

The Occupational Health Nurse and his/here role in the prevention of work-related diseases: results of an observational study

G. La Torre¹, F. D'Andreano¹, G. Lecce², M. Di Muzio³, M. Chiarini¹, A.M.L. Pulimeno⁴

Key words: Occupational health nurse, prevention, cross-sectional study.

Parole chiave: Infermiere occupazionale, prevenzione, studio cross-sectional.

Abstract

Background. In Italy, health in the workplace is still considered a field for physicians only. In contrast to Europe, the figure of the occupational health nurse is not yet present, due to the absences of contractual and university fields. The present study aimed to carry out a survey for understanding the usefulness of the introduction of the occupational health nurse in the field of prevention and protection of health at work.

Materials and methods. The questionnaire was administered via an online survey to health professionals including Students (undergraduate and post-graduate levels) of Nursing Sciences and Midwives, Nurses, Physicians specialized in Hygiene and Preventive Medicine, in Occupational Medicine and Legal Medicine. The questionnaire included 26 questions. The statistical analysis, conducted with SPSS software (release 25.0), has been articulated through the use of frequency tables and contingency tables. Differences in participants' responses were analyzed with the chi-square and Fisher's exact tests, where applicable, considering gender, marital status, presence of sons in families, age, macro-region, and professional activities as potential explanatory variables.

Results. After two general reminders, 232 individuals entered the survey, with an overall response rate of 65%. 42.2% of the participants were nurses, aged between 20 and 64 years. Around 70% were females. A low percentage (9.9%) is associated with respondents from northern Italy 53.0% from Center and 37.1% from southern Italy. The questionnaire included four major fields of occupational health nursing. The nursing role for companies (items 8, 12, 13, 14, and 17): the responders approve the introduction of the occupational health nurse in the companies for his/her competences on health promotion and work-related diseases prevention. Utility for companies (items 18, 19, 20 and 21): the usefulness brought by the occupational health nurse to companies is fully shared by the responders. Occupational Health Nurse's action field (items 16, 22, 23 and 24): the answer "yes" has the highest prevalence among the responders, followed by "I don't know". Education (items 25 and 26): Nurses, Physicians and Nursing Students think that the occupational health nurse must have an appropriate university training program, in particular, a master's first degree. Concerning the main focus of the study (opinion on which was the most suitable course of study for the occupational health nurse), 85 (36,6 %) participants answered, "First level Master degree", and 60 (25,9 %) "Advanced training course".

Conclusions. This study wanted to highlight the opinion of professionals on the usefulness of this new nursing figure, projected into the world of occupational medicine. The OHN supports the Physician with his/her professionalism and autonomy in prevention and treatment of work-related diseases, as demonstrated and valued in the rest of Europe. The implementation of advanced courses on occupational nursing, and in particular specific post-graduate degrees, is needed.

¹ Department of Public Health and Infectious Diseases, Sapienza University of Rome, Rome, Italy

² Department of Emergency, Hospital Santo Spirito in Sassia, Rome, Italy

³ Department of Clinical and Molecular Medicine, Sapienza University of Rome, Rome, Italy

⁴ President of the Order of Nursing Professions, OPI, Rome, Italy

Introduction

Health, 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), is the object of every profession in the health field. Nurses guarantee the health of the human being and the community, through technical, managerial, relational, and educational interventions.

With regard to health in the workplace, nurses can adapt their tools not only to the working environment in which they work (i.e., industry or agriculture) but also to the normative and healthcare characteristics, typical of the specific working activity. In this context, WHO has developed and published an essential document in which the profile of the occupational health nurse (OHN) is defined (2). According to this document, OHN can play a major role in protecting and improving health of the working population in Europe and can give a significant contribution to the sustainable development, improved competitiveness, job security, and increased profitability in enterprises and communities.

In Italy, the role of OHN is not well recognized, due to a lack of definition of the specialized profile and, consequently, the absence of an university framework of specific post-graduate degrees.

In some European countries, the OHNs are already present and are supported by specific organizations and regulations that outline their field of action and their specific objectives.

These Countries (UK, Belgium, France, Denmark, Germany, Greece and Norway) founded in 1993 the Federation of Occupational Nursing in the European Union (FOHNEU), which contributes to improving the total health and well-being of the European working population; enriches the profile of the occupational nurse in the European Union through courses, conferences

and international meetings; promotes the updating, qualification and standards that characterize this figure; encourages research in the field of occupational health, education and management, with the publication of the related results; maintains an open and continuous dialogue with the European organizations responsible for health at work and public health and with European nursing authorities (3)

Overseas, in the USA, the OHN is supported by the American Association of Occupational Health Nurses (AAOHN), which allocates economic and educational links to enrich nurses' knowledge and to update their skills with appropriate training. AAOHN encourages its members to attend refresher courses, conferences, to carry on research and prevention work for health.

The AAOHN defines occupational nursing care as follows: *“Occupational and environmental nursing care is a specialized practice that provides health and safety programs and services to workers, working groups and community groups. The practice focuses on promoting and restoring health, preventing illness and injury, and protecting against risks related to work and the environment. Occupational Health Nurses have a combined knowledge of health and business that blends health skills to balance the requirement of a safe and healthy work environment with a “healthy” bottom line”* (4).

Since 2010, despite the profile of the occupational nurse was already well defined, the American nursing community felt the need to structure a scale of skills (5), both to structure a growth and a continuous training path, and to prepare a check-list with all the qualifications and skills that the occupational nurses must have according to their levels.

AAOHN has also included occupational nursing in the three-year “Nursing Now” (2018-2020) health implementation program, stating that there is the need to use nurses' knowledge and skills of nurses, especially in

the decision-making process, to ensure the quality of worker's health (6).

Before planning and implementing a specific university path for OHN in Italy, it is advisable to know what the Italian health scientific community, including Nurses, Physicians, and Students, think about this issue. Therefore, this study aimed to carry out a survey on this topic, and on the usefulness of introducing the OHN in the field of workplace prevention and safety.

Materials and methods

The questionnaire

The study was conducted through the administration of a questionnaire, composed of 26 multiple choice questions, each of which has a single correct answer, only. The questionnaire, after the validation by the president of the professional Register of Nurses in Rome, was drawn up and distributed through an online survey to easily reach all the categories of professionals involved in the study.

The following items were considered for the analysis:

Item 8: Could the promotion of active participation in health activities carried out by the nurse be important for the employees of a company?

Item 12: Can the figure of the Occupational Nurse be important within a company, public or private?

Item 13: Can Occupational Nurses contribute to the management of environmental health in those companies that do not employ environmental health specialists?

Item 14: Can the empathic relationship between a company's employees and an Occupational Nurse be important?

Item 16: Can Occupational Nurses play a key role in protecting and improving health in the working population?

Item 17: Can Occupational Nurses

contribute more to the development of the health figure within public or private companies?

Item 18: Can Occupational Nurses provide guidance on workplace safety systems and tools within the company?

Item 19: Can Occupational Nurses contribute to the success of a company?

Item 20: Can Occupational Nurses improve performance in business organizations?

Item 21: Do Occupational Nurses, who do business within companies, affect the reduction of employee health costs?

Item 22: Can the Occupational Nurses carry out activities to prevent injuries at work?

Item 23: Can Employment Nurses assist the Occupational health Physicians in the activities provided for by Legislative Decree 81/2008?

Item 24: Can Occupational Nurses provide first aid in case of accidents at work?

Item 25: Do you think the Occupational Nurses must have the appropriate training?

Item 26: If you answered "yes" to the previous question, what kind of course, would be appropriate for the training of the Occupational Nurse?

The setting

Participants were asked to fill in the questionnaire in the period May-October 2018, using a mailing list of:

- Students (undergraduate and post-graduate levels) of Nursing Sciences and Midwives;

- Nurses;

- Physicians specialized in Hygiene and Preventive Medicine;

- Physicians specialized in Occupational Medicine;

- Physicians specialized in Legal Medicine.

The e-mail gave the possibility to fill in the questionnaire using a specific web-link.

Statistical analysis

The variables used in the statistical analysis were the following:

- Gender (females and males);
- Age (<35 years and ≥ 35 years);
- Marital status (married and unmarried);
- Number of sons (presence or absence in the family unit);
- Macro-Region of origin (north, center, and south of Italy);
- Professional activity (mainly divided into Physicians, Nurses, and students of Nursing).

Differences between groups were evaluated using the chi-square test, and the Yates correction or Fisher exact test where applicable. The significance level was set at $p < 0.05$.

Data analysis was performed using the statistical software SPSS, version 25, reporting data in appropriate frequency table.

Results

After two general reminds, 232 individuals entered the survey, with an overall response rate of 65% (232 out of 357). The participants were 77 (33.2%) males and 155 (66.8%) females. 131 (56.5%) of respondents were unmarried and 138 (59.5%) had no sons; 23 (9.9%) respondents came from the North of Italy, 123 (53.0%) from the Center and 86 (37.1%) from the South. Finally 47 (20.3%) respondents are Physicians, 98 (42.2%) are nurses and 87 (37.5%) are nursing students (Table 1).

Interestingly, it is to note that the neutral answer "I do not know" was mainly chosen by the respondents (perhaps indicating a lack of knowledge about OHN) (Figure 1).

Concerning question 26, through which the respondents are asked to indicate which is the most suitable postgraduate path to the training of the OHN, almost half of participants indicated the master level

Table 1 – Characteristics of the sample (232 respondents)

Variable	N (%)
<i>Gender</i>	
Males	77 (33.2)
Females	155 (66.8)
<i>Age</i>	
< 35 years	140 (60.3)
≥ 35 years	92 (39.7)
<i>Marital Status</i>	
Married	101 (43.5)
Unmarried	131 (56.5)
<i>Sons</i>	
Yes	94 (40.5)
No	138 (59.5)
<i>Macro Region</i>	
Northern	23 (9.9)
Center	123 (53.0)
Southern	86 (37.1)
<i>Activities</i>	
Physicians*	47 (20.3)
Nurses	98 (42.2)
Nursing Students	87 (37.5)

*Public Health, Occupational Medicine, Legal Medicine

(First degree for 36.6% and Second level for 10.7%), while advanced training course and a Specialization course were supported by 25.9% and 12.5% of participants, respectively.

The univariate analysis gave interesting results, that are summarized below, divided into four different fields.

- A nursing role for companies (Items 8 – 12 – 13 – 14 – 17):

Item 8 was significantly associated with the macro region variable ($p = 0.014$) (Table 2).

- Utility for companies (Items 18 – 19 – 20 – 21):

Item 18 was significantly associated with variables gender ($p = 0,010$), age ($p = 0,020$) and having sons ($p = 0,043$). Item 20 was significantly associated with gender ($p = 0,003$) and item 21 was significantly associated with gender ($p = 0,001$) and macro region ($p = 0,025$) (Table 2).

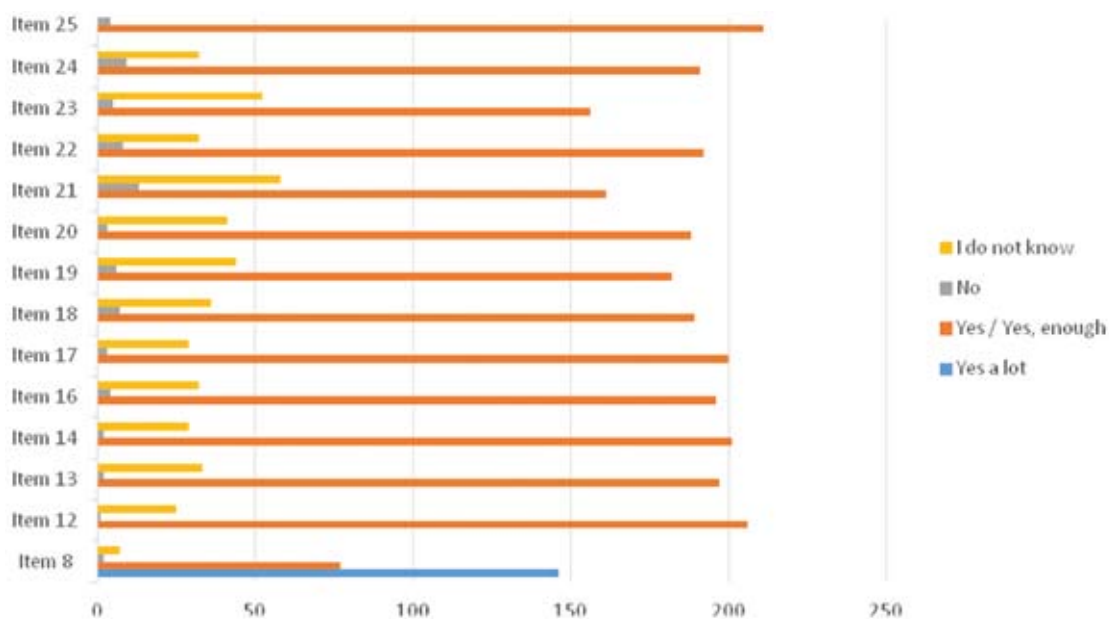


Figure 1- Frequency distribution of the main variables

- OHN's Action field (Items 16 – 22 – 23 – 24):

Item 16 was significantly associated with age ($p = 0,026$); item 22 was significantly associated with gender ($p = 0,026$) and macro region ($p = 0,036$); item 23 was significantly associated with age ($p < 0,001$), marital status ($p = 0,002$), sons ($p = 0,011$) and activities ($p = 0,016$) (Table 2)

- Education (Items 25 – 26):

Finally, item 25 was significantly associated with activities ($p = 0,018$) and item 26 was significantly associated with gender ($p = 0,039$) (Table 2).

Discussion

This study shows that the OHN is considered a key professional by most responders. In particular, analyzing the “macro-region” variable, regarding the

questions that investigate the usefulness of the OHN for health and safety in the workplace, differences were found mainly between Northern and Southern regions (questions 8 and 21). This is probably linked to a higher presence of companies and industries in the North of Italy, and consequently a greater attention to the health of employees does exist, to guarantee a continuity of the working cycle.

With regard to the need for specific training for the OHN, the students are more likely to express this need. This result must be related to question 23, which concerns the collaboration with the occupational health doctor, in which the students themselves answer “I do not know”, in more significant percentage than for all the other questions, as if to indicate a training emptiness that does not allow them to express their opinion.

Finally, regarding the postgraduate course most suited for the training of the

Table 2 - Results of the univariate analysis (shared by the four major fields)

Variable	Gender N (%)		Age N (%)		Marital Status N (%)		Sons N (%)		Macro Region N (%)			Activities N (%)		
	F	M	< 35 years	≥ 35 years	Married	No	Yes	No	North	Center	South	Doctor	Nurse	Nurse Student
<i>Item 8</i>														
-Yes, a lot	95 (61.3)	51 (66.2)	83 (59.3)		65 (64.4)	81 (61.8)	61 (64.9)	85 (61.6)	17 (73.9)	84 (66.3)	45 (52.3)	30 (63.8)	67 (68.4)	49 (56.3)
-Yes, enough	54 (34.8)	23 (29.9)	52 (37.1)	63 (68.5)	31 (30.7)	46	28 (29.8)	49 (35.5)	5 (21.7)	39 (31.7)	33 (38.4)	15 (31.9)	29 (29.6)	33 (37.9)
-No	0 (0.0)	2 (2.6)	1 (0.7)	25 (27.2)	1 (1.0)	35.1	2 (2.1)	0 (0.0)	0 (0.0)	0 (0.0)	2 (2.3)	1 (2.1)	0 (0.0)	1 (1.1)
-I do not know	6 (3.9)	1 (1.3)	4 (2.9)	3 (3.3)	4 (4.0)	1 (0.8)	3 (3.2)	4 (2.9)	1 (4.3)	0 (0.0)	6 (7.0)	1 (2.1)	2 (2.0)	4 (4.6)
<u>P-Value</u>	0.125		0.470		0.812		0.308		0.014[^]			0.541		
<i>Item 12</i>														
-Yes	134 (86.5)	72 (93.5)	120(85.7)	86 (93.5)	91 (90.1)	115 (87.7)	82 (87.2)	124 (89.9)	21 (91.3)	114	71 (82.6)	40 (85.1)	88 (89.8)	78 (89.7)
-No	0 (0.0)	1 (1.3)	1 (0.7)	0 (0.0)	0 (0.0)	1 (0.8)	1 (1.1)	0 (0.0)	0 (0.0)	(92.7)	1 (1.2)	0 (0.0)	0 (0.0)	1 (1.1)
-I do not know	21 (13.5)	4 (5.2)	19 (13.6)	6 (6.5)	10 (9.9)	15 (11.5)	11(11.7)	14 (10.1)	2 (8.7)	0 (0.0)	14 (16.3)	7 (14.9)	10 (10.2)	8 (9.2)
<u>P-Value</u>	0.060		0.166		0.627		0.441		0.186			0.604		
<i>Item 13</i>														
-Yes	129 (83.2)	68 (88.3)	115 (82.1)	82 (89.1)	85 (84.2)	112 (85.5)	79 (84.0)	118 (85.5)	20 (87.0)	111	66 (76.7)	38 (80.9)	86 (87.8)	73
-No	1 (0.6)	1 (1.3)	1 (0.7)	1 (1.1)	1 (1.0)	1 (0.8)	1 (1.1)	1 (0.7)	0 (0.0)	(90.0)	2 (2.3)	0 (0.0)	1 (1.0)	(83.9)
-I do not know	25 (16.1)	8 (10.4)	24 (17.1)	9 (9.8)	15 (14.9)	18 (13.7)	14(14.9)	19(13.8)	3 (13.0)	0 (0.0)	18(20.9)	9 (19.1)	11 (11.2)	1 (1.1)
<u>P-Value</u>	0.449		0.283		0.953		0.933		0.062			0.705		(14.9)
<i>Item 14</i>														
-Yes	134 (86.5)	67 (87.0)	122 (87.1)	79 (85.9)	86 (85.1)	115 (87.8)	79 (84.0)	122 (88.4)	20 (87.0)	108	73 (84.9)	37(78.8)	85 (86.7)	79
-No	0 (0.0)	2 (2.6)	1 (0.7)	1 (1.1)	2 (2.0)	0 (0.0)	2 (2.1)	0 (0.0)	0 (0.0)	(87.8)	2 (2.3)	0 (0.0)	2 (2.0)	(90.8)
-I do not know	21 (13.5)	8 (10.4)	17 (12.1)	12 (13.0)	13 (12.9)	16 (12.2)	13 (13.8)	16 (11.6)	3 (13.0)	0 (0.0)	11(12.8)	10(21.3)	11 (11.2)	0 (0.0)
<u>P-Value</u>	0.109		0.934		0.265		0.194		0.483			0.134		8 (9.2)
<i>Item 17</i>														
-Yes	134 (86.5)	66 (85.7)	116 (82.9)	84 (91.3)	86 (85.1)	114 (87.0)	80 (85.1)	120	20 (87.0)	108	72 (83.7)	40 (85.1)	82 (83.7)	78
-No	1 (0.6)	2 (2.6)	2 (1.4)	1 (1.1)	2 (2.0)	1 (0.8)	2 (2.1)	(87.0)	0 (0.0)	(87.8)	2 (2.3)	0 (0.0)	3 (3.1)	(89.7)
-I do not know	20 (12.9)	9 (11.7)	22 (15.7)	7 (7.6)	13 (12.9)	16 (12.2)	12 (12.8)	17 (12.3)	3 (13.0)	1 (0.8)	12 (14.0)	7 (14.9)	13 (13.3)	0 (0.0)
<u>P-Value</u>	0.454		0.180		0.706		0.643		0.809			0.299		9 (10.3)

Field 3: OHN's action field														
Variable	Gender N (%)		Age N (%)		Marital Status N (%)		Sons N (%)		Macro Region N (%)			Activities N (%)		
	F	M	< 35 years	≥ 35 years	Married	Unmarried	Yes	No	North	Center	South	Doctor	Nurse	Nurse student
<i>Item 16</i>														
-Yes	130 (83.9)	66 (85.7)	111 (79.3)	85 (92.4)	84 (83.2)	112 (85.5)	79 (84.0)	1 1 7	20 (87.0)	108 (87.8)	68 (79.1)	40 (85.1)	83 (84.7)	73
-No	1 (0.6)	3 (3.9)	3 (2.1)	1 (1.1)	3 (3.0)	1 (0.8)	3 (3.2)	(84.8)	0 (0.0)	0 (0.0)	4 (4.7)	0 (0.0)	2 (2.0)	(83.9)
-I do not know	24 (15.5)	8 (10.4)	26 (18.6)	6 (6.5)	14 (13.9)	18 (13.7)	12 (12.8)	1 (0.7)	3 (13.0)	15 (12.2)	14 (16.3)	7 (14.9)	13 (13.3)	2 (2.3)
							20 (14.5)							12
P-Value	0.126		0.026**		0.439		0.350		0.096			0.694		(13.8)
<i>Item 22</i>														
-Yes	129 (83.2)	63 (81.8)	115 (82.1)	77 (83.7)	85 (84.2)	107 (81.7)	75 (79.8)	1 1 7	20 (87.0)	109 (88.6)	63 (73.3)	33 (70.2)	85 (86.7)	74
-No	2 (1.3)	6 (7.8)	3 (2.1)	5 (5.4)	3 (3.0)	5 (3.8)	6 (6.4)	(84.8)	0 (0.0)	2 (1.6)	6 (7.0)	3 (6.4)	3 (3.1)	(85.1)
-I do not know	24 (15.5)	8 (10.4)	22 (15.7)	10 (10.9)	13 (12.9)	19 (14.5)	13 (13.8)	2 (1.4)	3 (13.0)	12 (9.8)	17 (19.8)	11 (23.4)	10 (10.2)	2 (2.3)
							19 (13.8)							11
P-Value	0.026**		0.259		0.873		0.128		0.036^			0.145		(12.6)
<i>Item 23</i>														
-Yes	99 (63.9)	57 (74.0)	82 (58.6)	74 (80.4)	74 (73.3)	82 (62.6)	70 (74.5)	86 (62.3)	19 (82.6)	89 (72.4)	48 (55.8)	35 (74.5)	72 (73.5)	49
-No	4 (2.6)	1 (1.3)	1 (0.7)	4 (4.3)	5 (5.0)	0 (0.0)	4 (4.3)	1 (0.7)	0 (0.0)	2 (1.6)	3 (3.5)	0 (0.0)	4 (4.1)	(56.3)
-I do not know	52 (33.5)	19 (24.7)	57 (40.7)	14 (15.2)	22 (21.8)	49 (37.4)	20 (21.3)	51 (37.0)	4 (17.4)	32 (26.0)	35 (40.7)	12 (25.5)	22 (22.4)	1 (1.1)
														37
P-Value	0.286		<0.001***		0.002***		0.011**		0.053			0.016^		(42.5)
<i>Item 24</i>														
-Yes	124 (80.0)	67 (87.0)	117 (83.6)	74 (80.4)	84 (83.2)	107 (81.7)	77 (81.9)	1 1 4	18 (78.3)	102 (82.9)	71 (82.6)	38 (80.9)	81 (82.7)	72
-No	5 (3.2)	4 (5.2)	4 (2.9)	5 (5.4)	6 (5.9)	3 (2.3)	4 (4.3)	(82.6)	3 (13.0)	2 (1.6)	4 (4.7)	0 (0.0)	6 (6.1)	(82.8)
-I do not know	26 (16.8)	6 (7.8)	19 (13.6)	13 (14.1)	11 (10.9)	21 (16.0)	13 (13.8)	5 (3.6)	2 (8.7)	19 (15.4)	11 (12.8)	9 (19.1)	11 (11.2)	3 (3.4)
							19 (13.8)							12
P-Value	0.147		0.598		0.216		0.970		0.111			0.331		(13.8)

Field 4: Education														
Variable	Gender N (%)		Age N (%)		Marital Status N (%)		Sons N (%)		Macro Region N (%)			Activities N (%)		
	F	M	< 35 years	≥ 35 years	Married	Unmarried	Yes	No	North	Center	South	Doctor	Nurse	Nurse student
<i>Item 25</i>														
-Yes	142(91.6)	69(89.6)	1	1	90(89.1)	121(92.4)	84(89.4)	127	21(91.3)	114(92.7)	76(88.4)	37(78.7)	91(92.9)	83
-No	3(1.9)	1(1.3)	3(3.6)	87(0)	2(2.0)	2(1.5)	1(1.1)	92(0)	1(4.3)	2(1.6)	1(1.2)	2(4.3)	2(2.0)	95(4)
-I do not know	10(6.5)	7(9.1)	1(0.7)	3(3.3)	9(8.9)	8(6.1)	9(9.6)	3(2.2)	1(4.3)	7(5.7)	9(10.5)	8(17.0)	5(5.1)	0(0.0)
P-Value	0.729		0.165		0.688		0.465		0.546			0.018[^]		4(4.6)
<i>Item 26</i>														
-Master I level	50(32.3)	35(45.5)	57(40.7)	28	38(37.6)	47(35.9)	30(31.9)	55(39.9)	11(47.8)	45(36.6)	29(33.7)	18(38.3)	34(34.7)	33
-Master II level	21(13.5)	4(5.2)	17(12.1)	30(4)	9(8.9)	16(12.2)	10(10.6)	15(10.9)	1(4.3)	17(13.8)	7(8.1)	3(6.4)	12(12.2)	37(9)
-High training/improvement course				8(8.7)										10
-Specialization	42(27.1)	18(23.4)	35(25.0)	25	23(22.8)	14(10.7)	23(24.5)	37(26.8)	7(30.4)	28(22.8)	25(29.1)	10(21.3)	28(28.6)	22
-Master's degree in an area already identified by the federation for health in the area			13(9.3)	27(2)	15(14.9)		16(17.0)	13(9.4)	2(8.7)	19(15.4)	8(9.3)	6(12.8)	13(13.3)	25(3)
-Ph.D	0(0.0)	1(1.3)	0(0.0)	16	1(1.0)	0(0.0)	1(1.1)	0(0.0)	0(0.0)	1(0.8)	0(0.0)	1(2.1)	0(0.0)	10
-I do not know	0(0.0)	2(2.6)	1(0.7)	17(4)	1(1.0)	1(0.8)	2(2.1)	0(0.0)	0(0.0)	0(0.0)	2(2.3)	0(0.0)	1(1.0)	11
-No	20(12.9)	7(9.1)	15(10.7)		13(12.9)	14(10.7)	11(11.7)	16(11.6)	2(8.7)	10(8.1)	15(17.4)	8(17.0)	8(8.2)	22
-Training course recognized at the contract level	1(0.6)	0(0.0)	1(0.7)	1(1.1)	0(0.0)	1(0.8)	1(1.1)	0(0.0)	0(0.0)	1(0.8)	0(0.0)	0(0.0)	1(1.0)	25(3)
			12	1(1.1)	1(1.0)	0(0.0)	0(0.0)	1(0.7)	0(0.0)	1(0.8)	0(0.0)	0(0.0)	1(1.0)	10
	0(0.0)	1(1.3)	1(0.7)	13(0)	1(1.0)	0(0.0)	0(0.0)	1(0.7)	0(0.0)	1(0.8)	0(0.0)	0(0.0)	1(1.0)	11
	0(0.0)		0(0.0)	0(0.0)										12(6)
P-Value	0.039[^]		0.355		0.691		0.282		0.510			0.632		0(0.0)

[^] Yates' correction

OHN, males indicate their preference about a first level master's degree, while the females opt for a high training course. For the same question, despite the variable "activity" does not result from having a significant association, it is necessary to note that all the three groups show very similar answers concerning the "1st level master".

Of similar importance is the "high training/ improvement course" answer that has the highest approval from the category concerned, nurses (Table 2).

The high number of the sample provides reliable results for the inferential statistics.

The sample is not homogeneous because it includes different professional figures, including students of the degree course who have not yet approached to work and therefore are lacking the cultural background essential for understanding the extent of the problem.

At the international level, we could see similar results. In Taiwan, Fei-Ling Wu et al., as well as Pei-Jen Chang, after noticing an improvement in the workers' health, resulting in increased production, following the introduction of the OHNs in companies, underline the need to develop an appropriate training program for this new professional figure. This training program must be part of the core curriculum of the OHN; a certification system must be established; OHN associations must be involved in ongoing training, and multidisciplinary collaborations must be reinforced (7, 8).

Randolph *et al* carried out a cross-sectional descriptive study, covering the period from 2005 to 2008, in a small group of master's students in public health at a university in the southern United States, to evaluate the skills acquired from the training program. In 2005 the authors evaluated 12 fields of expertise, divided into three levels that reflect the profile linked to the experience of the OHN: competent, profitable, and expert. Thereafter, the same evaluation was carried out in 2008. The results showed that

competences grew over time if accompanied by practice. It was, therefore sought to reset the training of the OHNs by integrating practice and research (9).

Lovan and Jones, in an interview published by the magazine "syllabus Selection", underline the importance of the practice not only for real training but - above all - to understand the extent of the problem, which in this case concerns the risks to which workers are exposed at their workplace (10). In this regard, it would be interesting to carry out a study similar to that we carried out by examining the workers themselves.

In Turkey, the youngest and least elderly country in Europe, the population has an average of 30 years and is mostly working actively. The Turkish Occupational Health Nursing Association (TOHNA) was founded in 2003, although the OHN did not have a profile and was not introduced into companies. Only in 2012 OHN was legally recognized and introduced alongside the occupational health doctor, but they did not yet have a structured study program that would make them independent, although European and American studies had already pointed out the benefits to companies, from the OHN appropriately trained (11). Unfortunately, this academic flaw persists in Turkey even if in a legal context, different from the Italian one, which recognizes the figure of the OHN (11).

In the USA, the problem of continuous training persists tough post-graduate path is already adequately well-founded and structured. A study based on the self-assessment of 128 American OHNs found that, regardless of the organizational setting in which they work, the aspect of continuous and practical training must be taken care of (12).

This should push Italians to structure a part of the specific post-graduate program focused on practice and not only on theory, as underline by the results of our study.

Finally, in Portugal, Paz and Kaiser, in 2010 carried out a descriptive study taking

as sample 9 students of a specialization course in OHN. It was emphasized that the solid educational process makes important contributions to the working context, and above all to the students who are also motivated by a world in which the demand for OHNs is always growing (13).

According to this, one can recognize that “*the change in the health system starts with health in the workplace*” (14).

Some limitations must be acknowledged. First of all, the population sample was opportunistic. However, the aim of the study was exploratory. Moreover, from the statistical point of view, we did not use correcting for multiple comparisons, and the chance of increasing the probability to find significant results could occur, but this was not the case since 16 out of 80 (20%) comparisons showed statistically significant results.

Conclusion

The study shows the need to build a training course appropriate for the new figure of the Occupational Health Nurse (15). Nowadays, in Italy, new profiles of specialization are being defined, including a curriculum characterized by post-graduate courses like I and II level masters, as well as specialization courses. The Academic institutions are, therefore, in a phase of change, which could make improvements for this emerging nursing figure, given the need to include the OHN in companies.

The training of the occupational nurse could be placed within the area of “primary care and public health” because it includes master’s programs aimed at developing skills for working in community settings, as evidently, a company may be (16).

Although this professional figure has already been established in the rest of Europe and in the USA, there is always a need to adequate his/her training (17).

Nowadays, also in America, the training of the OHN is related to masters and Ph.D. courses, but there is a need to implement the practical profile including the development of planning, prevention, and managerial skills, all aimed at ensuring constant quality in health care and prevention of health risks of workers (18).

The framework in which an OHN works must not, however, be limited to the work context (health promotion and prevention of working diseases and accidents) (19). The company in which the OHN operates could be the place where the employee faces further risks: it is not by chance that the OHN must analyze, for example, the risk of developing obesity in the employee who work in particular conditions, such as shift workers, a problem that apparently seems out of the sphere of the OHN’s competencies (20).

Acknowledgments

We really thank Prof. Gaetano Maria Fara for his valuable comments and suggestions for improving the paper. Moreover, we thank Insa Backhaus for the English revision of the manuscript.

Riassunto

L’infermiere occupazionale e il suo ruolo nella prevenzione delle malattie lavoro correlate: risultati di uno studio osservazionale

Premessa. La salute sul posto di lavoro è rimasta in Italia ancora una specialistica legata al medico. In contrasto con l’Europa, la figura dell’infermiere occupazionale non è ancora presente, a causa dell’assenza dei campi contrattuali e universitari. Il sondaggio conoscitivo è stato condotto per comprendere l’utilità dell’introduzione dell’Infermiere occupazionale nelle aziende italiane e il modo in cui le sue conoscenze possono essere investite al loro interno.

Materiali e metodi. È stato somministrato un questionario, per capire l’utilità dell’infermiere occupazionale nel nostro paese, a 232 professionisti tra cui medici legali, medici igienisti, medici del lavoro, infermieri e studenti dei corsi di laurea triennale e magistrale in scienze in-

fermieristiche ed ostetriche. Il questionario include 26 domande ognuna con una sola risposta corretta. L'analisi statistica, condotta con il software statistico SPSS, versione 25, è stata articolata attraverso l'uso di tabelle di frequenza e tabelle di contingenza. Le differenze nelle risposte dei partecipanti sono state analizzate con il test del chi-quadro e sono stati esaminati il genere, lo stato civile, la presenza di figli nelle famiglie, l'età, la macroregione e le attività professionali.

Risultati. Di 232 partecipanti il 42,2% erano infermieri, di età compresa tra 20 e 64 anni. Secondo il genere, il 66,8% delle risposte apparteneva a professionisti femminili e il 33,2% a professionisti maschili. Una bassa percentuale (9,9%) di intervistati proviene dal Nord Italia, il 53,0% dal Centro e 37,1% dal sud. L'obiettivo principale dello studio è stato identificato dalla domanda 26, con la quale è stato chiesto ai partecipanti quale fosse il corso di studi più adatto alla formazione dell'infermiere occupazionale: 85 (36,6%) partecipanti hanno risposto "master di I livello" e 60 (25,9%) hanno risposto invece "Corso di alta formazione/perfezionamento".

Conclusioni. Questo studio ha voluto evidenziare l'opinione dei professionisti sull'utilità di questa nuova figura infermieristica, proiettata nel mondo della medicina del lavoro, che supporta il medico con la sua professionalità e autonomia nella prevenzione e nel trattamento delle patologie lavoro correlate, come è stato a lungo identificato e apprezzato nel resto d'Europa.

References

1. World Health Organization (WHO). Constitution of The World Health Organization, 1948. Available on: <http://apps.who.int/gb/bd/PDF/bd47/EN/constitution-en.pdf?ua=1> [Last accessed: 2019, July 8].
2. World Health Organization (WHO). The Role of the Occupational Health Nurse in Workplace Health Management, 2001 Available on: https://www.who.int/occupational_health/regions/en/oeheurnursing.pdf [Last accessed: 2019, July 8].
3. Federation of Occupational Health Nurses within the European Union (FOHNEU) Occupational Health Nursing Education, Practice, and Profile in the EU countries. Education Group, FOHNEU, Final Report, 2012. Available on: <https://fohneu.org/images/pdf/final-report-on-OHN-education-practice-and-profile-2012.pdf> [last accessed 2019, July 8].
4. American Association of Occupation Health Nurses (AAOHN). What is occupational & environmental health nursing?. Available on: <http://aaohn.org/page/what-is-occupational-and-environmental-health-nursing> [Last accessed: 2019, July 8].
5. Lang YC. A clinical ladder for occupational health nurses. *AAOHN J* 2010; 58(6): 239-44. doi: 10.3928 / 08910162-20100526-01. PMID: 20677719.
6. Randolph SA. The Nursing Now Campaign. *Workplace Health Saf* 2018; (12): 620. doi: 10.1177 / 2165079918805768.
7. Wu FL, Tsai HM, Liou YM, Chou YF, Chang TH, Shiao SJ. Reflections on Occupational Health Nursing in Taiwan: Challenges and Perspectives *Hu Li Za Zhi* 2018; 65(2): 93-9. doi: 10.6224 / JN.201804_65 (2) .12. PMID: 29564861.
8. Chang PJ. Taiwan occupational health nursing: practices, policies and future trends. *Hu Li Za Zhi* 2014; 61(3): 29-35. doi: 10.6224 / JN.61.3.29. PMID: 24899556.
9. Randolph SA, Rogers B, Ostendorf JS. Evaluation of an occupational health program through competency achievement: on-campus and distance education, 2005 and 2008. *AAOHN J* 2011; 59(9): 387-99. doi: 10.3928 / 08910162-20110825-03. PMID: 21877671.
10. Lovan SR, Jones MS. Occupational health assessment: a tool for nursing faculty. *J Nurs Educ* 2011; 50(8): 487. doi: 10.3928 / 01484834-20110719-02. PMID: 21790105.
11. Koseoglu Ornek O, Esin MN. Occupational health nursing in Turkey: an international update. *Workplace Health Saf* 2015; 63(1): 33-8. doi: 10.1177 / 2165079914565349. PMID: 25791409.
12. Harber P, Alongi G, Su J. Professional activities of experienced occupational health nurses. *Workplace Health Saf* 2014; 62(6): 233-42. doi: 10.3928 / 21650799-20140514-03. PMID: 24971818.
13. Paz Pde O, Kaiser DE. Search by specialized training in occupational health nursing by nurses. *Rev Gaucha Enferm* 2011; 32(1): 23-30. PMID: 21888199.
14. BURGEL BJ. The future of nursing - opportunities for occupational health nursing. *AAOHN J* 2011; 59(5): 207-11. doi: 10.3928 / 08910162-20110426-03. PMID: 21534503.
15. D'Orso MI, Invernizzi I, Di Mauro S, Cesana G. Occupational health nurse's role in health surveillance and workers' education: national and

- international state. *G Ital Med Lav Ergon* 2017; **38**(4): 269-74. (Review). PMID: 29916609.
16. National Federation of Nursing Profession Order (FNOPI). (2018). Master's proposals approved 17 December 2018. Available on: <http://www.fnopi.it/attualita/universita-pronti-90-nuovi-master-per-le-22-professioni-sanitarie-oltre-30-involving-the-nurses-id2555.htm> [Last accessed: 2019, July 8].
 17. McCullagh MC. Occupational health nursing education for the 21st century. *Workplace Health Saf* 2012; **60**(4): 167-76. doi: 10.3928 / 21650799-20120328-21. PMID: 22496470.
 18. Rogers B, Randolph SA, Ostendorf J. Occupational health nursing education. *AAOHN* 2011; **59**(6): 243-6. doi: 10.3928 / 08910162-20110525-03. PMID: 21627060.
 19. McCullagh MC, Berry P. A Safe and Healthful Work Environment: Development and Testing of an Undergraduate Occupational Health Nursing Curriculum. *Workplace Health Saf* 2015; **63**(8): 328-32. doi: 10.1177 / 2165079915584127. PMID: 26077879.
 20. Tanaka R, Tsuji M, Tsuchiya T, Kawamoto T. Association Between Work-Related Factors and Diet. A review of the Literature. *Workplace Health Saf* 2019; **67**(3): 137-45. doi: 10.1177 / 2165079918812481.

Corresponding author: Prof. Giuseppe La Torre, Department of Public Health and Infectious Diseases, Sapienza University of Rome, Piazzale Aldo Moro 5, 00185 Rome, Italy
e-mail: giuseppe.latorre@uniroma1.it