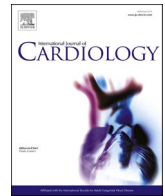




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Review

Cardiovascular disease prevention in the worksite: Where are we?

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ABSTRACT

The current guidelines of the European Society of Cardiology on cardiovascular (CV) disease prevention highlighted the importance of implementing coordinated set of action, including worksite, aimed at eliminating or minimizing the impact of CV disease and their related disabilities. Workplace wellness programs tend to focus on modifiable risk factors of non-communicable disease, such as nutrition, physical activity, and smoking cessation. However, nowadays, corporate wellness programs are still rare and incomplete, and usually received limited attention. This represents a big public health issue since company health and wellness interventions may provide an important opportunity to identify and manage CV risk. Given the increasing of employees' average age, a progressive shifting of retirement age and an increased number of chronic diseases, these preventive programs will increasingly represent key factors of both employee's health and economic strategies of companies in the near future.

1. Introduction

A formal and universally accepted definition for workplace wellness programs has yet to emerge, and the range of benefits offered under this label is broad. Worksites reflect a relatively controlled environment where many adults spend large part of their lifetime: worksites are for adults what schools are for children [1]. Linnan et al. defined comprehensive worksite health promotion programs' functions as follows: a) health education, b) supportive social and physical environments, c) integration into the organization's structure, d) links to related programs, like employee assistance programs, and e) worksite screening [2]. Nevertheless, programs aimed at prevention of cardiovascular (CV) disease in the working population are still rare and incomplete, and usually received limited attention [3]. Actually, company health and wellness interventions may provide an important opportunity to identify and manage CV risk, fostering healthy behaviors to counteract the detrimental implications of risk factors [4]. The current guidelines of the European Society of Cardiology on CV disease prevention have highlighted the importance of implementing coordinated set of actions, at individual or population level (including worksite) aimed at eliminating

or minimizing the impact of CV disease and their related disabilities [5]. In next years, companies will be facing an increase of employees' average age, a progressive shifting of retirement age and an increased number of chronic diseases. Moreover, in a world with more workers having chronic disease and an ageing workforce, preventive initiatives should also aim for maintenance of work ability among those with CV diseases. Furthermore, the complications related to the COVID-19 pandemic are making a better employees' health status and a physical fitness even more important than before [6,7]. All these factors will contribute to make corporate wellness programs key factors of both employee's health and economic strategies of companies.

The aim of the present commentary is to give an insight into scientific evidences, characteristics and examples of workplace wellness programs.

1.1. History and diffusion

Workplace wellness programs have become increasingly popular as employers have aimed to lower health care costs and improve employee health and productivity. One of the first workplace-based recreation and

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Table 1
Key components of a successful corporate wellness program.

Component	Details
Multidisciplinary model of care	Highly skilled team of registered nurses, nutritionists and fitness trainers certified in wellness coaching
Clinical program	Based on a biopsychosocial framework and including a sophisticated technological platform to enable individual coaching
Bidirectional referrals and communications with health care system	Clinical integration with primary care physicians
Use of integrative techniques	Providing high rates of employee engagement and active participation in one's own health
Continuous quality improvement	Supported by latest evidences, data analytics and medical theory

fitness programs evolved over a century ago in 1879, when the Pullman Company introduced such a program within its own athletics association. Sixty-two years later, in 1941, the National Employee Services and Recreation Association (NESRA) was founded, and from beginning, these programs were designed to slow rising costs caused by absenteeism and loss of productivity. In the late 1950s, the Pepsi Corporation established its physical fitness program, and in the 1960s, 1970s and throughout the 1980s, many other companies followed suit, a trend that has continued until today [3]. In 2018, 82% of large firms and 53% of small employers in the United States offered a wellness program, amounting to an \$8 billion industry [8–10]. These data highlight a growing trend since in 2006, 19% of companies with 500 or more workers reported offering wellness programs, while a 2008 survey of large manufacturing employers reported that 77% offered some kind of formal health and wellness program [11].

While in USA this is a well-settled idea, in Europe corporate wellness programs are not so diffused [12]. Currently, the most active organizations for promoting workplace health promotion are the European Agency for Safety and Health at Work, the European Network for Workplace Health Promotion and the Wellness International [12]; moreover, the European Heart Network contributes indirectly to this topic, identifying the most effective policies, measures, and programs for reaching out to and managing individuals at high risk of developing CV disease [13].

The idea of wellbeing in the workplace has multiple meanings across organizations and countries in Europe and no comprehensive surveys examining its exact prevalence and overall impact are currently available. An Italian survey (Med-Ex unpublished data) explored corporate wellness diffusion in a database of 685 companies, chosen for employees number (between 700 and 3000) and geographical location (in the most densely populated Italian regions). Only 40% declared to have corporate wellness programs, even if in terms of service agreements with external fitness and healthcare facilities. More than a half of them stated to not have these program, mostly due to lack of information, interest and high cost. This worrying scenario highlights the absence of worksite wellness culture in Italy.

1.2. What are the key components of a corporate wellness program?

Because there are no standards for employee wellness programs, the definitions, activities and execution of such programs can vary drastically and yield substantially different results.

These programs can be highly effective if they incorporate some key factors that proved to be components of successful programs (Table 1).

However, some important factors to consider are the care of different vulnerable occupational groups, the high level of complexity of these initiatives and the interdisciplinary work needed to perform these programs. Moreover, medical governance is fairly important to reach pre-established outcomes, since most of negative results come from

generic and commercial programs: therefore, a focused and heterogeneous plan of action is the key of a successful corporate wellness program.

1.3. Scientific evidence and cost-benefit results

The evidence for the prevailing principle today—that wellness programs can reduce health care costs and absenteeism in excess of program costs—has been established by several works [14–16]. A study evaluating the long-term association of an individually tailored employee wellness program with employees' health was able to demonstrate a lowering in individuals' 10-year CV disease risk score for almost half of participants at risk [14]. They also showed significant improvement in all modifiable risk factors, including smoking status, total cholesterol levels, high density lipoproteins, and blood pressure [14]. A meta-analysis which evaluated the return on investment (ROI) of these wellness programs found that health care costs fell by \$3.27 and absenteeism costs fell by \$2.73 for every dollar invested in a wellness program [15]. The Citibank Health Management Program reported an estimated saving of \$4.50 in medical expenditures per dollar spent on the program [16]. Public Employees Retirement System, Bank of America, and Johnson have similarly estimated sizable health care savings from wellness programs. A 2012 evaluation conducted by John Nyman and colleagues of the lifestyle management and disease management components of the University of Minnesota's wellness program found the two components together to generate an overall ROI of 1.76 [17]. The value of workplace wellness programs also comes from outcomes beyond financial or economic factors, such as physical and mental health, quality of life, perceived health status, and functional capacity [18]. Despite widespread adoption and several favorable studies, causal evidence of such programs' effects on health and economic outcomes has been limited [19]. Workplace health promotion and corporate wellness programs have often proved to be challenging [20], without clear evidence for health benefits, particularly in low-risk participants. Indeed, these subjects are often excluded from health promoting programs due to an apparently satisfactory fitness profile, perceived as not requiring a further encouragement or improvement. This aspect represents one of the limitations to implement such projects inside companies. While meta-analyses have produced varying estimates of benefits relative to costs, studies have often been limited by a lack of valid control groups, selection bias, and small samples [10,11,20]. Moreover, experimental studies of comprehensive wellness programs have been scarce and have produced mixed results, with most of the more rigorous studies now dated [21]. For example, Mattke et al. [22] which pooled >300.000 employees from five employers, found that lifestyle management programs can achieve improvements in risk factors, such as reductions in smoking, and increases in healthy behavior, such as exercise. The study, however, did not find that lifestyle management programs achieve statistically significant reductions in health care costs. Similar doubtful results have been found by other authors [23,24]. Jones et al. [19] did not find significant causal effects of workplace programs on total medical expenditures, other health behaviors, employee productivity, or self-reported health status after more than two years. Probably different factors contribute to these results.

Probably different factors contribute to these conflictual results. For example, the setting where these studies were conducted may act as a main factor: in places where no national health system exists, corporate wellness programs may have a much higher impact than in countries where the access to health prevention programs is guaranteed even outside the workplace.

Therefore, there is the need of high-valued scientific works about this issue.

Table 2

Characteristics of the study population observed at the beginning and after 4 years of the Med-Ex corporate wellness program (adapted from [27]).

Variables	Baseline (n = 168)	4-years follow-up (n = 168)	p value
Age (years)	30.8 ± 5.9	34.7 ± 6.6	*
BMI (kg/m ²)	23.9 ± 2.6	23.1 ± 2.0	*
Smokers active (%)	14	13	Ns
Total cholesterol (mg/dL)	186.3 ± 25.2	170.1 ± 20.2	*
LDL cholesterol (mg/dL)	110.0 ± 23.3	100.0 ± 18.7	*
Triglycerides (mg/dL)	94.1 ± 51.0	84.5 ± 38.0	0.004
Resting HR (bpm)	60 ± 13	57 ± 11	0.0015
Systolic BP (mmHg)	122 ± 10	114 ± 10	*
Diastolic BP (mmHg)	76 ± 7	73 ± 7	*
FFM (%)	84.5 ± 7.9	84.7 ± 8.7	Ns
FM (%)	15.5 ± 7.8	14.9 ± 7.1	Ns

BMI: Body Mass Index; HR: heart rate; BP: blood pressure; FFM: fat free mass; FM: fat mass.

* <0.0001; Ns: non significative.

1.4. An example of a European model of corporate wellness program: the “Med-Ex experience”

The Med-Ex, Medicine & Exercise, founded in 1994, is the official medical partner of the Scuderia Ferrari (Maranello, Italy) and manages all medical activities of employers, both in factory and in car competitions worldwide (such as Formula 1 championship). Since 2004, the “Ferrari Formula Benessere” program provided an on-site yearly free-of-charge medical screening including: medical history, physical examination, blood pressure measurements, 12-lead resting and stress testing ECG, glucose and lipid profile (total, HDL, LDL cholesterol and triglycerides), Body Mass Index (BMI) and body composition (bio-impedance analysis) assessment. A nutritionist provided personalized dietary advices to the employees. A tobacco-cessation counseling was offered. If necessary, second-line specialist visits were planned. Subjects considered eligible were encouraged to participate in a supervised physical exercise program in a fitness center located within the corporate headquarter. The effectiveness of this program was previously documented by a significant reduction of blood pressure, total and LDL cholesterol levels as well as BMI, associated with an increase of cardiorespiratory fitness, through a mass use of exercise stress test [4,25,26] (Table 2).

These results, mainly obtained with lifestyle intervention, have an important preventive value because young populations, such as those of the companies, are usually unmonitored about the presence of CV risk factors at the population level and these projects, indeed, increase the possibility to apply the effective primary CV disease prevention at early stage.

Moreover, a “drag effect” among employers was detected with a constant and progressive increase in the number of participants over time [27]. Unfortunately, the project had only a mild and not significant impact on the percentage of smokers. Probably, the already low percentage of smoking users present in the company at the beginning of the project (14%), far below the Italian average (21%), has compromised the possibility of a more concrete smoke reduction.

During the last years, the “Med-Ex model” was extended to other national factories, located in several Italian regions, including thousands of apparently healthy and working subjects. Partnerships between Med-Ex and other medical scientific societies and some Italian Universities have been initiated, including the corporate wellness programs among the training activities of medical residents and allied health professionals [25,26,28].

2. Conclusions

Although published evaluations yielded mixed results, corporate

wellness programs, if properly organized and conducted, can represent a key strategy for primary and secondary cardiovascular disease prevention at the population level, anticipating therapeutic strategies and reducing clinical inertia.

We would like to conclude this commentary with the words of Andreas Holtermann [29]:

“In a time of pandemic and financial crisis, business and the society need a productive, fit and healthy working population. Health-promoting physical activity programs at the workplace can be key to fulfil this need. To succeed, we encourage researchers and practitioners to design and implement workplace health-enhancing physical activity so they gain sustainable organizational support, have potential for scale-up and hence have an impact on workers’ health”.

Declaration of Competing Interest

None to declare.

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