers in the sampled population, which may potentially limit, albeit mildly, the generalizability of the results. Furthermore, the cognitive status of the participants was necessarily reliant on low-sensitivity, albeit easy-to-administer, measures of cognition such as the Mini-Mental State Examination (MMSE). Fortunately, the assessment of perceived depression signs in respondents did not suffer from these limits, being based on the use of largely validated and reliable scales such as the 20-item Center of Epidemiological Studies Depression Scale. In addition, the poor education of respondents, typical of this rural community, may have reduced their capacity to give a valid self-report on some questionnaires, and subgroups were admittedly unbalanced regarding the attained education level. Finally, a concern remains about reverse causation, widely discussed in the literature (Gow et al., 2012), namely whether it is the better physical activity of Blue Zoners that causes an improvement in mental performance, or whether, on the contrary, individuals with a higher level of psychological well-being can manage to engage in more effective and longer lasting motor activities. Presumably, it is to avoid this bias that the authors wisely excluded participants with clear evidence of dementia at baseline. Despite these limitations, the study by Fastame et al. is up to now the only longitudinal study that draws attention to the relationship between motor activity and psychological well-being in the elderly of a population characterized by exceptional longevity; it sheds light on important aspects that go beyond the features of the exotic populations living in Blue Zones. It is a real advancement toward a deeper understanding of the role of exercise during aging, and it may suggest useful indications to restore and maintain mental well-being in the aging population of our post-industrial societies.

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