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Original Article

Improving the job-retention strategies in multiple sclerosis workers: the role of occupational physicians

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Abstract: Several studies evaluated whether a person with multiple sclerosis is employed or not and investigated the main symptoms that hinder the job performance. However, despite occupational physicians are fundamental in managing disabled subjects, there is a serious lack of data regarding their role in improving employability of these workers. In this regard, we assessed occupational physicians' professional activity and training/updating needs in order to identify and develop management tools, operative procedures and training programs helpful to support and implement adequate job-retention strategies. Four hundred three Italian occupational physicians compiled a self-administered questionnaire to evaluate individual demographics, health surveillance system, fitness for work and training needs. Our findings confirmed the suitability to adopt environmental adjustments at workplace (particularly referring to the ergonomics of workstation, the typology of occupational risk factors and the working time) to accommodate individual's needs in order to improve working ability among multiple sclerosis workers. Moreover, training events discussing operational guidelines and standardized instruments and/or methodologies to adequately manage the disable workers should be fostered. Therefore, in this regard, occupational physicians could play a key role but they need more high-quality training especially concerning the different tools that are currently available to assess the work issues in multiple sclerosis patients.

Key words: Disability, Job-retention strategies, Multiple sclerosis, Occupational health practice, Occupational physicians, Work difficulties

Introduction

Multiple sclerosis (MS), being an incurable chronic and progressive demyelinating disease, is one of the most common neurological disorders that causes disability in young adults.[1)] Approximately, 2.3 million individuals worldwide have MS[2, 3)], the prevalence of this disease is considerably variable and its global median estimated incidence is 2.5/100,000 inhabitants/yr with highest levels in Europe (WHO, 2008)[1, 4, 5)]. In Europe the average age of onset is one of the lowest in the world and it is equal to 26.9 yr while the median estimated male/female ratio is the lowest (0.6)[1)].

The majority of patients affected by MS are first diagnosed with the relapsing-remitting MS form (RRMS) that is characterized by unpredictable periods of new or wors-

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ening symptoms (relapses) followed by periods of partial or full return to the person's level of functioning before the relapse (remissions)[6]. Most of the individuals with RRMS develops into a steadier progression of disability without relapses that is known as secondary-progressive MS form[6]. Considering that the most common symptoms of the disease include problems with walking, depression and cognitive dysfunction, numbness, deficits in balance and coordination, dysarthria, bladder and bowel disturbance, visual impairment, reduced heat tolerance, pain and fatigue[7], it is absolutely evident that MS represents a considerable psychological, physical, financial and social burden for patients, their families and/or social network[8, 9]. For example, it was estimated that in Europe the total economic costs of MS amount to 14.6 million €/yr with the highest costs per subjects (26,974 €/yr) among the main brain disorders[8]. This significant economic burden is mainly related to the young age of MS onset (symptoms first appear between ages 20 and 50) and to its unemployment rates[8, 10].

In this regard, it is noteworthy to point out that the most important social consequence of MS is the reduced employability due to the compromised ability to perform occupational functions and tasks[10]. In fact, several studies have investigated the relationship between MS and employment status trying to highlight the elements or symptoms that most negatively impact on employability. In general, the unemployment rate of subjects with MS is quite variable (depending on different factors such as level of disease severity and duration, educational level, type of working activities) and the available data shown a wide range of figures from 24% to 80%[11–15],with a mean unemployment rate of about 60%[16, 17].

Half of persons with MS will lose their job 9–15 yr after disease onset and the median time between first symptoms and scaling down the working capability is about 7 yr (i.e. scaling down from full-time to part-time work)[11–17]. The main factors associated with unemployment and difficulties related to the fitness for work are cognitive disorders, depression, anxiety, pain, fatigue and type of employment[11–17]. With regard to the factors and/or disease manifestations that most frequently were associated with difficulties in performing working tasks (that consequently raise problems in issuing a fitness for work judgment without limitations or prescriptions) they included, progressive disease course, increasing age, physical disability, higher levels of pain and fatigue, depression, anxiety and cognitive impairments/disorders[10–14, 17–25].

Considering the large amount of data highlighting the presence of a strict correlation between MS symptomatic manifestations and impaired work performance, it would expect to have as much information on the working environment factors that may hinder the work ability of subjects affected by this disease. Unfortunately, systematic assessments of occupational risk and work organization factors that might adversely influence the working capacity of MS patients are still lacking. Similarly, the key role played by occupational physicians (OPs) in preserving the employment of these individuals through the evaluation of fitness for work and the consequent application of specific prevention and protection measures is largely underestimated or underreported. Therefore, in this context, using a self-administered questionnaire, we conducted a survey of Italian OPs to gather data regarding their professional activity, information demands and training/updating needs related to the management of workers with MS. These data may be particularly helpful in defining, developing and implementing management strategies, operative procedures and training programs (for OPs, employers and employees) useful to support and improve the employability of workers affected by MS.

Subjects and Methods

Participants

According to the Decree Law no. 81/08, Italian graduates in medicine who are interested in practicing the profession of OP must undergo a 5 yr postgraduate training course in occupational medicine (OM). Alternatively, the OP profession can also be performed by specialists in forensic medicine or hygiene and preventive medicine who attended a 2nd-level university master course or by lecturers (with a proven period of teaching) in OM, industrial toxicology or hygiene and similar teaching courses. Finally, the role of OP can also be performed by those physicians in possession of the authorization pursuant to article 55 of Decree Law no. 277 of 15 August 1991 (these are physicians who, at the time of entry into force of this law, had already carried out the OP profession). As regard the OP's professional activity, most Italian OPs are freelance practitioners who work with employers and/or companies or with private occupational health centers. On the other hand, they can be employed in the Local Public Health Authority (Department for Prevention and Occupational Health and Safety) of the National Health System or work within public institutions and universities. All Italian OPs must be enrolled in the national register of OPs of the Italian Ministry of Health.

Sample selection

A total of 403 OPs living and working in Italy participated in this study between 2012 and 2013. A convenience sampling approach, including telephoning and contacting by e-mail the OPs (n=1,322) who had participated or collaborated on previous surveys conducted by the Italian Workers' Compensation Authority (INAIL) was used to identify participants. The inclusion criteria for the study were possessing the legal requirements to perform the professional activity of an OP in Italy and being listed in the OP national register of the Italian Ministry of Health at the time when the study was conducted. An electronic form or a mailed version of the questionnaire, a form for informed consent, a cover letter, which explained the purposes of the study and a preaddressed postage-paid return envelope to the INAIL, Research Division, Occupational Medicine Department were sent to the OPs. All non-respondents were sent a reminder letter approximately one month after the first invitation in order to encourage them to complete and return the questionnaire. The compiled questionnaires returned to INAIL were coded and the data were entered into an electronic file. This study was supported by the Italian Ministry of Health (as part of the research project named "The protection of the disable worker: integration and reintegration of workers with multiple sclerosis") and both the protocol study and the questionnaire were approved by the Institutional Review Board of the Italian Ministry of Health (PMS46/2007/P4).

Questionnaire (Appendix 1)

The main indicators of the survey were defined after conducting a careful review of the literature that investigated work issue in MS patients[9, 10, 17]. Consequently, according to the aims of the present study, we developed a structured questionnaire in order to obtain valuable information regarding the OP individual demographics and professional characteristics, the health surveillance system and the evaluation of fitness for work in MS workers and, finally, the OP training and updating needs on MS. A preliminary version of the questionnaire was pilot-tested with a small sample (n=40) of OPs for length, content, clarity and comprehensibility of each item, face validity and acceptance by the interviewees. Subsequently, the questionnaire was adapted and optimized according to OPs' suggestions and observations. The responses included no personal identifiers such as name or date of birth and all information was kept confidential.

Statistical data analysis

Statistical analysis was performed using SPSS software version 16. For categorical and Likert scale variables, percentages and frequencies were calculated on the total sample and, at a greater level of detail, contingency tables were employed to display the frequency distribution of the variables in the subsets generated by socio-demographic variables, in order to highlight any peculiarities. To test the association between socio-demographic variables and answers provided, the χ^2 Test was employed. Values of $p<0.05$ were considered significant.

Results

Demographic and professional practice information

The overall response rate was 30.4%, moreover it should be noted that, for all the items of each section of the questionnaire, missing data were always under 5% which is deemed a physiological value. Individual demographic and professional characteristics of OPs recruited in the survey are reported in Table 1. 65.9% of respondents were male and 34.1% female. Most of the OPs were aged 55–64 yr (37.0%) and lived in northern Italy (42.0%). As regards the legal requirements to carry out professional activity as an OP in Italy, 84.1% of the participants had specialized in OM, 4.0% in hygiene and preventive medicine and 0.5% in forensics medicine, whereas 11.4% were in possession of the authorization pursuant to article 55 of Decree Law no. 277. The overwhelming majority of surveyed OPs (77.7%) was self-employed and carried out health surveillance on a total number of workers between 1,001 and 1,500 (18.4%) or >1,500 (31.1%). The aforementioned results are in good agreement with the data obtained by our research group in other national surveys involving the OPs, thus confirming the good representativeness of the studied sample[26].

Management of workers with MS

In Table 2 we reported the main findings related to the management of MS workers by Italian OPs. In this regard, it is worth noting that most of the participants (67.8%) had to deal with at least one of these workers in the 24 months (77.6%) or 5 yr (69.7%) prior to the survey. The majority of MS workers (86.6%), being exposed to several occupational risk factors (mainly visual display units−30.8% and manual handling of loads−19.0%), was underwent to health surveillance medical examinations performed by the OPs in order to evaluate fitness for work (in this regard the health surveillance program established by OPs to collect,

Table 1. Demographic and professional characteristics of OPs recruited in the survey

Gender	N.	%
Male	265	65.9
Female	137	34.1
Age	N.	%
<35 yr	19	4.8
35–44 yr	92	23.2
45–54 yr	113	28.5
55–64 yr	147	37.0
≥65 yr	26	6.5
Geographical area of residence	N.	%
Northern Italy	169	42.0
Middle Italy	89	22.1
Southern Italy	105	26.1
Islands	40	9.9
Legal requirements to perform OP profession	N.	%
Specialty in OM	339	84.1
Authorization pursuant to article 55 of Decree Law no. 277	46	11.4
Specialty in hygiene and preventive medicine	16	4.0
Specialty in forensics medicine	2	0.5
OP profession as	N.	%
Self-employed	310	77.7
Employee (of a public/private occupational health center or of a company)	49	12.3
Self-employed and employee (of a public/private occupational health center or of a company)	40	10.0
Total number of workers seen as OP	N.	%
≤200	27	7.0
201–500	64	16.6
501–800	53	13.7
801–1,000	51	13.2
1,001–1,500	71	18.4
>1,500	120	31.1

analyze and evaluate health data on groups of workers can be quite different depending on the different risk factors to which workers are exposed and can therefore include different clinical investigations and test such as physical examinations, blood testing, spirometry and audiometry). In this connection, it is important to underline that the answers provided by the respondents indicated the presence of a certain difficulty in issuing a fitness for work judgment without limitations or prescriptions (59.6%) towards workers affected by this disease. Mainly, these difficulties are due to the ergonomic nature of the workstation (24.5%) or to physical characteristics of the workplace (17.4%), to the typology (22.5%) and magnitude (8.0%) of occupational risk factors to which MS workers are exposed and to the duration of working time (17.4%). Usually, when an OP releases a fitness for work judgment with limitations or prescriptions the employer is obliged to provide the worker with special accommodations (or alternatively to change the working tasks/activities of the worker) to ensure a complete and satisfactory fit between health conditions of workers and the characteristics of working tasks/activities.

Information demands and training/updating needs

The data collected from the questionnaire on OP's information demands, training and updating needs in relation to the issue of "disability and work", with particular reference to MS, have highlighted a significant demand for a greater number of high quality information on this topic (Table 3). In detail, although most of OP interviewed (54.1%) have already participated in disability and work training courses (referring to several pathologies such as cardiovascular, respiratory and metabolic diseases), they believe that a further detailed and specific training on this argument is necessary (43.2%). Moreover, it is evident that OPs need to be trained mainly on the most practical as-

Table 2. Management of workers with MS

Have you ever managed workers with MS carrying out your professional activity of OP?	N (%)					
Yes	271 (67.8)					
	<3		3–7		>7	
How many in the last 24 months	187 (77.6)		50 (20.7)		4 (1.7)	
How many in the last 5 yr	168 (69.7)		65 (27.0)		8 (3.3)	
No	129 (32.3)					
MS workers you managed were cared for the disease by…	N (%)					
Public specialist center	263 (78.3)					
General practitioner	65 (19.3)					
Other	8 (2.4)					
MS workers you managed were included in a health surveillance program?	N (%)					
Yes	226 (86.6)					
	1	2	3	4	5	>5
How many?	75 (28.7)	63 (24.1)	35 (13.4)	25 (9.6)	10 (3.8)	18 (6.9)
No	35 (13.4)					
MS workers included in the health surveillance program have asked you to be further visited (at least once) for work-related health problems caused by the disease?	N (%)					
Yes	93 (35.8)					
	1	2	3	4	5	>5
How many?	49 (18.8)	24 (9.2)	14 (5.4)	3 (1.2)	2 (0.8)	1 (0.4)
No	167 (64.2)					
The MS workers included in the health surveillance program reported to benefit of the Italian administrative status of disabled worker?	N (%)					
Yes	188 (66.7)					
No	94 (33.3)					
How many disabled workers with MS had been hired as a protected category?	N (%)					
0	153 (61.4)					
1	58 (23.3)					
2	20 (8.0)					
3	10 (4.0)					
4	2 (0.8)					
5	1 (0.4)					
>5	5 (2.0)					
Have you had any difficulty in issuing a fitness for work judgment without limitations or prescriptions when you visited MS workers?	N (%)					
Yes	152 (59.6)					
	1	2	3	4	5	>5
For how many workers have you had difficulty?	83 (32.5)	41 (16.1)	14 (5.5)	6 (2.4)	2 (0.8)	6 (2.4)
No	103 (40.4)					
The difficulties you experienced in issuing a fitness for work judgment without limitations or prescriptions were mainly related to…	N (%)					
Ergonomics of workstation	86 (24.5)					
Typology of occupational risk factors	79 (22.5)					
Working time	61 (17.4)					
Characteristics of workplace (i.e. presence of stairs)	61 (17.4)					
Equipment and working machinery	35 (10.0)					
Magnitude of occupational risk factors	28 (8.0)					
Other	1 (0.3)					

Continue of Table 2.

Did you need to carry out diagnostic insights (related to MS) to issue the fitness for work judgment?	N (%)
Yes	63 (24.1)
No	198 (75.9)
MS workers included in the health surveillance program to what occupational risk factors were exposed?	**N (%)**
VDUs	159 (30.8)
MHLs	98 (19.0)
Biological agents	77 (14.9)
Night work	52 (10.1)
Chemical substances	51 (9.9)
Noise	36 (7.0)
Vibrations	18 (3.5)
Biomechanical overload and/or non-ergonomic postures	13 (2.5)
NIR	4 (0.8)
Carcinogenic substances	3 (0.6)
Other	6 (1.2)

pects of their professional activity related to management of workers with disabilities (i.e., practical aspects of health surveillance and criteria for the formulation and issue of the fitness for work judgment). In this context, highly specialized training/updating courses, focused on the topic of disability and work, are considered the most useful tool to meet the information demands of OPs (41.8%). With regard to MS, a very small proportion of the participants (4.5%) attended to training and/or updating courses that specifically addressed this disease. Nevertheless, they strongly retain that an "*ad hoc*" formation dedicated to MS is necessary (38.9%) or at least useful (47.9%).

Comparison between different groups of OPs

In Italy, as briefly mentioned above, Decree Law no. 81/08 stated that the role of the OP can be carried out by physicians specializing in OM, forensic medicine, hygiene and preventive medicine and by those who are in possession of the authorization pursuant to article 55 of Decree Law no. 277. Although these physicians may perform the same professional activity (that is as OPs), it should be noted that their specialist training is quite different. Moreover, it should be noted that it is not obvious that all OPs have the same needs. Indeed, information demands, training and updating needs are influenced by several variables that belong to daily professional practice (i.e. geographical area where they perform the professional activity) or to other socio-demographic characteristics such as age and gender.

Consequently, we subdivided the respondents into different groups, according to several variables (gender, age, geographical area, legal requirements to perform OP profession), in order to investigate whether the different educational background and/or some OP socio-demographic characteristics could determine significant differences in these groups, especially in terms of information demands and training or updating needs. This kind of information could be very helpful in providing useful information to make the work environment for MS workers more comfortable and friendly. In Tables 4–8 we reported the statistically significant findings correlating the aforementioned variables and the information demands and training or updating needs of OPs.

Overall, the results showed that female OPs reported having greater training/updating needs especially regarding some particular aspects such as the forensics medicine and legislative framework, the emergency management of disable workers or the counselling to employers (Table 4). With regard to the geographical area where OPs perform their professional activity some statistically significant differences have been highlighted concerning the participation in training courses on disability and work and information demands (Table 5) demonstrating that both the sensitivity of OPs towards these topics and their training needs is closely related to the availability of training courses which in turn is heavily dependent on the training structures that insist in different geographical areas. It is noteworthy to point out that younger OPs feel they have a greater need of training, especially with regard to the practical aspects of health surveillance (Table 6), and this particular aspect of OP professional activity is a critical issue in managing MS

Table 3. Information demands and training/updating needs of OPs related to disability and MS

Have you ever participated in training courses on disability and work?	N. cases (%)			
Yes	212 (54.1)			
No	180 (45.9)			
Which pathologies have been addressed in these training courses?	N. responses (%)			
Cardiovascular diseases (i.e., heart attack, stroke…)	160 (36.4)			
Respiratory diseases (i.e., chronic obstructive pulmonary disease, emphysema…)	102 (23.2)			
Metabolic diseases (i.e., diabetes…)	59 (13.4)			
Neoplastic diseases	48 (10.9)			
Multiple sclerosis	20 (4.5)			
Amyotrophic lateral sclerosis	15 (3.4)			
Other	36 (8.2)			
According to your opinion, a specialist training in disability and work for the OPs is…	N. cases (%)			
Absolutely necessary	137 (34.4)			
Necessary	172 (43.2)			
Useful	89 (22.4)			
Indifferent	0 (0.0)			
According to your opinion, a specialist training in MS for the OPs is…	N. cases (%)			
Absolutely necessary	51 (12.7)			
Necessary	156 (38.9)			
Useful	192 (47.9)			
Indifferent	2 (0.5)			
Please indicate the degree of your training/updating needs for each of the following aspects related to disability and work	N. cases (%)			
	High	Medium	Low	Not necessary
Clinic and diagnostic	69 (29.0)	120 (49.8)	43 (18.3)	7 (2.9)
Forensics medicine and legislative framework	144 (58.2)	84 (33.7)	15 (6.0)	5 (2.0)
Practical aspects of health surveillance	152 (61.0)	79 (31.5)	14 (5.6)	5 (2.0)
Criteria for the formulation and issue of the fitness for work judgment	188 (73.4)	59 (22.8)	6 (2.3)	4 (1.5)
Emergency management	58 (24.0)	120 (50.0)	54 (22.3)	9 (3.7)
Counselling to employers	70 (28.7)	131 (54.1)	39 (16.0)	3 (1.2)
Counselling to employees	79 (32.5)	127 (52.7)	29 (11.9)	7 (2.9)
According to your information demands and training/updating needs in disability and work, which of the following tools is most useful?	N. responses (%)			
Training and updating courses	320 (41.8)			
Newsletter and electronic informative materials	192 (25.1)			
Workshops and congress	132 (17.3)			
Factsheets and/or paper informative materials	121 (15.8)			
According to your opinion, can a MS worker continue to work?	N. cases (%)			
Yes	397 (999.3)			
For many years?	10 yr	20 yr	Depends on the MS symptoms and their evolution over time	
	16 (4.1)	3 (0.8)	376 (95.2)	
No	3 (0.7)			

workers also for OPs not specialized in occupational medicine (Table 7). Finally, it is interesting to note that there is a direct proportionality between the difficulty in issuing a fitness for work judgment without limitations or prescriptions (towards MS workers) and the training interest of OPs in topics such as the practical aspects of health surveillance and the criteria for the formulation and issue of the fitness for work judgment (Table 8).

Discussion

A modern OP is a leading expert on mitigating the

Table 4. Statistically significant findings according to gender of OP

According to your opinion, a specialist training in disability and work for the OPs is…	Male		Female		*p* value
	N.	%	N.	%	
Absolutely necessary	83	31.6	53	39.6	0.017
Necessary	110	41.8	62	46.3	
Useful	70	26.6	19	14.2	
Please indicate the degree of your training/updating needs for each of the following aspects related to disability and work					
Forensics medicine and legislative framework	N.	%	N.	%	*p* value
High	112	45.2	66	51.2	0.030
Medium	86	34.7	51	39.5	
Low	33	13.3	5	3.9	
Not necessary	17	6.9	7	5.4	
Emergency management	N.	%	N.	%	*p* value
High	39	16.0	31	24.6	0.019
Medium	100	41.0	60	47.6	
Low	74	30.3	24	19.0	
Not necessary	31	12.7	11	8.7	
Counselling to employers	N.	%	N.	%	*p* value
High	59	23.6	40	31.5	0.043
Medium	113	45.2	61	48.0	
Low	39	15.6	14	11.0	
Not necessary	36	14.4	8	6.3	

impact of health conditions on work and his professional activity includes the evaluation of employee's absences, the analysis of work capacity, the management of disability at work[25, 26]. In this process OPs should not only take into account possible workplace-related threats to workers' health but they should also take into account any diseases, health issues or disabilities that might be an obstacle to the proper and secure performance of working tasks. Therefore, OP's management of disable workers is a rather challenging issue which necessarily requires in-depth evaluations and often the adoption of special and "reasonable accommodations" in order to improve their employability and ensure safe and healthy working conditions[27]: this is the case of MS workers.

MS is one of the most common neurological disorders that causes disability in young adults and the management of symptomatic manifestations and health status of MS patients implies the highest costs per subjects among the main brain disorders. Furthermore, usually symptoms first appear at ages up to 20 and/or 30 (that is at a critical point in working lives of patients) and consequently this disease is associated with a high unemployment rate in early adulthood. For these reasons, we deemed important to evaluate the relationships between health conditions of MS workers and workplaces from the OP point of view since this professional figure and its medical activity in the workplaces could play a strategical role in facilitating the creation of a friendly work environment for MS workers through the application of specific prevention and protection measures. Indeed, several studies, investigating the impact of MS on employment rate, observed that frequently, for workers affected by this disease, there is the need to adapt their work conditions to their health status[15, 16, 28, 29].

Our results are consistent with the available literature data showing that most of Italian OPs recruited in this survey experienced some difficulties in issuing a fitness for work judgment without limitations or prescriptions and then suggesting their need to identify specific environmental adjustments at the workplace to accommodate individual's needs in order to improve working ability among MS workers.

In this regard, it is interesting to note that interviewed OPs reported that major problems and critical issues were related to the ergonomics of workstation, the typology of occupational risk factors and the working time. These data would seem to confirm the findings already published by other studies, highlighting the fact that, in order to preserve the employability of these workers, there is the requirement of adjusting to individual disease symptoms and clinical manifestations the working conditions, with

Table 5. Statistically significant findings according to geographical area of OP professional activity

Have you ever participated in training courses on disability and work?	Northern Italy		Middle Italy		Southern Italy		Islands		*p* value
	N.	%	N.	%	N.	%	N.	%	
Yes	66	71.7	42	56.0	41	47.1	50	50.5	<0.001
No	26	28.3	33	44.0	46	52.9	49	49.5	
According to your opinion, a specialist training in disability and work for the OPs is…									
Absolutely necessary	35	37.6	15	19.7	32	36.4	46	44.7	0.012
Necessary	38	40.9	40	52.6	31	35.2	41	39.8	
Useful	20	21.5	21	27.6	25	28.4	16	15.5	
Indifferent	0	0.0	0	0.0	0	0.0	0	0.0	
Please indicate the degree of your training/updating needs for each of the following aspects related to disability and work Forensics medicine and legislative framework									
High	49	57.6	18	25.4	40	47.6	54	54.0	<0.001
Medium	30	35.3	28	39.4	34	40.5	33	33.0	
Low	3	3.5	13	18.3	9	10.7	9	9.0	
Not necessary	3	3.5	12	16.9	1	1.2	4	4.0	
Emergency management									
High	11	12.9	7	10.1	22	26.8	19	19.4	<0.001
Medium	46	54.1	24	34.8	29	35.4	49	50.0	
Low	25	29.4	19	27.5	23	28.0	24	24.5	
Not necessary	3	3.5	19	27.5	8	9.8	6	6.1	
Counselling to employers									
High	18	20.2	14	19.7	25	30.1	31	31.3	<0.001
Medium	53	59.6	23	32.4	37	44.6	48	48.5	
Low	15	16.9	7	9.9	15	18.1	16	16.2	
Not necessary	3	3.4	24	33.8	5	6.0	3	3.0	
Counselling to employees									
High	21	23.6	14	20.0	24	28.9	40	40.0	<0.001
Medium	51	57.3	24	34.3	39	47.0	40	40.0	
Low	13	14.6	6	8.6	12	14.5	17	17.0	
Not necessary	3	3.4	26	37.1	7	8.4	2	2.0	

particular reference to the ergonomic and technical characteristics of the work post and the duration of working time[10, 15, 28]. Another important work-related factor that could significantly complicate the working activity of MS workers is the need to carry out tasks requiring heavy physical efforts. Actually, with regard to this topic, literature data are quite conflicting since in some studies the degree of physical effort required by the job would seem to be unrelated to employment status[11, 18, 30], while, in others studies, the jobs requiring physical strength would increase the odds of unemployment[10, 31]. The results of our study are not particularly useful in resolving this issue although the consideration that manual handling of load was the second risk factor to which MS workers were exposed (19.0%) and the fact that OPs found difficulties in assessing their work ability (taking into account the occupational risk factors) should suggest, at least, caution and special attention to ensure a complete and satisfactory fit between MS workers (especially those experiencing fatigue) and job.

Interestingly, only the 66.7% of the MS workers included in the health surveillance programs reported to benefit of the Italian administrative status of disabled worker and only 38.6% of this percentage has been hired as disabled worker belonging to a protected category (civilian disabled with a reduction in work capacity exceeding 45%). Although these figures are very similar to those reported by other studies[28] this is a quite surprising finding since the recruitment of a disabled worker as a protected category is an advantage both for the employer (who could benefit from several bonuses on social security tax fees, funding schemes and financial bonuses) and the

Table 6. Statistically significant findings according to OP age

Please indicate the degree of your training/updating needs for each of the following aspects related to disability and work	<35		35–44		45–54		55–64		65 e oltre		*p* value
Forensics medicine and legislative framework	N.	%	N.	%	N.	%	N.	%	N.	%	
High	13	68.4	52	58.4	42	38.9	62	45.3	7	36.8	
Medium	5	26.3	27	30.3	46	42.6	53	38.7	5	26.3	0.027
Low	0	0.0	7	7.9	15	13.9	12	8.8	3	15.8	
Not necessary	1	5.3	3	3.4	5	4.6	10	7.3	4	21.1	
Practical aspects of health surveillance											
High	19	100.0	62	68.9	69	62.7	77	55.4	14	66.7	
Medium	0	0.0	24	26.7	29	26.4	56	40.3	6	28.6	0.002
Low	0	0.0	4	4.4	11	10.0	3	2.2	0	0.0	
Not necessary	0	0.0	0	0.0	1	0.9	3	2.2	1	4.8	

Table 7. Statistically significant findings according to legal requirements to perform OP profession

Please indicate the degree of your training/ updating needs for each of the following aspects related to disability and work	Specialty in OM		Specialty in forensics medicine		Specialty in hygiene and preventive medicine		Authorization pursuant to article 55 of Decree Law no. 277		*p* value
Practical aspects of health surveillance	N.	%	N.	%	N.	%	N.	%	
High	209	64.5	2	100.0	13	86.7	19	44.2	
Medium	91	28.1	0	0.0	1	6.7	24	55.8	0.012
Low	18	5.6	0	0.0	1	6.7	0	0.0	
Not necessary	6	1.9	0	0.0	0	0.0	0	0.0	
Counselling to employers									
High	94	29.5	0	0.0	2	14.3	4	9.3	
Medium	144	45.1	2	100.0	6	42.9	22	51.2	0.010
Low	35	11.0	0	0.0	4	28.6	14	32.6	
Not necessary	39	12.2	0	0.0	2	14.3	3	7.0	

employee (who could take advantage from the application and implementation of specific job-retention strategies specifically reserved for disabled workers). In principle, there are two main possible explanations for this result, the first being that the degree of disability recognized to MS workers was less than 45%, while the second possibility would lie in the reticence about disclosure of the person's disease status at the workplace (to the employer or to the OP)[32]. In this regard, not having investigated the degree of disability, we are unable to deepen the analysis of this information. Anyway, we consider it appropriate to suggest OPs to encourage MS workers to discuss their disease even at workplace by using the most appropriate stakeholders (i.e. OPs, Human Resource managers and/or employers) since, the available literature data demonstrated that the disclosure of the disease is positively correlated to preserving job[33], whereas on the contrary the lack of disclosure could complicate the workplace conditions and/or may create hostile or difficult relationships with colleagues[28, 34]. In this context, the OPs can play a central role in evaluating and identifying the most suitable accommodations to be taken by employers for MS workers, in suggesting vocational interventions to adequately manage the different and complicated aspects of the disease in the workplace and in supporting MS workers, co-workers and employers with specific and targeted counselling programs and strategies[10, 28, 32, 35].

With regard to the last issue, it is worth pointing out that the counselling to the employers and/or to employees is not the first concern of OPs in terms of information demands and training/updating needs. On the other hand, the OPs considered particularly important training and updating on topics like practical aspects of health surveillance and criteria for the formulation and issue of the fitness for work judgment. These results are in good agreement with those recently published by our research group which demonstrated that Italian OPs have a high educational need in relation to topics that should be more addressed

Table 8. Relationships between information demands and training/updating needs of OPs and the difficulties in issuing the fitness for work judgment

	For how many MS workers have you had any difficulty in issuing a fitness for work judgment without limitations or prescriptions?							
Please indicate the degree of your training/updating needs for each of the following aspects related to disability and work	Nessuno	1	2	3	4	5	>5	*p* value
Clinic and diagnostic				%				
High	20.2	33.8	27.0	28.6	20.0	0.0	33.3	0.582
Medium	66.0	42.5	51.4	50.0	60.0	100.0	50.0	
Low	13.8	18.8	18.9	21.4	20.0	0.0	16.7	
Not necessary	0.0	5.0	2.7	0.0	0.0	0.0	0.0	
Forensics medicine and legislative framework				%				
High	40.4	42.0	63.2	35.7	50.0	0.0	83.3	0.168
Medium	37.2	37.0	26.3	50.0	50.0	50.0	0.0	
Low	14.9	8.6	10.5	14.3	0.0	50.0	16.7	
Not necessary	7.4	12.3	0.0	0.0	0.0	0.0	0.0	
Practical aspects of health surveillance				%				
High	61.5	65.4	50.0	28.6	20.0	0.0	50.0	<0.001
Medium	33.3	24.7	42.1	64.3	80.0	50.0	50.0	
Low	4.2	8.6	5.3	7.1	0.0	0.0	0.0	
Not necessary	1.0	1.2	2.6	0.0	0.0	50.0	0.0	
Criteria for the formulation and issue of the fitness for work judgment				%				
High	79.8	77.1	62.5	85.7	33.3	50.0	83.3	<0.001
Medium	17.2	19.3	35.0	14.3	50.0	0.0	16.7	
Low	3.0	1.2	2.5	0.0	0.0	0.0	0.0	
Not necessary	0.0	2.4	0.0	0.0	16.7	50.0	0.0	
Emergency management				%				
High	16.0	11.5	13.5	21.4	0.0	50.0	50.0	0.200
Medium	40.4	47.4	54.1	28.6	20.0	0.0	33.3	
Low	34.0	30.8	24.3	50.0	60.0	0.0	16.7	
Not necessary	9.6	10.3	8.1	0.0	20.0	50.0	0.0	
Counselling to employers				%				
High	25.8	24.7	25.6	28.6	40.0	0.0	33.3	0.875
Medium	45.4	39.0	46.2	57.1	60.0	100.0	50.0	
Low	15.5	24.7	17.9	14.3	0.0	0.0	16.7	
Not necessary	9.3	11.7	10.3	0.0	0.0	0.0	0.0	
Don't know	4.1	0.0	0.0	0.0	0.0	0.0	0.0	
Counselling to employees				%				
High	25.5	28.8	32.5	42.9	20.0	0.0	33.3	0.446
Medium	46.8	38.8	40.0	50.0	80.0	100.0	66.7	
Low	10.6	21.3	25.0	7.1	0.0	0.0	0.0	
Not necessary	16.0	11.3	2.5	0.0	0.0	0.0	0.0	

towards the practical needs of their professional activity[36]. Therefore, also considering that training and updating courses are considered the most useful tools to improve the overall quality of OP activity, as a whole, our findings suggest the need to organize training events discussing topics and issues that identify and present operational guidelines and standardized instruments and/or methodologies to adequately evaluate and manage the disable workers. For example, particularly referring to the management of MS workers, it might be a good idea to increase the OP awareness towards the different tools that are available to them to assess the work issues in MS patients. In this regard, in literature there are several validated questionnaires such as the Multiple Sclerosis Work Difficulties Questionnaire (MSWDQ), the Multiple Sclerosis-specific Work Instability Scale (MS-WIS) and the Multiple Sclerosis Question-

naire for Job Difficulties (MSQ-Job)[10, 37, 38]. In detail the MSQ-Job is a questionnaire that assess difficulties in work-related activities as a function of both MS symptoms and working environment features[10]. Consequently, the adoption of the MSQ-Job questionnaire as integral part of the health surveillance protocol used by OPs could be an extremely useful tool to identify the most appropriate protective and preventive measures and/or specific accommodations to ensure safe and healthy working conditions and improve the work performance.

Finally, it is interesting to note that most of OPs considered necessary (or absolutely necessary) to receive a specialist training in the field of disability and work, whereas, in reference to the specific issue of MS the majority of respondents believed that a specialist training is only useful but not necessary. Moreover, although slightly more than half of interviewed OPs participated in training courses on disability and work, only the 4.5% of them took part in training courses on MS. Overall these figures would seem to indicate that OPs have little interest in the issue of MS. However, with the information in our possession we are not able to discriminate whether this hypothesis is valid or if the results are a consequence of poor training offer with regard to this topic. Anyhow, considering the findings of the present survey and taking into account the disease prevalence, its young age of onset and unemployment rates, it is our opinion that a higher quality training on the assessment and management of work difficulties of MS workers should be taken into consideration. In this regard, it is our opinion that a particular aspect of this improved and specialized training/updating offer should be dedicated to achieve a better cooperation between OPs and other healthcare professionals (i.e. neurologists, general practitioners, physiotherapists) since it is essential in order to achieve an overall improvement of workers/patients' well-being[39, 40]. Indeed, the management of MS workers health status in terms of negative impact on the work capacity and/or ability and of consequent application of limitations related to the performance of a specific task should be based on a careful multidisciplinary evaluation[39, 40].

The lack of data concerning the opinion and the viewpoint of MS workers represents the main limitation of the study. In fact, it prevents us to analyze and hypothesize in more detail, especially from a qualitative point of view, the main difficulties that hinder the realization of a full and satisfactory fit between health conditions of MS workers and the characteristics of working tasks/activities. Nevertheless, considering the paucity of data regarding this issue and the fact that this is the first attempt to investigate this topic we believe that our findings provided interesting information and may represent a good starting point to more thoroughly assess this complex and faceted issue. Another possible limitation of the study is related to the chosen tool (self-administered questionnaire) to carry out the survey which it is possibly associated with a lower involvement of respondents or difficulties in understanding and filling in the questionnaire. However, in this regard, we tried to overcome these problems providing to OPs, along with the questionnaire, a cover letter that explained in detail the aims of the research and gave, at the same time, as many as possible information and instructions on the proper understanding and filling of the questionnaire itself. Finally, it should be considered that the study population is defined by OP respondents that had participated or collaborated on previous surveys conducted by the INAIL and thus a selection bias is possible.

Conclusions

To the best of our knowledge, this is the first study that investigated the difficulties experienced by OPs facing workers affected by MS. Numerous studies have analyzed whether a person with MS is employed or not and mostly addressed the clinical manifestations of this pathology that hinder the carrying out of the job. However, there is a serious lack of data regarding the impact of working environment features and of the occupational risk factors on the work performance of these subjects as well as the role of OPs in managing and improving their employability is largely unexplored. Our findings suggested that the management of MS workers is a delicate and rather complicated issue that frequently required the adoption of specifically dedicated measures and accommodations. In this regard, OPs, carrying out health surveillance medical examinations and then evaluating fitness for work, could play a strategical role. However, they need more high-quality training that should be able to provide them with helpful data related to disability and work and specific tools to evaluate the working ability of MS (and, more in general, of disabled) workers in relation to occupational risk factors. Future studies should identify reliable and standardized strategies and the most useful and valuable instruments to face the most critical aspects of managing MS workers, check their applicability in daily OP activity, evaluate their transferability in any pathological condition that involves an important disability of the worker (i.e. other intractable, neurological, and autoimmune diseases such as rheumatoid arthritis or systemic lupus erythemato-

sus) and finally evaluate the outcome of such interventions in terms of preserving employment or improving employability of MS workers.

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Conflict of Interests

The authors have no conflict of interest to declare.

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Appendix 1. Questionnaire

Section A. Occupational Physicians individual demographics and professional characteristics

1. Gender
   a. Male
   b. Female
2. Age
   a. <35 yr
   b. 35–44 yr
   c. 45–54 yr
   d. 55–64 yr
   e. >65 yr
3. Where do you live and and practice the profession of Occupational Physicians (OP)?
   a. Northern Italy
   b. Middle Italy
   c. Southern Italy
   d. Islands
4. What is the the legal requirements that you have to perform OP profession?
   a. Specialty in Occupational Medicine
   b. Authorization pursuant to article 55 of Decree Law no. 277
   c. Specialty in hygiene and preventive medicine
   d. Specialty in forensics medicine
5. Do you practice the OP profession as:
   a. Self-employed
   b. Employee (of a public/private occupational health center or of a company)
   c. Self-employed and employee (of a public/private occupational health center or of a company)
6. Doing your OP profession how many workers you visit in a year?
   a. ≤200
   b. 201–500
   c. 501–800
   d. 801–1,000
   e. 1,001–1,500
   f. >1,500

Section B. Health surveillance system and evaluation of fitness for work in Multiple Sclerosis (MS) workers

1. Have you ever managed workers with MS carrying out your professional activity of OP?
   a. Yes
   b. No

1B If yes

   a. How many in the last 24 months?
   <3; 3–7; >7
   b. How many in the last 5 yr?

2. MS workers you managed were cared for the disease by:
   a. Public specialist center
   b. General practitioner
   c. Other
3. MS workers you managed were included in a health surveillance program?
   a. Yes
   b. No

3B If yes, how many?
   a. 1; 2; 3; 4; 5; >5

4. MS workers included in the health surveillance program have asked you to be further visited (at least once) for work-related health problems caused by the disease?
   a. Yes
   b. No

4B If yes, how many?
   a. 1; 2; 3; 4; 5; >5

5. The MS workers included in the health surveillance program reported to benefit of the Italian administrative status of disabled worker?
   a. Yes
   b. No
6. How many disabled workers with MS had been hired as a protected category?
   a. 0; 1; 2; 3; 4; 5; >5
7. Have you had any difficulty in issuing a fitness for work judgment without limitations or prescriptions when you visited MS workers?
   a. Yes
   b. No

7B If yes, for how many workers have you had difficulty?
   a. 1; 2; 3; 4; 5; >5

8. The difficulties you experienced in issuing a fitness for work judgment without limitations or prescriptions were mainly related to:
   a. Ergonomics of workstation
   b. Typology of occupational risk factors
   c. Working time
   d. Characteristics of workplace (i.e. presence of stairs)
   e. Equipment and working machinery
   f. Magnitude of occupational risk factors
   g. Other
9. Did you need to carry out diagnostic insights (related to MS) to issue the fitness for work judgment?
   a. Yes
   b. No

10. MS workers included in the health surveillance program to what occupational risk factors were exposed?
    a. VDUs
    b. MHLs
    c. Biological agents
    d. Night work
    e. Chemical substances
    f. Noise
    g. Vibrations
    h. Biomechanical overload and/or non-ergonomic postures
    i. NIR
    j. Carcinogenic substances
    k. Other

Section C. Occupational Physician training and updating needs on Multiple Sclerosis

1. Have you ever participated in training courses on disability and work?
    a. Yes
    b. No

2. Which pathologies have been addressed in these training courses?
    a. Cardiovascular diseases (i.e., heart attack, stroke…)
    b. Respiratory diseases (i.e., chronic obstructive pulmonary disease, emphysema…)
    c. Metabolic diseases (i.e., diabetes…)
    d. Neoplastic diseases
    e. Multiple sclerosis
    f. Amyotrophic lateral sclerosis
    g. Other

3. According to your opinion, a specialist training in disability and work for the OPs is:
    a. Absolutely necessary
    b. Necessary
    c. Useful
    d. Indifferent

4. According to your opinion, a specialist training in MS for the OPs is:
    a. Absolutely necessary
    b. Necessary
    c. Useful
    d. Indifferent

5. Please indicate the degree of your training/updating needs for each of the following aspects related to disability and work (high; medium; low; not necessary):
    a. Clinic and diagnostic
    b. Forensics medicine and legislative framework
    c. Practical aspects of health surveillance
    d. Criteria for the formulation and issue of the fitness for work judgment
    e. Emergency management
    f. Counselling to employers
    g. Counselling to employees

6. According to your information demands and training/updating needs in disability and work, which of the following tools is most useful?
   a. Training and updating courses
   b. Newsletter and electronic informative materials
   c. Workshops and congress
   d. Factsheets and/or paper informative materials
7. According to your opinion, can a MS worker continue to work?
   a. Yes
   b. No

7B If yes, for how many years?
   a. 10; 20; Depends on the MS symptoms and their evolution over time.