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Health Promotion Interventions in Occupational Settings: Fact-Finding Survey among Italian Occupational Physicians

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Abstract

Background: *Occupational Physicians (OPs) are essential for health promotion (HP) at the workplace, although their HP knowledge and perception are still under-searched.* **Methods:** *Between September and December 2022, the Italian Society of Occupational Medicine (SIML) – HP working group performed a cross-sectional survey on SIML-OPs aimed to address their approach, experience, strategies, and needs concerning HP plans.* **Results:** *A total of 336 OPs completed the questionnaire. Regarding HP's OP perception, this was reported as a social investment (34.45%) and shared responsibility for all the company's preventive figures (30.18%). Over half of the enrolled OPs declared to have been involved as HP plans' organizers (57.30%) or collaborators (54.80%) in the previous 5 years. The greatest percentage of organizers were in the younger age groups (40-59 years; 50%). Additionally, following a more limited number of companies, prevalently of medium-high dimensions, and more than 500 workers were positively associated with greater OP participation in HP initiatives. Promoting healthy lifestyles was the main target of the HP plans (88.64%). Interdisciplinary collaboration, OP training on HP procedures and information on the targeted population have been reported as effective issues to support an active engagement of OPs in HP.* **Conclusions:** *A general interest of the Italian OPs with respect to HP was demonstrated, however, information on the potential benefits of HP in workplace aligned with OP perceptions and needs seem necessary to successfully implement HP interventions.*

1. Introduction

In 1946, health was defined by the World Health Organization (WHO) as "A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" [1]. Forty years later, in 1986, the WHO Ottawa Charter for Health Promotion reported that "To reach a state

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of complete physical, mental and social well-being, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment" [2]. In this view, each individual should be able to fulfill his/her aspirations and needs in every field of life, including home, community, and workplaces.

In this perspective, it seems evident how workplace safety and health efforts should be focused not only on the prevention and protection from occupational risks, but also to promote the physical and mental health as well as the well-being of the workforce through a holistic "Total Worker Health® (TWH)" approach, as firstly proposed by the US National Institute for Occupational Safety and Health in 2011 [3]. This includes policies, programs, and practices that foster safer and healthier workplaces by addressing work organization, employment and supervisory practices, and workplace culture taking also into account the possible synergy between occupational risks, environment, lifestyles and personal conditions [4].

Thus, the TWH approach inevitably includes workplace health promotion (WHP) strategies to advance workers' well-being. In Italy, the first WHP model was conceived and applied in the Lombardia Region in 2013 and reached around 600 participating companies throughout the Region in 2020 [5]. It was based on the WHO model and aimed to adopt organizational changes in workplaces to make them favorable environments for the conscious adoption and diffusion of healthy lifestyles, contributing to the prevention of chronic diseases.

More recently, the Italian Ministry of Health included the TWH approach in one of the intervention lines of the National Prevention Plan (NPP) for the years 2020-2025: "Activation of technical tables for the strengthening of the overall health of the worker according to the Total Worker Health approach" [6]. In agreement with the TWH principles, the NPP pointed out that to achieve health-friendly workplaces, the involvement of all the preventive figures engaged in occupational health is necessary [7].

From this perspective, it emerges the crucial role of occupational physicians (OPs), in the design, implementation, and monitoring of TWH and HP interventions. This has also been underlined by article 25 of the Italian Legislative Decree 81/2008, which stated the role of the OP in collaborating to the implementation and valorization of voluntary programs of HP, according to the principles of social responsibility [8]. OP expertise in understanding possible health implications of exposure to occupational risks and the strong relationship with workers, supporting the deep knowledge about their health conditions, make the OP a key figure in implementing the health and well-being of the workforce in individual companies [7]. However, although recognized as an integral part of HP policies and programs in the workplace, the OPs' knowledge and perceptions regarding HP seem still an under-searched topic. Therefore, the present study aimed to address issues related to the approach, experience, strategies, and needs of OPs with respect to HP plans. This may be helpful to extrapolate insights that may assist OPs to more effectively generate interest and action to integrate occupational preventive and protective actions with improving employee health outcomes. This may strongly support workplaces to become safe, healthy, and sustainable with overall benefits for workers, employers, and the community.

This report summarizes the survey's main results, whereas additional details are provided in the Italian version of the report, which can be accessed as supplementary material including more numerous and detailed tables.

2. Methods

2.1. The Investigated Population and Data Collection

A cross-sectional HP survey was conducted between September and December 2022. Italian OPs attending the 84° National Congress of the Italian Society of Occupational Medicine (SIML), held in Genova, Liguria Region, from the 28th to the 30th of September 2022, were asked to participate in the survey completing the specifically targeted questionnaire. Additionally, OPs listed in the database of the SIML were also contacted by email and asked to respond to the same questionnaire via a Google form. In any case, voluntary and anonymous participation was assured by all the members of the SIML Working Group promoting the research program. Only those OPs actively

involved in occupational health activities in private or public enterprises, as stated by article 25 of the Italian Legislative Decree 81/2008 [8], were included in the study. No other exclusion criteria relative to socio-demographic and occupational features were applied.

2.2. Health Promotion Questionnaire

An exploratory questionnaire was developed by the Members of the SIML HP Working Group to collect information concerning the Italian OPs knowledge on HP and initiatives implemented to support the health and well-being of the workforce in different settings. It consisted in 28 items divided into multiple choices and open questions, that required at least 15 minutes to be completed. The questionnaire included a first section focused on the OP socio-demographic data, i.e., age, and regions of work, and the type of activity performed. This was aimed to explore the OP private or public operating sector, as well as the number and features of the enterprises in which they worked (i.e., economic sector, number of workers employed, occupational risks experienced). The HP knowledge was explored through questions concerning the experience that the individual OP had on the HP plans in companies, with respect also to the National and Regional initiatives, the role that these programs should have with respect to the occupational health and safety system, and the relevance of the employers as well as additional healthcare professionals and preventive figures in organizing and implementing such programs. The final section of the questionnaire was dedicated to investigating the engagement of the OPs in HP plans and their characteristics in terms of intervention targets, length of the programs, effectiveness, collaboration with other professionals involved in the health and safety at work, as well as formative needs for a more widespread development/implementation of the HP plans.

2.3. Statistical Analyses

Data are presented as frequency (percentages). The chi-square test for parametric distributions or Fisher's test for non-parametric distributions, as appropriate, were used to test for the difference among the specified groups in the questionnaire's responses. All analyses were performed using the statistical software R, version 4.0.3.

3. Results

3.1. Investigated Population

A total of 380 participants were enrolled; 164 OPs were enrolled during the national congress days, while the other 216 participated in the online survey. This seems a consistent sample with respect to the total number of SIML members (1900) and the number of members who declared to be directly employed as company OPs. The general characteristics of the investigated population are summarized in Table 1.

Males represented most of the sample (65%), and 64% of the participants had more than 50 years, with a different distribution of male and female subjects according to the diverse age groups (shown in supplementary material, p=<0.001): greater percentages of female OPs were ≤ 49 years (52%), while most of the male participants were in the ≥ 60 age group (53%). Of 380 respondents, 336 (88.4%) declared direct engagement in companies as OPs and completed the questionnaire.

Table 1. Sociodemographic characteristics of the population (N=380).

Study population	N	%
Gender		
Female	247	65.0
Male	133	35.0
Age		
< 30 years	10	2.6
30-39 years	65	17.1
40-49 years	62	16.3
50-59 years	87	22.9
>= 60 years	156	41.1
Area of Residence		
Northern Italy	191	50.5
Central Italy	108	28.6
Southern Italy	79	20.9

This number represents more than a half (57%) of the SIML OPs, and 7% of the Italian OPs (4652) who transmitted to the competent local services in 2022, the aggregated health and risk data of the workers subjected to health surveillance according to the article 40 of the Legislative Decree 81/2008, Annex 3B. Gender differences have been determined concerning the professional activity performed (p=0.006). A greater portion of female professionals (18%) declared to have not been directly engaged in companies as OP than the male ones (8.1%). About half were from Northern Italy, about 30% from Central Italy, and the remaining 20% from Southern Italy. Regions of residence included Lombardia (14.8%), Toscana (11.1%), Piemonte (10.3%), Lazio (9.3%), Campania, and Emilia Romagna (both 7.4%).

Table 2. Professional activity features of the investigated population.

Professional activity characteristics	N	%
Year of Profession's Beginning		
< 1996	106	34.0
1996-2005	104	33.3
2006-2015	53	17.0
> 2015	49	15.7
Area of Professional Activity		
Northern Italy	244	53.9
Central Italy	111	24.5
Southern Italy	98	21.6
Type of Professional Activity		
Freelance	224	66.9
Employee	56	16.7
Employee/consultant of a public facility affiliated with the employer	94	28.1
Employee/consultant of a private facility affiliated with the employer	41	12.2
Enterprises where OPs Perform Their Activity		
< 10 enterprises	145	43.7
10- 25 enterprises	53	16.0
26- 50 enterprises	43	13.0
>50 enterprises	91	27.3
Employees in Enterprises Where OPs a capo Perform Their Activity		
< 10 employees	44	13.2
11- 49 employees	107	32.0
50- 249 employees	63	18.9
>249 employees	120	35.9
Workers per OP		
< 50 workers	12	3.6
51- 100 workers	13	3.9
101- 500 workers	53	16.1
501- 1000 workers	62	18.8
1001- 1500 workers	30	9.1
>1500 workers	160	48.5
Economic Sector		
Agriculture, forestry and fishing	82	6.0
Mining from quarries and mines	20	1.5
Manufacturing activities	199	14.5
Supply of electricity, gas, steam	35	2.6
Water supply, sewerage networks, waste management	129	9.4
Construction	111	8.1
Wholesale and retail trade. car/ motorcycle repair	48	3.5
Transportation and storage	93	6.8
Accommodation and catering service activities	117	8.5
Information and communication services	41	3.0
Financial and insurance activities	40	2.9
Real estate activities	7	0.5
Professional, scientific and technical activities	38	2.8
Rental, travel agencies, business support services	10	0.7
Public administration and defense; compulsory social insurance	78	5.8
Instruction	75	5.5
Health and social assistance	152	11.1
Artistic, sports, entertainment activities	16	6.0
Other service activities	82	6.0

OP, occupational physician.

3.2. Professional Activity Characteristics

Professional features of the investigated population are reported in Table 2. Most participants (2/3) started their OP profession before 2005, while smaller portions started in the 2006-2015 period and after 2015. Freelancers characterized the majority of the enrolled population (66.87%). In line with the residence data, about half of OPs performed their professional activity in Northern Italy. Concerning the number of the followed companies, more than 40% performed their professional activity in less than 10 enterprises. More limited percentages were engaged with a greater number of companies.

As many as 27.4% were involved in more than 50 enterprises, respectively. A significant different gender related distribution (p=0.003) was determined with respect to the number of companies where the OP attended his/her professional activity (Table S2). A greater percentage of female OPs were engaged with less than 10 enterprises (57%) compared to the male ones (37%). Conversely, a lower percentage of females (6.5%) were employed in 26-50 enterprises compared to males (16%). In general, the companies where OPs worked were small (32.0% with 11-49 employees) or big ones (35.9% with > 249 employees).

More than half of the recruited OPs followed > 1000 workers. The most represented sectors were manufacturing activities, health, social work, water supply, sewerage, waste management, accommodation, food service activities, and the construction sector. Occupational risk factors were primarily the use of video display terminals, the manual handling of loads, biomechanical overload of upper extremities, chemical risk factors, and night shift work.

3.3. Health Promotion Approach

Occupational physicians were firstly asked about their opinion on the role of HP plans in occupational settings (Table 3).

They indicated that HP programs represent a social investment (34.5%), and a shared responsibility with all the figures involved in companies' preventive actions (30.2%). More limited percentages of

Table 3. Perception of HP among the investigated OP population.

HP perception	N	%
Definition best describing the aims of occupational HP programs?		
A moral duty towards workers	41	12.5
A shared responsibility with the prevention figures	99	30.2
An added value	63	19.2
A social investment	113	34.5
A regulatory obligation	12	3.7
Which of the following HP programs do you know?		
Total Worker Health (NIOSH - Centers for Disease Control and Prevention)	133	40.2
Healthy Workplaces (World Health Organization)	118	35.7
National Prevention Plan	185	55.9
Regional Prevention Plans	160	48.3
Other	10	3.0
None of the previous programs	54	16.3
Have you been involved in any of the HP interventions listed above?		
Yes	111	33.4
No	221	66.6

Table 3 (*Continued*)

HP perception	N	%
Degree of agreement with the following statements concerning HP:		
1. The enactment of Legislative D 81/08 increased occupational HP programs		
Do not agree at all	25	7.5
Disagree	89	26.6
Quiet agree	163	48.7
Very much agree	39	11.6
Totally agree	19	5.7
2. Occupational HP should be included in protocols aimed to protect workers' health		
Do not agree at all	2	0.6
Disagree	8	2.4
Quiet agree	66	19.6
Very much agree	138	41.1
Totally agree	122	36.1
3. Occupational HP programs should involve General Practitioners & other specialists		
Do not agree at all	3	0,9
Disagree	7	2,1
Quiet agree	92	27,4
Very much agree	136	41,0
Totally agree	98	29,2
Employers' interest in implementing HP programs is:		
Insufficient	27	8.1
Poor	113	33.7
Sufficient	108	32.2
Good	76	22.7
High	11	3.3

HP, health promotion.

the respondents declared HP was an added value for occupational health (19.2%), a moral duty towards the workforce (12.5%), or a regulatory obligation (3.7%). Concerning the OP knowledge regarding international, national or regional Italian initiatives on HP, about half of respondents declared to know the NPP of the Ministry of Health 2020-2025 (55.9%) and the Regional Prevention Plans 2020-2025 (48.3%). The TWH® proposed by the NIOSH and the Healthy Workplaces promoted by the WHO were known by the 40.2% and 35.7% of the OPs. However, only 33.4% had been involved in one of these interventions, without significant gender or age-based differences.

The Italian Legislative Decree n. 81, in 2008, among the OP mandatory duties (article 25), stated that the "OP collaborates in the implementation and valorization of voluntary programs of HP, according to the principles of social responsibility" [8]. In this perspective, the questionnaire included an item relative to the participants' agreement concerning a possible increase of HP programs following the issuance of the Decree mentioned above. A quiet agreement was expressed by 48.7% of the respondents about the effectiveness of such legislative intervention in increasing HP initiatives at the workplace, without gender-related differences, the number of workers employed in the enterprises where the OPs performed

their professional activity (≤ 49 vs. > 49 employees), the number of followed workers (≤ 500 vs. > 500 workers) or concerning be or not to be involved in organizing or collaborating to HP programs. Only 7.5% did not agree at all with this statement.

Additionally, almost all participants agreed on the fact that occupational HP programs should be intended as an integral part of the preventive and protective system aimed to ensure the psycho-physical health and safety of workers. There were no differences between males and females or depending on the number of workers employed in the enterprises where the OPs performed their professional activity, the total number of followed workers and the involvement as organizers or collaborators of HP initiatives. These plans should be supported by other healthcare professionals, such as general practitioners and specialists in other disciplines, as strongly agreed by 40% of the total respondents, without significant differences related to gender, the size of the companies, the number of followed workers or the direct engagement in HP plans as organizers or collaborators. OPs were asked about the interest expressed by employers, which was reported as insufficient by 41.8% of respondents, while most of the group (58.2%) considered it sufficient up to high. A different distribution was determined in such response between male and female professionals, as more female OPs (41%) reported a sufficient employers' interest compared to the 28% of the male subjects. Moreover, also a different distribution in the responses was determined for being or not being involved as organizers of HP plans ($p< 0.001$). Among OPs directly engaged in organizing HP initiatives, the percentage of those reporting at least a sufficient interest in employers was greater than those not involved in such activity (64.2% vs. 50.7%, respectively). No significant differences were reported for being involved in HP collaborations, the size of the enterprises, and the number of followed workers.

3.4. Participation in Health Promotion Plans

As regards the involvement of the OPs in HP programs at the workplace during the previous 5 years, 57.3% and 54.8% declared to have been involved as organizers or collaborators, respectively (Table 4).

A significantly different age-related distribution could be demonstrated in this item. The greatest percentages of OPs involved as organizers in such initiatives, in fact, were in the 40-49 (21%) and 50-59 (29%) aged groups, compared to those of a comparable age that did not organize HP strategies, 13% and 20%, respectively. Such differences failed to emerge when HP collaborative efforts were explored. Gender related discrepancies in organizing or collaborating to HP strategies were not demonstrated. When the organization of the HP plans was analyzed according to the characteristics of the OP activity, i.e., the number and size of companies in which they performed their activity, and the number of supervised workers, significantly different distributions of respondents could be determined. A greater proportion of professionals engaged in less than 25 companies, with medium-high dimensions (>49 workers) and following more than 500 workers was engaged in HP organization. Comparable results were obtained with respect to the collaboration in HP plans, with significant results obtained for OPs engaged in larger enterprises and with a greater number of followed workers.

In general, the organization of HP plans was supported by the employers (62.0%), the preventive and protective service of the company (60.5%), the human resource staff (45.1%), the workers' representative for safety (43.2%), the workers themselves (34.2%), as well as by the operators of the prevention departments of the local health authorities (20.7%). No significant differences in this regard emerged with respect to have been organizing or collaborating in HP plans, as well as with respect to the size of the companies where the OP activity was performed or the number of followed workers.

As declared by most of the participants (88.6%), the areas of intervention were oriented towards the promotion of healthy lifestyles, such as good nutrition, avoidance of voluptuary habits, physical activity promotion and sleep hygiene. Lower percentages of OPs were engaged in programs aimed to promote the workers' psychological well-being (37.1%), a comfortable working environment (24.2%), as well as a better home-work relationship (11.7%). The

Table 4. OP participation in HP plans.

Participation in HP plans	N	%
In the last 5 years, did you organize HP interventions?		
Yes	192	57.3
No	143	42.7
In the last 5 years, did you collaborate in HP interventions?		
Yes	183	54.8
No	151	45.2
What areas of intervention are your HP programs focused on?		
Promotion of "healthy" lifestyles (nutrition, voluptuary habits, physical activity, sleep hygiene)	234	54.8
Promotion of workers' psychological well-being	98	23.0
Promotion of a comfortable working environment	64	15.0
Promotion of a better home-work relationship	31	7.2
How long did the HP interventions last?		
A day or less	64	24.0
Some days	65	24.3
A few months	65	24.3
A few years, then interrupted	12	4.5
A few years and still ongoing	61	22.9
How do you evaluate the workers' participation?		
Insufficient	6	2.2
Poor	40	14.7
Sufficient	102	37.4
Good	105	38.4
High	20	7.3
How do you evaluate the HP interventions' effectiveness?		
Not effective at all	..	..
Not very effective	46	17.3
Quiet effective	174	65.5
Very effective	39	14.6
Completely effective	7	2.6
Have effectiveness indicators been adopted?		
Yes	180	66.7
No	48	17.8
I don't know	42	15.5
A prominent role in HP interventions was played by:		
Employer	165	23.3
Personnel/Human Resources Manager	120	17.0
Prevention and Protection Service	161	22.8
Workers' Safety Representative	115	16.3
Workers	91	12.8
Operators of the Department of Prevention	55	7.8

Table 4 (*Continued*)

Participation in HP plans	N	%
To implement occupational HP interventions, you suggest:		
Collaboration between different disciplines of the healthcare sector	222	72.1*
Information on the population to be targeted by the intervention	133	43.2*
Training of OPs on HP procedures	195	63.3*
Adequate funding	160	52.0*
Contractual provision of an economic recognition of the OP	104	33.8*
More time available	122	39.6*
Evaluation of the quality of HP programs	123	39.9*
Evaluation of the effectiveness of HP programs	174	56.5*

**Multiple choices account for the sum of percentages exceeding 100; HP, health promotion; OP, occupational physician.*

length of the HP interventions was of one day or less up to few days in 48.3% of cases and of some months in 24.3%. The programs that had a length of some years, were still ongoing at the time of the survey or were interrupted in the 22.9% and 4.5% of cases, respectively. In most cases (75.8%), OPs reported a sufficient or good voluntary participation of the workforce, without gender related differences, which was described as insufficient only by a limited percentage (2.2%) of the participants. When OPs were asked to indicate the percentage of the workforce that participated in such HP plans, 54.3% of them declared that more than a half of the company employees chase to take part into such interventions. As concerns the effectiveness of such initiatives, these were reported as quiet, very or completely effective in the 65.4%, 14.7% and 2.6% of the responses, respectively. A more limited percentage of responses described these interventions as not very effective (17.3%). Efficacy indicators were adopted in 66.7% of cases.

Another key issue explored by the questionnaire regarded the OPs perceived needs concerning the aspects that may be useful to implement the application of HP strategies in occupational settings. Among those, the collaboration between different healthcare disciplines was the most frequently reported (72.1%), followed by the specific training of OPs on HP procedures (63.3%) and the adoption of suitable methods of evaluation of the effectiveness of HP programs (56.5%). Additionally, adequate funding (52.0%), and appropriate information on the target population (43.2%), as well as a suitable quality assessment of the programs (39.9%) have been also indicated as useful means to promote their wider application. From the perspective of the OP involved in such initiatives, to have more time available (39.6%) and a contractual provision for a financial recognition of the HP required efforts (33.8%) could also represent a possible incentive to disseminate HP interventions.

4. Discussion

A healthy, safe, and productive working life is the essence of a modern and sustainable workplace [9]. In this view, key elements are improving the working environment and adopting different workplace HP initiatives to ensure the employees' well-being. The WHO prioritizes the workplace for promoting health and well-being [10]. Workplaces appear ideal for this purpose [11], providing access to a sizable segment of the adult population who spend many waking hours at work. In the United States, the Total Worker Health® program of the NIOSH sought to improve the workforce's well-being by protecting their safety and enhancing their health, motivation, and productivity. Although, in this scenario, "occupational health and safety," codified in regulations, encompasses efforts that prevent injury or illness due to workplace-specific risk factors by conducting safety training, environmental modification, and the provision of and use of collective and personal protective equipment, "health and wellbeing in the workplace" can be viewed as a broad concept comprised of personal satisfaction, work-life satisfaction, and general health [12, 13].

Many stakeholders can share an interest in HP in occupational settings ranging from employers and employees, OPs, various government departments, trade unions, universities, and organizations with a health-promoting focus. However, although essential in HP, the position and needs of OPs have still not been fully explored. In this perspective, the present study represents the first attempt to investigate the perceptions of a representative sample of Italian OPs concerning HP. Notably, while the retrieved findings are most applicable to the Italian-specific context, they may also have relevance for international settings, given the general applicability of the HP and the growing trend towards implementing health and wellbeing programs in the workplace.

In general, one-third of our investigated OP population intended HP as a social investment in workplaces, in line with the idea of the workplace as an optimal setting to support the promotion of the health of a large proportion of the working population and with the reported effectiveness of such initiatives at the community level [14, 15]. HP plans have been demonstrated effective in preventing and controlling chronic diseases, reducing the exit from the workforce and health care costs while increasing workplace productivity and promoting active aging of the employees [16]. Almost all the OPs agreed that HP programs should be considered an integral part of the workplace health and safety preventive and protective systems. In this view, a third of the respondents saw HP as a shared responsibility of all the preventive figures in the workplace. In some cases, the employers' interest was reported as insufficient, which may be because while the employer's responsibility regarding occupational health and safety is of evident importance and often legislated, the HP lines are somewhat blurred and discretionary about activities covered under the broader topic of health and wellbeing [12]. However, it seems important to note that OPs reporting at least a sufficient interest of the employers towards HP plans were also those most frequently engaged in organizing such initiatives, supporting the key role of all the workplace preventive figures' collaboration in successful HP strategies. In this view, it cannot be excluded that the OPs reporting an insufficient interest from the employers could be those who performed their activities in micro-small companies, where it was more challenging to carry out the HP plan because of limited resources, higher numbers of casual/part-time workers, and small numbers of permanent employees [11, 17]. In this setting, the contributing role of social parties and trade unions would be desirable to overcome such difficulties and favor a wide diffusion of HP policies and programs. Establishing collaborations with neighboring businesses and developing HP plans with local health authorities' support may be effective measures to create or implement joint HP programs, particularly in small and medium enterprises. Additionally, applying for grants or funding opportunities sponsored by charities or governmental organizations may help small companies implement HP initiatives.

The respondents strongly agreed upon an interdisciplinary approach to HP because this may help achieve a comprehensive approach to the initiatives' other health and wellbeing targets. These focused on healthy lifestyles and risk factors requiring expertise in different medical disciplines. Concerted action between different types of healthcare professionals, general practitioners, and hospital services is important to achieve effective HP interventions relying on existing resources, such as local health clinics, to provide health education and screenings that may positively impact the occupational and general health of the workforce.

Concerning the practical engagement in organizing or collaborating with HP plans, about half of our sample reported to have been directly involved, although a greater proportion of OPs in the 40-59 years of age declared to contribute to the organization of such programs. Interestingly, following a more limited number of companies, prevalently of medium-high dimensions and more than 500 workers were positively associated with a greater percentage of OPs participating in HP plans, owing to the cultural and economic difficulties encountered by the micro and small enterprises to implement such types of activities as detailed above. This further underlines the relevance of the contribution of all the preventive actors in the workplace, even if small, in creating suitable settings for HP, as also suggested by the figures indicated as supporters of HP plans by the interviewed OPs.

Generally, the promotion of healthy lifestyles was the target of HP interventions. Evidence exists that health risk behaviors, including smoking and alcohol use, have been reduced through HP activities at work [18-20] while physical activity and healthy eating have improved [18, 21-23]. In addition, HP positively influenced business outcomes, including reduced staff turnover and absenteeism [24]. Other potential intervention targets, such as the psychological well-being of the workforce, a comfortable occupational environment, and a better home-work interface, were less frequently addressed. These issues should be the focus of future research aimed at collecting a series of multi-targeted activities that may be specifically adapted to different occupational realities according to the peculiar conditions of work, occupational risk factors experienced, and features of the employees. Different workplace circumstances must be given consideration when designing initiatives and interventions.

In this perspective, although our OP sample reported generally good participation of workers in HP plans, such enlarged proposals might offer HP interventions to the overall company workforce, thus assuring social inclusion and equal access to the decision to participate in such activities. In order to further enlarge employees' HP participation, it could be helpful to utilize social media and other intelligent communication strategies to promote healthy behaviors and offer incentives for workers who attend health education events or engage in healthy behaviors. Workplaces could host health fairs or other community events promoting healthy behaviors and lifestyles to reach the community and the workforce.

Several factors influencing the implementation of HP programs have been identified. First, multiple contextual levels can determine OP participation in HP plans, from political to intra-personal, via inter-personal, institutional, and community/social factors. In exploring these levels, our survey pointed out that interdisciplinary collaboration, adequate training on HP procedures, and appropriate information on the targeted population is essential for OPs to engage in HP effectively. In this view, it might be essential to consider the inclusion of information and training on HP early in the productive career of the OPs to adequately develop an HP culture that they will be able to spread/share in the occupational settings where they will operate, training existing occupational medicine staff to become health ambassadors who can provide basic health information to their peers.

A suitable assessment of the quality and effectiveness of HP programs may provide incentives to implement such strategies further. A strategic HP initiative should be intended as a systematic process of needs analysis, priority setting, planning, implementation, and evaluation [25]. To this latter aim, it appears necessary to define health, psychological, social, administrative, and economic indicators of the effectiveness of the HP activities that may allow pointing out possible critical aspects and follow up obtained benefits. Additionally, funding sources can support the implementation of HP, but the OP perspective for gainful employment should also be considered for HP motivation. Moreover, while financial resources are often considered in HP program design and implementation, the OP time resource implications of scoping, planning, implementing, and participating are frequently ignored. They should be considered more explicitly and thoughtfully in the OP engagement in such strategies. Future research could be directed toward testing and quantifying these themes to advance understanding of the pathway to successful workplace health and wellbeing initiatives, programs, and policies. This would help improve the capacity of workplaces wanting to effectively implement healthy changes and generate information that more clearly explicates the drivers of this type of change. Overall, this seems in line with the strategic role of the OPs as recipients of the TWH approach and key figures in HP, as pointed out by the NPP 2020-2025. In this regard, formative initiatives should be specifically targeted to the OPs, as is in the purpose of the SIML, which is to organize a special session on HP for the next 85° National Congress. This may be helpful to inform OPs better, providing them with updated knowledge to become more confident on HP procedures and models to be applied in different occupational settings.

Even if preliminary, the obtained results sound relevant as they regard a significant portion of the

Italian OPs. Although the participants were enrolled among the members of a scientific society, and this may introduce a bias in the sample recruitment, the large number of respondents among those SIML members engaged in OP activities allowed us to point out some issues that may be considered representative of the global scenario of the Italian OPs. Moreover, the findings provide an initial figure of the approach, opinions, and needs of OPs concerning HP in the workplace. It may be interesting to implement such an initial cross-sectional analysis with future follow-up investigations to assess the influence of possible formative interventions, governmental proposals for HP, and longer occupational medicine experience on HP on the OP feedback.

5. Conclusions

The results of this study support the general interest of the Italian OPs for HP in workplaces. However, several issues still need to be addressed to assess the appropriateness of ongoing health and wellbeing initiatives and understand how to encourage the OP successful participation best. In this view, a multifaceted approach involving education about what workplace health and wellbeing encapsulates is warranted. Further, information on the potential benefits of promoting workplace health and well-being aligned with OP perceptions and needs seems necessary to successfully implement HP interventions.

Supplementary Materials: The following are available in the online version: Table S1: Age-related differences in questionnaire responses; Table S2: Gender related differences in questionnaire responses; Table S3: Differences in HP perception according to the number of the workers employed in the enterprises where the OPs performed their professional activity; Table S4: Differences in HP perception according to the number of workers followed by OPs; Table S5. Analyses of the differences with respect to have been organizing HP interventions; Table S6: Analyses of the differences with respect to have been collaborating in HP interventions.

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Health Promotion Interventions in Occupational Settings: Fact-Finding Survey Among Italian Occupational Physicians

Supplementary Materials

Table S1. Age related differences in questionnaire responses.

Age related differences	Number of responses	< 39 years, N = 75	40-49 years, N = 62	50-59 years, N = 87	=> 60 years, N = 156	p-value
Gender	380					**<0.001**
Female		43 (57%)	27 (44%)	38 (44%)	25 (16%)	
Male		32 (43%)	35 (56%)	49 (56%)	131 (84%)	
OP activity	380					**<0.001**
No		34 (45%)	3 (4.8%)	3 (3.4%)	4 (2.6%)	
Yes		41 (55%)	59 (95%)	84 (97%)	152 (97%)	
Following the enactment of Legislative Decree 81/2008 and subsequent amendments, occupational HP programs have increased	335					N.C.
Do not agree at all		3 (7.3%)	6 (10%)	6 (7.1%)	10 (6.6%)	
Disagree		6 (15%)	12 (20%)	23 (27%)	48 (32%)	
Quite agree		25 (61%)	31 (53%)	38 (45%)	69 (46%)	
Very much agree		4 (9.8%)	8 (14%)	13 (15%)	14 (9.3%)	
Totally agree		3 (7.3%)	2 (3.4%)	4 (4.8%)	10 (6.6%)	
Occupational HP programs should be understood as an integral part of a system for protecting workers' health and psycho-physical integrity	336					N.C.
Do not agree at all		0 (0%)	0 (0%)	2 (2.4%)	0 (0%)	
Disagree		1 (2.4%)	2 (3.4%)	2 (2.4%)	3 (2.0%)	
Quite agree		4 (9.8%)	9 (15%)	12 (14%)	41 (27%)	
Very much agree		16 (39%)	27 (46%)	36 (43%)	58 (38%)	
Totally agree		20 (49%)	21 (36%)	32 (38%)	50 (33%)	
Occupational HP programs should be supported by collaboration with other health professionals (general practitioners, specialists in other disciplines)	336					N.C.
Do not agree at all		0 (0%)	1 (1.7%)	1 (1.2%)	1 (0.7%)	
Disagree		0 (0%)	3 (5.1%)	2 (2.4%)	2 (1.3%)	
Quite agree		11 (27%)	8 (14%)	20 (24%)	53 (35%)	
Very much agree		14 (34%)	25 (42%)	38 (45%)	59 (39%)	
Totally agree		16 (39%)	22 (37%)	23 (27%)	37 (24%)	

Based on your work experience, generally, the interest of employers in implementing health promotion programs is:	335					N.C.
Insufficient		2 (4.9%)	2 (3.4%)	10 (12%)	13 (8.6%)	
Poor		12 (29%)	18 (31%)	25 (30%)	58 (38%)	
Sufficient		17 (41%)	19 (32%)	26 (31%)	46 (30%)	
Good		9 (22%)	16 (27%)	19 (23%)	32 (21%)	
High		1 (2.4%)	4 (6.8%)	4 (4.8%)	2 (1.3%)	
In the last 5 years, during your work as OP, have you had the opportunity to organize health promotion interventions?	335					**0.020**
No		20 (49%)	19 (32%)	28 (33%)	76 (50%)	
Yes		21 (51%)	40 (68%)	56 (67%)	75 (50%)	
In the last 5 years, while carrying out the activity of OP, have you had the opportunity to collaborate in health promotion interventions?	334					0.562
No		17 (41%)	26 (44%)	34 (40%)	74 (49%)	
Yes		24 (59%)	33 (56%)	50 (60%)	76 (51%)	
How do you evaluate the workers' participation in such voluntary interventions?	274					N.C.
Insufficient		0 (0%)	1 (2.0%)	2 (2.6%)	3 (2.6%)	
Poor		1 (3.1%)	6 (12%)	16 (21%)	17 (15%)	
Sufficient		14 (44%)	15 (30%)	23 (30%)	50 (43%)	
Good		13 (41%)	22 (44%)	28 (37%)	42 (36%)	
High		4 (12%)	6 (12%)	7 (9.2%)	4 (3.4%)	
How do you evaluate the effectiveness of the HP interventions adopted?	267					N.C.
Not very effective		4 (12%)	3 (6.2%)	16 (22%)	23 (20%)	
Quite effective		20 (62%)	35 (73%)	40 (56%)	80 (70%)	
Very effective		7 (22%)	9 (19%)	12 (17%)	11 (9.6%)	
Completely effective		1 (3.1%)	1 (2.1%)	4 (5.6%)	1 (0.9%)	
Have effectiveness indicators been adopted (e.g. Key Performance Indicators – KPI)?	271					**0.025**
No		19 (59%)	29 (59%)	52 (71%)	81 (69%)	
I don't know		9 (28%)	4 (8.2%)	9 (12%)	20 (17%)	
Yes		4 (12%)	16 (33%)	12 (16%)	16 (14%)	

HP, health promotion; N.C, not calculable; OP, occupational physician.

Table S2. Gender related differences in in questionnaire responses.

Gender related differences	N	Female, N = 133	Male, N = 247	p-value
Age	380			**<0.001**
< 39 years		43 (32%)	32 (13%)	
40-49 years		27 (20%)	35 (14%)	
50-59 years		38 (29%)	49 (20%)	
=> 60 years		25 (19%)	131 (53%)	
OP activity	380			**0.006**
No		24 (18%)	20 (8.1%)	
Yes		109 (82%)	227 (92%)	
In how many companies are you currently appointed as OP?	332			**0.003**
< 10 enterprises		62 (57%)	83 (37%)	
10-25 enterprises		14 (13%)	39 (17%)	
26-50 enterprises		7 (6.5%)	36 (16%)	
> 50 enterprises		25 (23%)	66 (29%)	
Following the enactment of Legislative Decree 81/2008 and subsequent amendments, occupational HP programs have increased	335			0.218
Do not agree at all		7 (6.4%)	18 (8.0%)	
Disagree		21 (19%)	68 (30%)	
Quite agree		59 (54%)	104 (46%)	
Very much agree		16 (15%)	23 (10%)	
Totally agree		6 (5.5%)	13 (5.8%)	
Occupational HP programs should be understood as an integral part of a system for protecting workers' health and psycho-physical integrity	336			0.887
Do not agree at all		0 (0%)	2 (0.9%)	
Disagree		2 (1.8%)	6 (2.6%)	
Quite agree		19 (17%)	47 (21%)	
Very much agree		46 (42%)	91 (40%)	
Totally agree		42 (39%)	81 (36%)	
Occupational HP programs should be supported by collaboration with other health professionals (general practitioners, specialists in other disciplines)	336			0.200
Do not agree at all		0 (0%)	3 (1.3%)	
Disagree		1 (0.9%)	6 (2.6%)	
Quite agree		23 (21%)	69 (30%)	

Very much agree		50 (46%)	86 (38%)	
Totally agree		35 (32%)	63 (28%)	
Based on your work experience, generally, the interest of employers in implementing health promotion programs is:	335			**0.026**
Insufficient		6 (5.6%)	21 (9.3%)	
Poor		27 (25%)	86 (38%)	
Sufficient		44 (41%)	64 (28%)	
Good		25 (23%)	51 (22%)	
High		6 (5.6%)	5 (2.2%)	
In the last 5 years, during your work as OP, have you had the opportunity to organize health promotion interventions?	335			0.159
No		53 (49%)	90 (40%)	
Yes		56 (51%)	136 (60%)	
In the last 5 years, while carrying out the activity of OP, have you had the opportunity to collaborate in health promotion interventions?	334			0.054
No		58 (53%)	93 (41%)	
Yes		51 (47%)	132 (59%)	
How do you evaluate the workers' participation in such voluntary interventions?	274			0.671
Insufficient		3 (3.5%)	3 (1.6%)	
Poor		10 (12%)	30 (16%)	
Sufficient		31 (36%)	71 (38%)	
Good		33 (39%)	72 (38%)	
High		8 (9.4%)	13 (6.9%)	
How do you evaluate the effectiveness of the HP interventions adopted?	267			0.634
Not very effective		12 (15%)	34 (18%)	
Quite effective		57 (71%)	118 (63%)	
Very effective		9 (11%)	30 (16%)	
Completely effective		2 (2.5%)	5 (2.7%)	
Have effectiveness indicators been adopted (e.g. Key Performance Indicators – KPI)?	271			0.439
No		52 (64%)	129 (68%)	
I don't know		16 (20%)	26 (14%)	
Yes		13 (16%)	35 (18%)	

HP, health promotion; OP, occupational physician.

Table S3. Differences in HP perception according to the number of the workers employed in the enterprises where the OPs performed their professional activity.

Degree of agreement with the following statements concerning HP:	N	Enterprises with >49 employees, N = 183	Enterprises with ≤ 49 employees , N = 146	p-value
Following the enactment of Legislative Decree 81/2008 and subsequent amendments. occupational HP programs have increased	328			0.087
Do not agree at all		13 (7.1%)	12 (8.2%)	
Disagree		38 (21%)	50 (34%)	
Quite agree		97 (53%)	63 (43%)	
Very much agree		22 (12%)	14 (9.6%)	
Totally agree		12 (6.6%)	7 (4.8%)	
Occupational HP programs should be understood as an integral part of a system for protecting workers' health and psycho-physical integrity	329			0.731
Do not agree at all		1 (0.5%)	1 (0.7%)	
Disagree		4 (2.2%)	4 (2.7%)	
Quite agree		33 (18%)	32 (22%)	
Very much agree		72 (39%)	61 (42%)	
Totally agree		73 (40%)	48 (33%)	
Occupational HP programs should be supported by collaboration with other health professionals (general practitioners. specialists in other disciplines)	329			0.436
Do not agree at all		2 (1.1%)	1 (0.7%)	
Disagree		3 (1.6%)	4 (2.7%)	
Quite agree		43 (23%)	46 (32%)	
Very much agree		80 (44%)	53 (36%)	
Totally agree		55 (30%)	42 (29%)	
Based on your work experience, generally, the interest of employers in implementing HP programs is:	328			0.090
Insufficient		11 (6.0%)	15 (10%)	
Poor		56 (31%)	56 (39%)	
Sufficient		61 (33%)	47 (32%)	
Good		49 (27%)	23 (16%)	
High		6 (3.3%)	4 (2.8%)	

HP, health promotion.

Table S4. Differences in HP perception according to the number of workers followed by OPs.

Degree of agreement with the following statements concerning HP:	N	≤ 500 workers, N = 78	> 500 workers, N = 249	p-value
Following the enactment of Legislative Decree 81/2008 and subsequent amendments. occupational HP programs have increased	326			0.609
Do not agree at all		3 (3.8%)	22 (8.9%)	
Disagree		21 (27%)	65 (26%)	
Quite agree		39 (50%)	120 (48%)	
Very much agree		11 (14%)	26 (10%)	
Totally agree		4 (5.1%)	15 (6.0%)	
Occupational HP programs should be understood as an integral part of a system for protecting workers' health and psycho-physical integrity	327			0.740
Do not agree at all		0 (0%)	2 (0.8%)	
Disagree		2 (2.6%)	6 (2.4%)	
Quite agree		19 (24%)	45 (18%)	
Very much agree		31 (40%)	102 (41%)	
Totally agree		26 (33%)	94 (38%)	
Occupational HP programs should be supported by collaboration with other health professionals (general practitioners. specialists in other disciplines)	327			0.155
Do not agree at all		0 (0%)	3 (1.2%)	
Disagree		0 (0%)	7 (2.8%)	
Quite agree		28 (36%)	61 (24%)	
Very much agree		26 (33%)	105 (42%)	
Totally agree		24 (31%)	73 (29%)	
Based on your work experience, generally, the interest of employers in implementing health promotion programs is:	326			0.252
Insufficient		4 (5.2%)	23 (9.2%)	
Poor		21 (27%)	87 (35%)	
Sufficient		28 (36%)	78 (31%)	
Good		23 (30%)	52 (21%)	
High		1 (1.3%)	9 (3.6%)	

HP, health promotion.

Table S5. Analyses of the differences with respect to have been organizing HP interventions.

	Number of responses	No, N = 143	Yes, N = 192	p-value
Gender	335			0.127
Female		53 (37%)	56 (29%)	
Male		90 (63%)	136 (71%)	
Age	335			**0.020**
< 39 years		20 (14%)	21 (11%)	
40-49 years		19 (13%)	40 (21%)	
50-59 years		28 (20%)	56 (29%)	
=> 60 years		76 (53%)	75 (39%)	
OP activity	335			
Yes		143 (100%)	192 (100%)	
In how many companies are you currently appointed as OP?	331			**0.043**
≤ 25 enterprises		75 (53%)	122 (64%)	
>25 enterprises		66 (47%)	68 (36%)	
Number of employees in the enterprises where the OPs performed their professional activity	328			**<0.001**
≤ 49 employees		57 (40%)	125 (67%)	
>49 employees		84 (60%)	62 (33%)	
Number of followed workers per OP	327			**<0.001**
≤500		47 (33%)	31 (17%)	
> 500		94 (67%)	155 (83%)	
Following the enactment of Legislative Decree 81/2008 and subsequent amendments, occupational HP programs have increased	334			0.164
Do not agree at all		14 (9.8%)	11 (5.8%)	
Disagree		45 (31%)	43 (23%)	
Quite agree		61 (43%)	102 (53%)	
Very much agree		15 (10%)	24 (13%)	
Totally agree		8 (5.6%)	11 (5.8%)	

Occupational HP programs should be understood as an integral part of a system for protecting workers' health and psycho-physical integrity	335			0.052
Do not agree at all		0 (0%)	2 (1.0%)	
Disagree		4 (2.8%)	4 (2.1%)	
Quite agree		38 (27%)	28 (15%)	
Very much agree		53 (37%)	84 (44%)	
Totally agree		48 (34%)	74 (39%)	
Occupational HP programs should be supported by collaboration with other health professionals (general practitioners, specialists in other disciplines)	335			0.054
Do not agree at all		0 (0%)	3 (1.6%)	
Disagree		3 (2.1%)	4 (2.1%)	
Quite agree		47 (33%)	45 (23%)	
Very much agree		47 (33%)	88 (46%)	
Totally agree		46 (32%)	52 (27%)	
Based on your work experience, generally, the interest of employers in implementing HP programs is:	334			**<0.001**
Insufficient		17 (12%)	10 (5.2%)	
Poor		53 (37%)	59 (31%)	
Sufficient		51 (36%)	57 (30%)	
Good		20 (14%)	56 (29%)	
High		1 (0.7%)	10 (5.2%)	
In the last 5 years, during your work as OP, have you had the opportunity to collaborate to HP interventions?	333			**<0.001**
No		114 (80%)	37 (19%)	
Yes		28 (20%)	154 (81%)	
How do you evaluate the workers'participation in such voluntary interventions?	273			**<0.001**
Insufficient		6 (7.4%)	0 (0%)	
Poor		19 (23%)	21 (11%)	
Sufficient		35 (43%)	66 (34%)	
Good		19 (23%)	86 (45%)	
High		2 (2.5%)	19 (9.9%)	

Table S5 (*Continued*)

	Number of responses	No, N = 143	Yes, N = 192	p-value
How do you evaluate the effectiveness of the HP interventions adopted?	266			**<0.001**
Not effective at all		23 (30%)	23 (12%)	
Not very effective		51 (66%)	123 (65%)	
Quite effective		3 (3.9%)	36 (19%)	
Very effective		0 (0%)	7 (3.7%)	
Have effectiveness indicators been adopted (e.g. Key Performance Indicators – KPI)?	270			**0.001**
No		53 (67%)	127 (66%)	
I don't know		20 (25%)	22 (12%)	
Yes		6 (7.6%)	42 (22%)	

HP, health promotion; OP, occupational physician.

Table S6. Analyses of the differences with respect to have been collaborating in HP interventions.

	N	No, N = 143	Sì, N = 192	p-value
Gender	334			0.041
Female		58 (38%)	51 (28%)	
Male		93 (62%)	132 (72%)	
Age	334			0.562
< 39 years		17 (11%)	24 (13%)	
40-49 years		26 (17%)	33 (18%)	
50-59 years		34 (23%)	50 (27%)	
=> 60 years		74 (49%)	76 (42%)	
OP activity	334			
Yes		151 (100%)	183 (100%)	
In how many companies are you currently appointed as OP?	330			0.078
≤ 25 enterprises		81 (55%)	117 (64%)	
>25 enterprises		67 (45%)	65 (36%)	
Number of employees in the enterprises where the OPs performed their professional activity	327			**<0.001**
≤ 49 employees		65 (44%)	118 (66%)	
>49 employees		83 (56%)	61 (34%)	
Number of followed workers per OP	326			**<0.001**
≤500		53 (36%)	25 (14%)	
> 500		94 (64%)	154 (86%)	
Following the enactment of Legislative Decree 81/2008 and subsequent amendments, occupational HP programs have increased	333			0.453
Do not agree at all		13 (8.6%)	12 (6.6%)	
Disagree		42 (28%)	46 (25%)	
Quite agree		76 (50%)	86 (47%)	
Very much agree		14 (9.3%)	25 (14%)	
Totally agree		6 (4.0%)	13 (7.1%)	
Occupational HP programs should be understood as an integral part of a system for protecting workers' health and psycho-physical integrity	334			0.114
Do not agree at all		1 (0.7%)	1 (0.5%)	
Disagree		4 (2.6%)	4 (2.2%)	
Quite agree		38 (25%)	27 (15%)	
Very much agree		60 (40%)	76 (42%)	
Totally agree		48 (32%)	75 (41%)	

Table S6 (*Continued*)

	N	No, N = 143	Sì, N = 192	p-value
Occupational HP programs should be supported by collaboration with other health professionals (general practitioners, specialists in other disciplines)	334			0.190
Do not agree at all		0 (0%)	3 (1.6%)	
Disagree		3 (2.0%)	4 (2.2%)	
Quite agree		47 (31%)	43 (23%)	
Very much agree		54 (36%)	82 (45%)	
Totally agree		47 (31%)	51 (28%)	
Based on your work experience, generally, the interest of employers in implementing HP programs is:	333			0.058
Insufficient		18 (12%)	9 (4.9%)	
Poor		49 (33%)	63 (34%)	
Sufficient		52 (35%)	55 (30%)	
Good		28 (19%)	48 (26%)	
High		3 (2.0%)	8 (4.4%)	
In the last 5 years, during your work as OP, have you had the opportunity to organize HP interventions?	333			**<0.001**
No		114 (75%)	28 (15%)	
Yes		37 (25%)	154 (85%)	
How do you evaluate the workers' participation in such voluntary interventions?	273			**<0.001**
Insufficient		5 (5.6%)	1 (0.5%)	
Poor		21 (23%)	19 (10%)	
Sufficient		36 (40%)	65 (36%)	
Good		24 (27%)	81 (44%)	
High		4 (4.4%)	17 (9.3%)	
How do you evaluate the effectiveness of the HP interventions adopted?	266			**0.002**
Not very effective		25 (28%)	21 (12%)	
Quite effective		55 (62%)	119 (67%)	
Very effective		7 (8.0%)	32 (18%)	
Completely effective		1 (1.1%)	6 (3.4%)	
Have effectiveness indicators been adopted (e.g. Key Performance Indicators – KPI)?	270			**0.011**
No		67 (75%)	113 (62%)	
I don't know		15 (17%)	27 (15%)	
Yes		7 (7.9%)	41 (23%)	

HP, health promotion; OP, occupational physician.