



ORIGINAL ARTICLE

The Workplace Health Promotion (WHP) programme in an Italian University Hospital

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Keywords

Health promotion • Workplaces • Chronic diseases • Risk factors • Evaluation

Summary

Introduction. Description of the lifestyles of employees of the Siena University Hospital (Azienda Ospedaliera Universitaria Senese: AOUS), as assessed through a Workplace Health Promotion (WHP) project in the two-year period 2017-18; assessment of possible short-term effects of integrated health promotion interventions in the workplace, within the framework of the Tuscany WHP network, as applied in the AOUS and involving about 1,000 workers.

Methods. A cross-sectional study and a pre-post evaluation of data collected by means of anonymous questionnaires in two phases: before the beginning of the programme and after 12 months.

Results. Twelve months after the start of the programme regarding diet (consumption of fruit and vegetables) and physical activity, the positive effects that emerged were not statistically significant. No differences were observed between gender or profes-

sional categories. The employees' perception of the programme was satisfactory.

Conclusions. Albeit within the methodological limits of the assessment, the results showed that the diffusion of some major risk factors for chronic diseases had not decreased after 12 months' exposure to the programme. However, monitoring of these risk factors needs to be continued over a longer period, in order to detect the appearance of the expected changes in the long term. Moreover, it is essential to continue monitoring by sex and professional category, in order to pick out any differences and, if possible, take remedial actions. Further studies, in collaboration with the pertinent physicians, are desirable, since integrating data collected during health surveillance with a limited set of indicators of general risk factors may help to promptly identify possible health needs among employees.

Introduction

Workplace Health Promotion (WHP) programmes are coordinated strategies for promoting the health of workers; they include policies, environmental support and activities in the workplace that are aimed at fostering the adoption of behaviours conducive to well-being [1]. The WHP project differs from programmes of health and safety in the workplace, in that the latter focus on the prevention of injury, while the WHP is aimed at preventing non-communicable, lifestyle-related diseases [1]. Owing to the shortage of controlled studies in this area, and to the heterogeneity of the interventions assessed, good levels of evidence have not yet been reached. Nevertheless, in recent years, evidence of the efficacy of some health promotion interventions in working environments (WHP) has grown [2-8]; these initiatives have been particularly effective in reducing general risk factors for health and absenteeism due to illness [9]. Moreover, some of these risk factors, such as smoking, alcohol consumption and behaviour while driving vehicles, are also closely connected with work-related risks; they might therefore be better controlled if tackled both from the point of view of safety at work and from that of health promotion [10].

It is very difficult to evaluate complex programmes. However, the best results are achieved when the proposed

interventions are supported by evidence of efficacy, when several risk factors are tackled (multicomponent programmes) over a medium-long period, when interventions are integrated with programmes to promote safety, and when significant modifications are introduced into the working environment [11-13], as in the case of the WHP project. As testified by the literature, the benefits accruing to employees of the companies participating in the WHP project include a lower risk of non-communicable diseases and an improvement in healthy practices (e.g. physical activity and eating habits) [14-18]. In addition, the companies themselves benefit in terms of improved market value [19] and returns on investments [15, 20]. Evidence of the impact of WHP on productivity is mixed; a recent review [21] was inconclusive, while a meta-analysis found limited benefits for health and productivity [22]. It should, however, be pointed out that the *Return On Investment* (ROI) utilised in studies conducted in North American companies cannot be directly transferred to the Italian setting, in which the benefit yielded by a reduction in absenteeism due to illness can be expected, while the benefit of insurance savings cannot. Clearly, the evaluation of such programmes is problematic [23]. A systematic review conducted in 2013 [24] identified 307 studies that had assessed WHP programmes, only nine of which were deemed to be of good methodological

quality, and only seven used adequate methods to evaluate the efficacy of the interventions. Nevertheless, a recent meta-analysis [25] of the efficacy of single WHP interventions concluded that the evidence accumulated over the last three decades indicated that programmes which were well designed, well implemented and based on the principles of evidence could yield positive outcomes in terms of both economy and health.

With regard to the implementation of effective interventions, certain limitations of the currently available evidence-based indications have been identified: the absence of operative indications, the lack of a standardised reproducible model of intervention, and the lack of adaptation of these interventions to the Italian setting [11].

The aim of the present study was to analyse the first results of the WHP project in the University Hospital of Siena (AOUS) after application of the programme for 12 months, by comparing the diffusion of risk factors before and after implementation of the interventions, with a view to determining whether changes in the risk profile of workers had already taken place in the short term.

Methods

THE TUSCANY REGION'S WHP

The Tuscany Region is currently running a structured, multicomponent, standardised *WHP programme* (*Workplace Health Promotion*: <http://www.regione.toscana.it/lavoraresicuri/whp>) based on a pathway of free accreditation for companies that adopt good practices for the control of the main risk factors for chronic non-communicable diseases. Designed and tested by the *European Network Workplace Health Promotion* (ENWHP) [26], this system has been adopted by the Tuscany Region, which in 2016 adhered to the programme through the Regional Council's resolution n. 1078 2/11/2016. The Tuscany Region's programme of health promotion in the workplace was recognised by the ENWHP as a model of good practice, both because it was in line with the Luxembourg Declaration and because it was deemed to contribute to the diffusion of a new culture of health and safety in the workplace.

Organisations that take part in the Tuscany Region's WHP can apply to join the ENWHP and, if they can demonstrate that they have fully implemented the provisions of the regional programme, can obtain certification by the network.

The good practices required are enacted by the companies themselves through the use of internal resources and with consultation and monitoring by the personnel of the pertinent Local Health Authorities. Each year, the companies choose two different topics (from the 6 proposed: Diet, Smoking, Physical Exercise, Alcohol and Addiction, Road Safety, and Well-being and Life-Work Reconciliation). In each of these areas, they are required to implement at least three "good practices",

which are chosen from among those listed in a specific manual [27] (q.v. for a detailed description of the individual interventions proposed). The WHP manual is equipped with numerous annexes that refer the reader to instruments, materials and contents drawn up by national (Ministry of Health, National Health Institute, "Gaining Health" Campaign...) and international (WHO, EU - Occupational Safety and Health Administration, ENWHP) institutions. The good practices suggested include both interventions supported by solid evidence and initiatives aimed at communication and raising awareness. The sixth topic area of the program, "Well-being and Life-Work Reconciliation", encompasses a wide variety of initiatives, all of which help to improve quality of life, but the results of which are difficult to measure in terms of health. The programme includes a monitoring system, which enables indicators to be produced on the basis of anonymous questionnaires administered to employees at different time-points. In the AOUS, where testing of the programme started in 2016, a total of about 1,000 employees were recruited, which corresponds to over 40% of the entire workforce. In 2018, the data-collection system first yielded enough information to enable comparison of the diffusion of the main risk factors among the workers who had participated in the programme for at least 12 months. The aim of the present study was to assess any tangible short-term effects of this programme of health promotion in the workplace.

STUDY DESIGN

The study entailed a randomised pre-post comparison of indicators recorded after the implementation of specific interventions for health promotion. The data were gathered by means of a self-administered, anonymous, internationally validated, online questionnaire.

Before proceeding to fill in the online questionnaire, the participants gave their consent to the use of the data in aggregate form. The judgement of ethical propriety was provided by the Ethics Committee of the Local Health Unit Tuscany South-East.

INSTRUMENTS

The comparison was carried out on the aggregate data on the diffusion of risk factors among the workers. The questionnaire comprises 35 items concerning: sex, age, occupational level, anthropometric parameters (weight, height), habitual level of physical activity, eating habits, smoking, road accident risks, consumption of alcohol and other drugs, and the quality of relationships with family members, colleagues and superiors. The text of the questionnaire is available online [27]. The anthropometric parameters (weight, height) are self-reported. The duration of exposure to the interventions contained in the programme was 12 months.

INCLUSION CRITERIA

The sample population is very heterogeneous, consisting of subjects from several healthcare, medical, technical and administrative professions. For this reason, any

differences among the various categories of workers will be taken into account in the analyses. Online administration of the questionnaire was publicised by means of both the internal newsletter and e-mail contacts with employees on the hospital mailing list; potential respondents were informed that they could participate in the project within a one-month period, starting from a specific date. During this one-month period, two reminders were sent to those on the mailing list, to encourage participation. All those who accessed the website through the link provided, and who gave their consent to participate, were enrolled in the study. On a total population of about 2,400 employees, 968 completed the pre-intervention questionnaire, and 1,108 completed the post-intervention questionnaire. The number of participants and the random nature of their participation ensure that the sample is representative.

INTERVENTIONS IMPLEMENTED

Diet

First good practice

In the refectory, fresh fruit and vegetables were made available at least three days a week, and notices were posted to publicise the “Tuscan Dietary Pyramid” (Piramide Alimentare Toscana, PAT), the IARC guidelines, instructions for calculating Body Mass Index (BMI) and material regarding the project “Anche al lavoro... e vai con la frutta - Eat fruit even in the workplace” [28].

Second good practice

The refectory staff was specifically instructed as to the correct sizes of portions to serve, and notices indicating the appropriate quantities of food were posted in the refectory. Employees were also informed about portion sizes through the hospital’s official communication channels (leaflets in wage packets, hospital newsletter and mailing list, and a page devoted to the project in the intranet network).

Promotion of physical activity

Third good practice

Notices encouraging the use of the stairs were posted in lifts; promotional posters (at least 1 for every 60 workers) were affixed in highly frequented areas; and messages were circulated in wage packets (at least 3 per year) and in the hospital newsletter and mailing list. BMI was calculated by applying the formula: body weight (kg)/height (m²) and was analysed both as a continuous and as a categorical variable. According to the World Health Organization Growth Reference, normal-weight participants have a BMI between 18.5 and 24.9 kg/m², overweight participants have a BMI between 25.0 and 29.9 kg/m², and obese participants have a BMI of 30.0 kg/m² or greater [29]. Sedentariness was assessed by means of specific items in the questionnaire. As an indicator of result, we used

the proportion of individuals who stated that they hardly ever engaged in physical activity outside working hours (multiple-choice item); the option “outside working hours” was used because it describes the amount of physical activity that depends directly on the individual’s volition.

STATISTICAL ANALYSIS

The results of the questionnaires completed in 2017 and 2018, on the two groups of employees, were initially analysed by means of descriptive techniques, in order to ascertain the main characteristics of the respondents. We then carried out an analysis aimed at assessing the homogeneity of the groups of respondents in the two years with regard to their main personal characteristics (sex, age, BMI, class of nutritional status and profession). In the third phase of the statistical analyses, we compared the propensity to consume some types of foodstuffs (fruit, vegetables, sweet foods and sweetened beverages) and the propensity to engage in physical activity (at work, outside work, and the overall number of hours of physical activity) between 2017 and 2018. These comparisons were made by means of non-parametric tests of the hypotheses. Specifically, Fisher’s exact test and the chi-square test were applied to qualitative variables, while the Mann-Whitney test was applied to quantitative variables, once the assumption of normality of distribution had been excluded on the basis of the Shapiro-Wilk test. All of the above-mentioned comparisons were also carried out within the four professional categories into which the respondents were classified (physician, nurse, healthcare assistant, and “other professions”). The analyses were performed by means of IBM-SPSS® v. 23, and the level of significance was set at $p < 0.05$.

Results

In both years considered (2017 and 2018), the majority of respondents were females (70.0% in 2017 and 70.8% in 2018); this reflects the gender distribution of AOUS employees. The mean age of the participants was almost identical (47.6 years in 2017 and 47.2 years in 2018), as were BMI values and the prevalence of overweight/obese subjects (Tab. I).

The distribution of respondents in the various professional categories was also very similar in the two years: in 2018, the number of nurses who participated was slightly higher than in 2017, while subjects in the category “other professions” decreased. However, the differences recorded did not prove to be statistically significant, which testifies to the fact that in both years the respondents displayed equivalent characteristics. Table II shows the behaviour reported with regard to the consumption of some types of foods. Regarding fruit and vegetables, the percentage of subjects who reported a low consumption increased: those who never ate fruit, or who ate no more than two daily portions, increased from 62.6% in 2017 to 64.6% in 2018; those

Tab. I. Characteristics of participants in 2017 and 2018 (data are expressed as absolute values and percentages for qualitative variables, and as means and standard deviations for quantitative variables).

		2017	2018	Statistics	P
		(n = 968) (%)	(n = 1108) (%)		
Sex	Female	588 (70.0)	701 (70.8)	Fisher test	0.719
	Male	252 (30.0)	289 (29.2)		
Age (years)		47.59±9.42	47.18±10.16	Mann-Whitney, U = 410021.5	0.634
BMI class	Underweight	37 (4.4)	33 (3.3)	Chi-square, χ^2 (2) = 1.786	0.409
	Normalweight	500 (59.7)	609 (61.7)		
	Overweight/obese	301 (35.9)	345 (35.0)		
Profession	Physician	182 (21.16)	220 (21.9)	Chi-square, χ^2 (1) = 7.232	0.065
	Nurse	247 (28.72)	331 (32.9)		
	Social/health worker	93 (10.81)	118 (11.7)		
	Other	338 (39.3)	338 (33.6)		
BMI		24.25±4.16	24.24±4.22	Mann-Whitney, U = 4 10321.5	0.773

Tab. II. Propensity to consume some types of foods in the groups of respondents in 2017 and 2018 (data are expressed as absolute values and percentages).

		2017	2018	Statistics	P
		(n = 968) (%)	(n = 1.108) (%)		
Daily portions of fruit	From 0 to 2 portions	517 (62.6)	630 (64.6)	Fisher test	0.404
	3 or more portions	309 (37.4)	346 (35.5)		
Daily portions of vegetables	0 or 1 portion	211 (25.5)	285 (29.2)	Fisher test	0.090
	2 or more portions	615 (74.5)	691 (70.8)		
Weekly consumption of sweet foods	Never or once	337 (42.6)	387 (41.7)	Chi-square, χ^2 (3) = 1.482	0.686
	2 or 3 times	263 (33.2)	294 (31.7)		
	4 or 5 times	109 (13.8)	144 (15.5)		
	Every day	83 (10.5)	104 (11.2)		
Weekly consumption of sweetened beverages	Never or once	514 (75.0)	603 (76.6)	Chi-square, χ^2 (3) = 3.353	0.340
	2 or 3 times	112 (16.4)	114 (14.5)		
	4 or 5 times	29 (4.2)	25 (3.2)		
	Every day	30 (4.4)	45 (5.7)		

Tab. III. Physical activity in the groups of respondents in 2017 and 2018 (data are expressed as absolute values and percentages for qualitative variables, and as means and standard deviations for quantitative variables).

		2017	2018	Statistics	P
		(n = 968) (%)	(n = 1108) (%)		
Physical activity DURING work	None or less than 30 min	580 (73.0)	665 (72.3)	Fisher test	0.786
	At least 30 min almost every day	215 (27.0)	254 (27.6)		
Physical activity OUTSIDE work	None or less than 30 min	481 (59.6)	574 (61.5)	Fisher test	0.431
	At least 30 min almost every day	326 (40.4)	359 (38.5)		
Total hours of physical activity per week		6.3 ± 4.3	6.2 ± 2.7	Mann-Whitney, U = 380967.5	0.320

who never ate vegetables, or who ate no more than one daily portion, increased from 25.5% in 2017 to 29.2% in 2018. Analysis of the consumption of sweet foods and sweetened beverages revealed an opposite trend. Although the frequent consumption of sweet foods and sweetened beverages involved a minority of subjects within each group of respondents, the overall consumption of such products, especially sweet foods, seemed to have risen; indeed, the percentage of subjects who reported eating sweet foods four or more times per week increased from 24.3% in 2017 to 26.7% in 2018. In this case, too, the differences did not prove statistically

significant differences, indicating that dietary behaviour did not change over the two-year period considered. The consumption of these foodstuffs over the two years was also compared within each professional category and each BMI class; again, no significant differences emerged.

Over the two-year period, the propensity to engage in physical activity, both during and outside working hours, did not change (Tab. III). Specifically, while physical activity during working hours did not display any notable variation, such activity outside work declined slightly from 2017 to 2018; indeed, in 2018 the percentage of

subjects who did no physical activity, or did less than 30 minutes per day, was 61.5%, as against 59.6% in 2017. The total number of weekly hours devoted to physical activity was practically identical in the two groups. The statistical tests performed revealed that the differences observed between 2017 and 2018 were not significant. Likewise, no significant differences emerged between the two years when the results were stratified by professional category and BMI class.

From the second administration onwards, the questionnaire includes a few questions on the respondents' appreciation and perception of the interventions implemented by the company; these questions explore the participants' subjective assessment of the interventions on diet and physical activity, of the company's level of commitment, and of the utility of the programme. With regard to diet, it emerged that 63.0% of participants judged the interventions to be very or quite useful, while 37.0% thought that the company had done "a lot" or "enough". Similarly, 53.0% of employees stated that the interventions on physical activity were very or quite useful, and 26.0% judged that the company had done "a lot" or "enough" in this area.

The second aspect to be explored is the respondents' perception of improvement in their own habits with regard to diet and physical activity. In both spheres, many subjects reported a partial improvement. With regard to diet, the percentage of subjects who reported an improvement was higher than that of those who reported no change (31.0% vs 27.0%). By contrast, with regard to physical activity, the opposite pattern emerged: 37.0% stated that they had not changed their habits, while only 25.0% reported that they had.

Discussion

Evaluating health promotion programmes implemented in a very varied and heterogeneous setting – such as that of a hospital facility – is a decidedly complex task. Although many literature reports have indicated the efficacy of health promotion initiatives in the workplace [2-8, 30], a very recent systematic review of American trials found that the available evidence of the efficacy of such interventions was insufficient and inconsistent. Moreover, it was unclear whether such strategies were economically effective, or indeed whether they might even have unintentional negative consequences [31]. However, the limited number of studies identified suggests that programmes of this kind are still in their infancy, and that further research is required in order to obtain evidence of their efficacy. The *WHP programme's* data-collection system was not designed for the purposes of epidemiological research. Rather, it is, first of all, a self-assessment tool for the worker. Secondly, it is a system for the overall monitoring of the prevalence of risk factors for chronic diseases; as such, it can be used by companies to plan and assess their interventions.

As the data used are self-reported, most of the measurements display a certain degree of approximation. Moreover, in the field of health promotion, issues concerning the choice of indicators and the timing of measurements are somewhat complex and controversial. On the one hand, for example, a short-term change in behaviour does not necessarily mean that the behaviour will be maintained in the medium/long term. On the other hand, anthropometric parameters, such as mean BMI and the class of nutritional status, are very unlikely to change in the short period.

The chief limitation of this type of investigation, however, lies in the use of anonymous data, which precludes the analysis of intra-subject variations in risk factors. This markedly restricts the possibilities of analysis. However, notwithstanding these limitations, the results of our study deserve attention on account of the size of the samples analysed in both phases. Moreover, to our knowledge, few studies have been published on health promotion interventions in this type of company setting. The results presented seem to indicate that, in a context such as that of the AOUS, lifestyle improvements, in terms of healthier eating and increased physical activity, cannot be registered in the short term. Our evaluation indicates the need to identify new, evidence-based, good practices to be added to the list of interventions in those thematic areas in which positive changes have not yet been seen. However, it should be borne in mind that the interventions proposed to companies are mainly of an organisational (policy, procedures, regulations) or informative nature, and that, as such, their expected effects are limited, especially in the short term.

To the best of our knowledge, the present study is the first to be conducted in a university hospital in Italy. Others have been carried out in companies of different kinds, particularly in the Province of Bergamo [32]; this latter study found that positive early effects (after 12 months) were related to the consumption of healthier foods (fruit and vegetables) and to increased rates of smoking cessation, and that these effects were more evident among males and white-collar workers. An important step will be to monitor the trend in the distribution of risk factors over three or more years after the start of the programme and in an even larger number of employees. We therefore intend to continue to publicise this project throughout the hospital, in order to track its long-term effects. One clearly positive finding of this study was the approval expressed by the respondents, which reveals that workers are well aware of the importance of the themes raised.

A final important consideration concerns the collaboration of various professionals, and particularly that of the physicians charged with implementing health promotion programmes in the workplace. The possibility to utilise some data from employees' health records for research purposes, and the gathering of a few further data on general risk factors, would enable us to overcome the main limitations imposed by the use of anonymous questionnaires: i.e. the impossibility of monitoring intra-subject variations; low or variable rates of participation

in the survey, and the imprecision of self-reported or self-measured parameters (such as body weight).

Our hope is that, at the end of the three-year period, the WHP project will be implemented systematically, as the approval expressed by the respondents suggests that the interventions may prove efficacious in the long term; this outcome may be favoured by the creation of workgroups to deal with specific topics, thereby making the workers themselves an active part of the process of change.

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Conflict of interest statement

None declared.

Authors' contributions

Conceptualization: GL; Methodology: GL, FF; Statistical analysis: FF; Writing, review and editing: GL, FD, AP, RG, EV, VG, FF.

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