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Editorial
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# Physical Activity Promotion for Cancer Prevention

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## Editorial

Physical activity is known to reduce all-cause mortality [1], and individuals who maintain a lifestyle with high mobility and physical activity appear to have a remarkably lower risk of non-communicable diseases, including cancer. In fact, leisure-time physical activity is associated with lower risks of the primary development of many cancer types. Moore and colleagues [2] examined 12 prospective cohort studies with 1.44 million participants, analyzing leisure-time physical activity in relation to risk of 26 different cancer types, showing that increasing levels of leisure-time physical activity were associated with lower risks of 13 of the 26 cancers investigated. Furthermore, it should be emphasized that most of these associations were evident independently of body size or smoking history, supporting broad generalizability of these findings.

Several studies suggest that exposure to exercise following the diagnosis of certain solid tumors might lower the progression of disease and reduce cancer-related mortality [3]. Recently, Hojman et al. [4] reviewed the current molecular evidence about the effect of exercise on cancer. The Authors proposed that exercise has a role in controlling cancer progression through a direct effect on tumor-intrinsic factors and the interplay with whole-body exercise effects. These tumor growth-inhibitory effects could be mediated by several different mechanisms, such as the release of several systemic factors (i.e., catecholamines, myokines, etc.) and sympathetic activation, modulated during exercise performance. The acute effect of a single exercise section leads to intratumoral adaptations following long-term training, contributing to slower tumor progression. Growth factors such as insulin and IGFs stimulate cancer cell proliferation through the activation of their respective receptor tyrosine kinases, which trigger the major signal transduction pathways (e.g. PI3K/AKT and MAPK pathways) [5]. Chronic exercise reduces growth factor availability in the systemic milieu, and presumably in the tumor microenvironment, induced by a prolonged physical inactivity [6].

In this context, promoting physical activity represents a fundamental aim for primary, secondary and tertiary cancer prevention. It is well known that an active life begins during childhood and adolescence, and physical inactivity in young people is reflected in weight gain and non-communicable disease-related health problems for adults. Taking into account that there is evidence that children's and adolescents' physical activity is in general decline, physical activity promotion in primary and secondary schools is a global public health priority.

Teaching could be an important tool to promote physical activity in young people, stimulating students to increase autonomy, competence and satisfaction during physical education lesson. Teachers should favor the motivational processes to determine enjoyment and interest in physical activity. Modalities of physical education teaching in the higher secondary school partly affect the behaviors and choices of students; in fact, it has been shown that the extracurricular activities offered by schools are related to the choice of university course and to the current practice of physical activity [7]. This study also point the attention to the need of enhance physical education. The quality of school physical education can be improved through policies, teacher training, use of activities-focused curricula, and small class sizes [8]. An interactive teaching style involving students, families, and school staff, should be adopted by physical educators which play an essential role in changing physical behavior in youth [9]. Moreover, a good strategy to promote sport participation in students and to increase their weekly physical activity levels is represented by the links between sport societies, sport promotion associations, and institutions [7]. Overall, physical activity promotion could be obtained through an increase of the time allocated to physical activity lessons and through their assignment to well-trained teachers, whereas extracurricular physical activity programs should be maintained and enhanced [7].

However, physical activity promotion to improve the health of populations has lagged in relation to the available evidence about sedentary and cancer prevention; hence, authorities should urgently implement policies that support high-quality, compulsory physical education, encouraging

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and supporting active travel to school, and providing opportunities for physical activity during and after the school day.

In conclusion, as suggested by Kohl et al. [10], a systems approach that focuses on populations and the complexity related to physical inactivity, rather than solely a behavioral/scientific approach focusing on individuals, is the way forward to increase physical activity worldwide to prevent non-communicable disease including cancer.

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